

# Advanced integrated

process analysis, automation  
and control solutions



- the real implementation your process  
optimization approach, using high-technology  
solutions and advanced experience

# INTRODUCTION



Modcon was founded in 1972 and has 40-years experience in process analysis, control and optimization for production of high value and on-specification products at optimal cost and minimal environmental burden.

MODCON value proposition includes the following advanced solutions:

- Process analyzers and analyzer houses;
- Motor fuels in-line blending stations;
- Refinery process units optimization;
- Environmental protection, safety and ecology monitoring;
- Energy saving and process units efficiency optimization;
- Process control DCS solutions with total protection against cyber attacks;

Today Modcon is recognized leader and has an excellent reputation in many countries as a stable supplier of modern, reliable and competitive complete turn-key systems, designed according to the best engineering practice and technology.

Modcon team of specialists includes chemists, physicians, instrumentation and electronic engineers who responsible for each and every aspect of the project from design, approvals, purchasing, inspections, shipment, delivery, installation, training and commissioning of the entire range of equipment, supplies and consumables to operate the Turn-Key Systems. Modcon professional experience is based on the professional expertise of its engineers and practical technicians, who have been rigorously selected, trained and qualified.



## **On-line Process Analyzers and Systems** *Process Control & Automation* **SCADA and Industrial Network Solutions** *Environmental Control* **Gas Detectors and Air Pollution Analyzers**

Over the years Modcon's technical staff applies its own practical experience, in such process industries, as oil refinery, power generation, chemical and petrochemical sectors. In the last years more important place in Modcon's activities takes biotechnology, semiconductor and other high technology industries.

Modcon operates as multinational company with alignment focus on agility, resilience, flexibility to respond, ability to adapt, speed of defining and executing strategic priorities. By combining a traditional territorial focus with a focus on the informal cross-departmental networks and mechanisms Modcon looks forward to venturing into wider areas of application with new innovative products. By concentrating on our existing product portfolio, strategic expansion of our markets and a strong global orientation, we are positioning ourselves to meet the growing demands of the future.

# Turn-key projects as the way to success

## Conception building

- Complete understanding of industrial processes needs and applications
- Process control strategy development and considerations
- Technological parameters definition for measurement and control
- Development the basic strategy for process control and optimization
- Dynamic and static process mathematical modeling
- Optimization targets definition for different industrial processes and technological conditions
- Conceptual and strategic planning for process analysis, automation and advanced control

## Feasibility Studies

- Technological process description and definitions for the efficiency increase and process optimization
- Basis of design definitions and overall project summary
- Budget estimation, project direct and non-direct investments
- Procurement, contracting, project management, hazard analysis and execution summary
- Capital investment return calculations and analysis

## Financing Structure Packages

- Technical packages, risk management, hazard analysis and tax planning
- Cost-effective project financing in coordination with world financial institutions
- Long-term products sale and marketing agreements



## Engineering Services

- Conceptual design
- Basic engineering packages
- Technical specifications for equipment purchasing and procurement
- Documentation and procedures in accordance with ISO-9001:2000, ATEX, IEC and IQNet requirements

## Project Execution

- Purchasing and trade contracts with vendors, as required for the project execution
- Material management
- Equipment expediting and logistics
- Construction administration and management
- Field project control
- Budget control
- Quality assurance, safety and site security
- Start-up and Commissioning
- Testing, performance validation and acceptance
- Operators and site personnel extensive training



# Process NIR Analyzer

The Beacon 3000 is an inline, multi-channel process analyzer system. It enables non-contact, real-time monitoring and closed-loop control of physical properties and chemical composition in industrial process applications. The new Beacon 3000 represents a breakthrough in NIR process analyzer design. The intrinsically safe probe and low system cost result from a combination of innovative optics and the patented application of standard, optical, fiber technology to NIR analysis.

The Beacon 3000 is ideal for monitoring petroleum, chemical and petrochemical products. Based on novel algorithms, the Beacon 3000 measures the absorption spectrum in the near infrared (NIR) fast and accurately without labor and material waste.

The system's versatile software models enable soft-switch between different chemistries. With the capability to monitor up to eight Flow Cells in parallel, the Beacon 3000 provides an efficient, low cost per channel process monitoring. When integrated into a control system, the Beacon 3000 enables tighter process control and identifies process excursions before they affect yield.

## Features & Benefits

- The Main Analyzer is located in the Control Room, protected from the process environment. The Main Analyzer connects, via telecommunications fiber optics, to the Field Units, which are installed up to 3 km (2 miles) away, close to the process. Up to 8 Field Units can be connected to one Main Analyzer
- The Field Unit uses no electricity, and contains no moving parts. This 100% optical probe requires no explosion proof housing or analyzer shelter. The Field Unit is certified under the ATEX Directive 94/9/EC (EN 60079-28:2007)
- In many applications, the Beacon 3000's performance and price make it an attractive alternative to traditional analyzers, such as gas chromatographs or distillation analyzers. No analyzer shelter is required, and the low maintenance requirements reduce ownership costs to a minimum

## Measured properties includes :

- Motor Octane
- Research Octane
- Distillation Points
- PIONA
- API Gravity
- Cloud Point
- Flash Point
- Cetane index
- Viscosity
- Reid Vapor Pressure
- Chemical Composition
- Total Aromatics
- % para Xylene
- Total Olefins
- % meta Xylene
- Oxygenates
- Pour Point
- ortho Xylene
- % MTBE
- %Benzene
- and more ...



## Applications

- On-Line NIR Analysis of Blended Gasoline
- On-Line NIR Analysis in Continuous Catalyst Regeneration
- On-Line NIR Analysis in Crude Distillation Unit
- On-Line NIR Analysis of Diesel
- On-Line NIR Analysis in Extraction Complex

# Hydrocarbon Quality Gas Analysis System MOD-1022

MOD-1022 Hydrocarbon Gas Analyzer is a real-time hydrocarbon gas analyzer based on IR Spectroscopy measuring method. Calibrated for Natural Gas or any other HC composition, can provide real time monitoring and heating value analysis. This package is optimized for gas-phase product analysis containing C1– C6 alkane gases as typically found in natural gas pipeline and LNG.

## FEATURES & BENEFITS

- Analysis in seconds
  - Real-time, continuous measurement
  - Suitable for process control applications
  - Robust feedback control, eliminates needs for complex feed-forward modeling
- No carrier gas or fuel gas requirements
  - Low operational costs for remote and unattended use
  - Minimal infrastructure requirement, suitable for small-scale plants
- Robust calibration
  - Full hydrocarbon speciation without columns
  - <0.2% zero-drift per month
- Flow-through sensor design
  - No sensitivity to pressure and flow variations
  - Minimized potential sampling and phase change issues
- Compact, outdoor rated, low power
  - Well suited for transportable spot check applications



- Natural gas composition monitoring (distribution, storage, metering, blending, processing)
- Check metering, blend monitoring, fast-response BTU monitoring
- Natural gas based power generation (turbine, combustion engine, fuel cell)
- Fast-response alternative to traditional gas chromatograph type instruments
- LNG, Syngas, Flare
- Propylene recycle
- Acid and Sour gas
- Ethylene production
- etc

# Crude Oil Analyzer

The new MOD-4100 represents a breakthrough in crude oil on-line analysis by determination of Crude Density, Concentration of Salt, TAN, H<sub>2</sub>S/Sulfur and Water by one single analyzer system. The analyzer comes installed in outdoor stainless steel enclosure and equipped with an integral sample conditioning system.

## System Advantages

On-line analysis the quality of crude oil is important because this allows the crude to be evaluated for potential to corrode equipment and pipeline. Furthermore, as crude oil is expanding in the world's energy balance, there is an increasing need to measure with accuracy all main quality parameters such as density, concentration of salt, hydrogen sulfide and water.

The sample probe is extracted anywhere along the pipeline from well head to refinery and rapid on-line analysis allows prompt corrective action when unacceptable levels of quality parameters are present.

The Analyzer System is supplied on a basis of "Package concept" - factory inspected and tested, ready for immediate installation on-site. No analyzer shelter is required, and the low maintenance requirements reduce ownership costs to a minimum.

Measuring Ranges (selectable):

- 0-3000 kg/m<sup>3</sup> **Density**
- 0-1000 mg/L **Salt**
- 0-1000 ppm **H<sub>2</sub>S/Sulfur**
- 0-4% **Water**
- 0-1.5 mg KOH/g **TAN**

On-line Analytical System is a complete equipment set, which allows performing the following tasks in real time mode and in field conditions:

- Continuous sampling crude oil from pipeline or process vessel, its filtration and separation from solid particles
- Sample preparation for analysis of physical and chemical parameters according to specifications of analytical devices (incoming gas temperature, pressure, flow rate etc')
- Analysis of critical oil parameters, which are necessary for assessment of its quality and suitability for processing, transportation and use
- Transfer of analysis results to customer's control room by means of electronic communication



# Salt in Crude Oil Analyzer

On-line measurement of the salt concentration in crude oil plays an important role in the crude oil chain, from the well head until entering the crude distillation unit. The MOD-4100S is an on-line salt in crude oil analyzer, which is designed to provide real time analytical data of the salt content in crude oils. Its technology is based on ASTM D 3230, an electrometric method. This method determines the salt concentration in crude oil by measuring its conductivity, when dissolved in a mixture of an aromatic and an alcoholic solvent.

## ADVANTAGES

- Provides online critical data of crude oil qualities
- Provides on-line data about the salt content at the oil-well head
- Provides on line data of the salt content prior and after shipment
- Provides on-line data of the salt content prior and after blending
- Provides on-line data of the salt content before entering the desalter
- Indicates the desalter efficiency.
- Allows on-line optimization of the desalter process conditions.
- Reduces water, chemicals and energy consumption in the desalters.
- On-Line information of the salt content of crude oil crude oil entering the CDU
- Reduces Corrosion, preventing plugging and fouling of pipelines.
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## PRINCIPLE OF OPERATION

The analytical procedure starts with sampling of the process stream and bringing a well defined quantity of the sample into the analyzer's measuring cell.

This is fully automatically and accurately performed by an electronic system that controls a set of precise pumps and valves.

An accurate amount of a sample of crude oil is brought into the measuring cell. Precise volumes of solvents are accurately added to the cell content and mixed with the sample.

The salt concentration is determined by measuring the conductivity of a the crude oil sample dissolved sample in fixed amount of diluents.

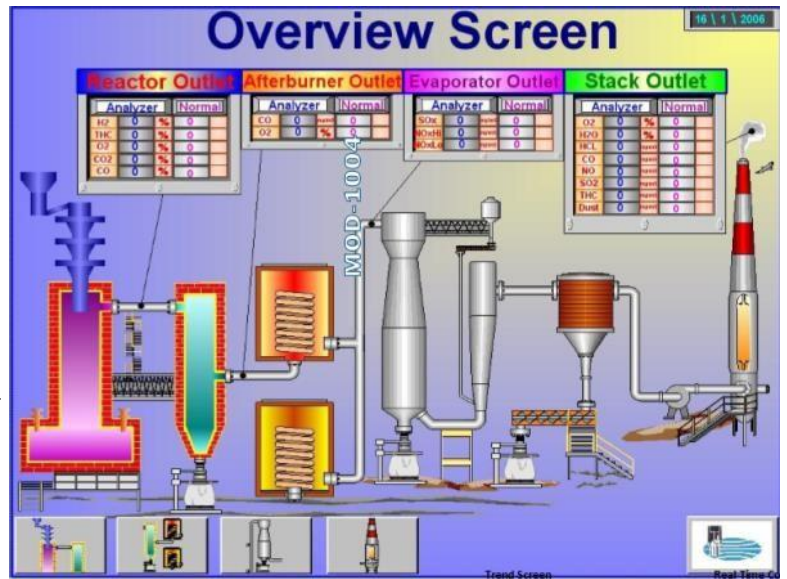
When the measurement are terminated, the cell content is discarded, and the system flushes rinses and cleans itself automatically.

# Multi-Component System for Continues Emission Monitoring

MOD-1002, Continuous Emissions Monitoring System is complete measuring system with analyzers, sample conditioning and data acquisition incorporated within the single cabinet. The system based on FTIR measuring technology and includes advanced sample conditioning assembly to produce accurate and reliable and simultaneously measurement of multiple components like: NH<sub>3</sub>, CO, CO<sub>2</sub>, HCl, HF, NO<sub>2</sub>, NO, SO<sub>2</sub>, CH<sub>4</sub> and many others.

MOD-1002 features robust quantitative analysis software, which can analyze and report concentrations for dozens of compounds simultaneously.

The software, which operates on a personal computer, performs automatic corrections for gas temperature and pressure variations, which are measured directly by the analyzer. Samples can be acquired and analyzed in less than a second, making transient analysis possible.

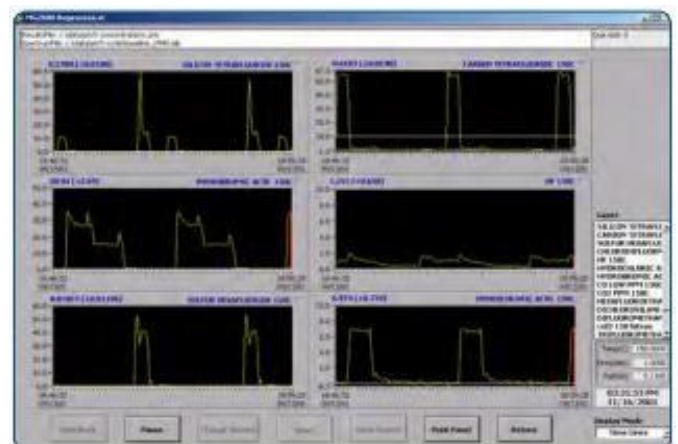


- 10-100 ppb sensitivity for many toxic gases
  - Including VOCs, acids, bases, hydrides, and PFCs
  - In effluent streams that contain up to 40% water
- Easily transportable from site to site, with set up time in minutes
- Simultaneous analysis and display of more than 30 gases
- Permanent calibration spectra reduces the need for costly gas cylinders

- Gas line heater maintains temperature before the sample enters gas cell
- Patented, linearized detector response assures all instruments maintain the same calibration
- Frequency and resolution diagnostics ensure constant calibration
- Provides automatic temperature and pressure compensation to ensure accurate analysis
- User-friendly software enables simple operation by minimally trained personnel

## APPLICATIONS

- Stack monitoring (environmental compliance)
- Process monitoring, development and optimization
- Ambient air analysis (industrial hygiene)
- Bulk gas purity analysis
- Combustion emissions monitoring
- SCR - selective catalytic reduction performance monitoring





# Gas Detectors Series

Gas alarm MOD-7100 MOD-7200 series is a new generation of infrared, catalytic, and electrochemical sensors, specially designed for installation in hazardous and extreme environments. High accuracy and ease of use are provided with advanced technology, compact design, wide operating voltage range and reliability.

## Key Applications:

- Petroleum refining
- Petrochemistry
- Chemical industry
- Gas Industry
- Underground facilities
- Pharmaceuticals
- Air quality in the laboratory and in enclosed spaces



MOD-7100

## Key Features:

- Compact and robust design
- User-friendly operator interface with a hand magnet
- Intelligent sensors are interchangeable, based on different technologies
- Option on the bright display, contact outputs, stainless steel and hand-configurator



MOD-7100

## Available Options:

- Light signaling
- Audible alarm
- Infrared communication channel
- Low temperature operation
- Communication protocols HART, CAN, RS-485
- A variety of control modules
- 2, 3 or 4-wire connection



MOD-7300

## Flammable Detectors Series

Optical measurement method UV \ IR



MOD-7200

## Sensors Type Available:

- Infrared technologies
- Catalytic technologies
- Electrochemical technologies
- Metal Dioxide technologies
- Photo Ionization technologies



MOD - CONTROL



# On-Line Water In Oil Analyzer MOD-4400

The MOD-4400 has been developed to measure on-line the moisture content in fuels and petroleum liquids, flowing through pipe lines. Its principle is based on Radio Frequency Dielectric Sensors Technology, sensing by VHF radio waves and using dielectric properties.

The MOD 4400 moisture analyzer is equipped with flanges, to enable easily incorporation into a pipe line. The analyzer and flanges can be delivered in different sizes. The MOD 4400 is applicable to measure moisture in fuels and petroleum products. The sensor is made as a pipe section with flanges of stainless steel. The probe inside the pipe made of stainless steel with a flat topped U-form shape. The probes and incorporated temperature sensor, are connected to its control unit to accurately determines the moisture content of the liquids passing through the sensor pipe. The control unit can be placed at a distance of up to 1000 m away from the measuring probe.

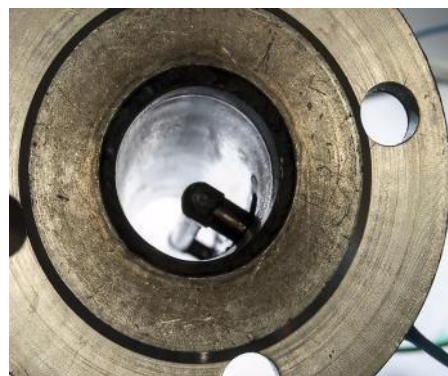


## FEATURES

- All 316 stainless construction
- 1 inch to 48 inch Bore sizes
- IP 66 Enclosure
- Process temperature work ranges  $-20...+120^{\circ}\text{C}$
- High Process temperature sensors work ranges  $-20...+190^{\circ}\text{C}$
- Ambient temperature down to  $+85$  down to  $-60^{\circ}\text{C}$
- Accuracy at  $0.02+0.025*W$  of the volume of water
- User-definable ranges 0-1% , 0-3%, 0-10% and 0-25% cut (other non standard ranges are user selectable e.g 0-4%)
- Measurement response time - 1 second
- Loop-powered (2-wire) or 24 V DC
- Built-in temperature compensation
- Works with any type of oil
- Measurement of the stainless steel
- The complete definition of the water content
- Immediate response to changing conditions
- Excellent long-term stability and the absence of drift
- The possibility of on-site calibration
- Easy and reliable

## APPLICATIONS

- » Crude oil BS&W measurements
- » Emulsion Control
- » Aviation Fuel
- » Petroleum by-products
- » Desalters
- » LACT units
- » Dewatering
- » Oil Quality Control
- » Oil Water Separator Vessels
- » Wash Tank Effectiveness
- » Free Water Knockouts
- » Heater Treaters
- » Separation Vessels
- » Hydrocarbons



# SCADA and Network Security

Modcon Systems offers a diverse range of pipeline automation services utilizing the latest proven technologies. Modcon SCADA provides robust, scalable, user friendly and nonproprietary solutions that seamlessly can be integrated into existing platforms and systems. The solution focuses on all the crucial factors like pipeline product quality, control system flexibility and leak detection traceability, low system maintenance and pipelines performance, and regulatory compliance during all the phases of a project - from the initial design development to the installation and to future expansions.

Pipelines transport all kinds of liquids and gases such as: gasoline, crude oil, diesel fuel, natural gas, water, sewage, and hazardous materials. There are a very exact definitions and needs to control the pipeline process specification, which includes transferred product quantity and quality, to guarantee the delivery agreements are exactly observed.

A leak or spill from these pipelines could threaten neighborhoods, contaminate water supplies, or pollute environmentally-sensitive land. Pipeline companies are faced with the growing need to protect their assets from different kinds of malicious activities, ranging from simple theft to terrorism. The system is designed to allow their pipeline controllers, in a centralized control room, to efficiently and effectively monitor and control pipeline operations in real time.

The system includes the following main components:

- Field instrumentation for quantitative measurements and control
- Pipeline security system for real-time control of activities around the perimeter and on the pipelines
- Radio, satellite, fiberoptic or cellular communication network to acquire field data to control room SCADA master station which allows operator to view current or historical data, alarm messages, and issue controls to field equipment
- On-line Analyzers for petroleum products quality determination and control



## Smart Thinking THIS WAY

**Pipeline companies use Modcon SCADA systems** to allow their pipeline controllers, in a centralized control room, to efficiently and effectively monitor and control pipelines, pump stations, filling terminals operations in real time. Data is collected from field instrumentation and Product Quality Modules by remote terminal units (RTUs), flow computers, and/or programmable logic controllers (PLCs) which then relay the information to the SCADA master station via the deferments field communication networks.

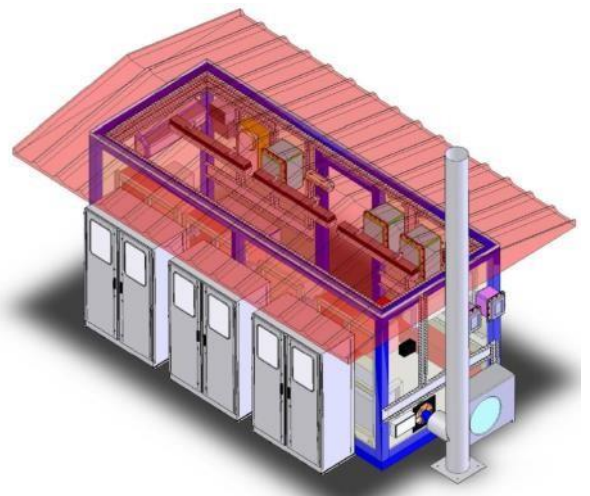
The SCADA operator station performs any required data conversions, intermediate calculations, checks for unusual conditions which should be brought to the attention of a pipeline controller, and stores data for viewing, long-term archiving, and for use by advanced applications and open Field Bus protocols. Pipeline controllers interface with the SCADA operator/monitoring station through the graphical user interface (HMI) which allows them to view current or historical data, alarm messages, and issue controls to field equipment.

**Modcon Pipeline SCADA systems** cover a broad range from small to huge, relatively simple to very complex, and important to extremely critical for both financial and safety reasons. A small SCADA system may be comprised of a local control/monitoring station, which also supports the HMI Station, to handle a few hundred points in a non-critical environment. A large SCADA system may be comprised of triple-redundant sets of servers and Hybrid-Controllers, in a distributed configuration, spread out over multiple geographic locations along with numerous multi-headed HMI workstations, support staff, and management. Factors such as point count, data acquisition rates, and availability (up-time) requirements determine the size, complexity, and redundancy of the pipeline control system.

# Smart Analyzer Houses

**Modcon Smart Analyzer Houses** are versatile enough to accommodate virtually any combination of required analyzers, sample conditioning systems and analyzer management systems.

Modcon provides complete integrated analyzer systems and all related services from initial engineering through manufacturing, testing and field start-up. Analyzers Systems are normally supplied installed in the special Analyzer Houses including air-conditioning, power distribution, lighting, termination and junction boxes, gas and flame detection, relevant piping and wiring. Process sample probes and sample transport lines designed to ensure representative and rapid sampling, avoiding a possibility of contamination or dead volume. Sample Conditioning systems to provide the sample in a state and condition compatible to the measurement technique used by analyzers. Sample recovery systems, stream selection facilities, telephone modem connections, furniture, special equipment and tools, etc.



## Complete Analyzers Systems are normally equipped with the following main facilities:

- Analyzer Houses including air-conditioning, power distribution, lighting, termination and junction boxes, gas and flame detection, relevant piping and wiring
- Process sample probes and sample transport lines designed to ensure representative and rapid sampling, avoiding a possibility of contamination or dead volume
- Sample Conditioning systems to provide the sample in a state and condition compatible to the measurement technique used by analyzers
- Sample recovery systems, stream selection facilities, telephone modem connections, furniture, special equipment and tools, etc.

The electrical classification and safety of analyzer shelters, process instrumentation and interface equipment is a subject of great importance, since the most of petrochemical process locations has been determined as a hazardous area.

The choice of proper equipment and protection methods initially involves determination of the nature of the hazards at the location.

Modcon applies all available methods of protection, such as intrinsic safe, flameproof, pressurization, encapsulation, increased safety, powder filling, oil immersion, etc.



# IIoT in Petroleum Industry and Big Data Management

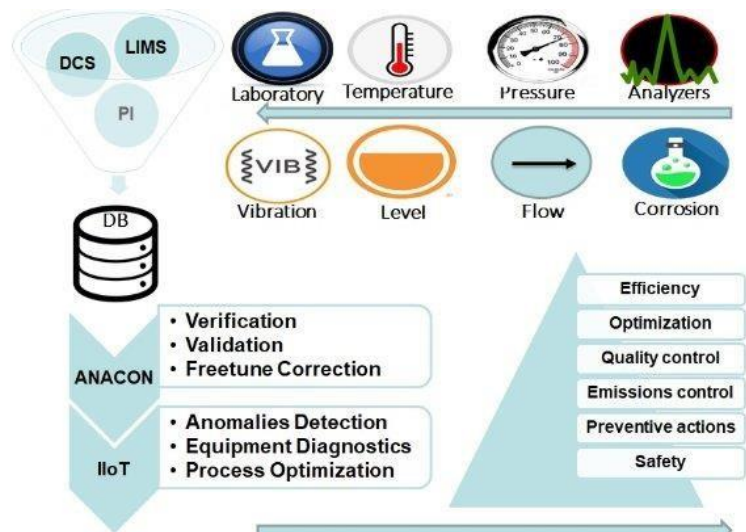
The worldwide refining industry has undergone a major transformation in the last decade due to changes in regulatory and market forces, such as fluctuating crude prices, tighter regulation on product quality and refinery emissions, shifting crude quality and fundamental changes in fuel demands. At present, refineries must be flexible enough to respond immediately to crude oil changes and deviations in product demands as a result of the changing global economy. The required flexibility in the management of a refinery can be achieved by direct monitoring of the physical properties and chemical composition of the product streams in each refinery unit.

To increase the margin, the refinery can (1) reduce feedstock costs, (2) decrease operating expenses and (3) increase product revenue. Targeting these main ROI

criteria, Modcon launches novel solution, which is based on remote process analysis technology powered by big data IIoT functionality:

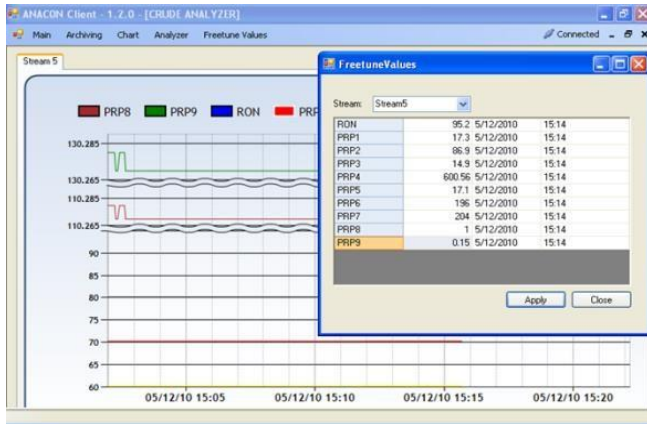
1. Remote process analytics (RPA) provides a solution for safe and accurate measurement of physical properties and chemical composition by using a NIR process analyzer based system. The concept of this technology allows the analyzer to be connected by standard telecommunications fiber optics to a multiple set of different field units. These field units are installed at a distance of up to 3 km from the analyzer, close to the process. The measuring probes are free of electricity, without moving parts, and without any material able to generate static electricity.
2. ANACON software centralizes on-line real time and historical analytical data from process analyzers and field instrumentation, establishing the connectivity between the multiple systems (DCS/PI/LIMS, etc.), based on OPC communication. To maintain the highest accuracy of the analytical data provided, constant verification and validation of analyzer/instrumentation readings against laboratory/reference results is maintained, which reduces the need for ongoing maintenance and fine-tune of the calibration model, without affecting the accuracy of parameter to be measured.
3. Once physical properties and chemical composition data has been verified against laboratory results, ANACON can point on measuring devices, which requires attention, calibration and/or repair. Only after successful verification and validation of process data, ANACON performs big data analysis, looking for anomalies and their location in the process. Big data functionality includes multidimensional fusion and distribution of incoming data, abnormality of novel events detection, clustering, decision trees, linear, polynomial, logistic regression, escalation of novelty real-time analysis, etc.

The outcome of efficiency in this novel solution implementation is a noticeable reduction in operation costs, without affecting the production capacity or product quality. By that, the refinery increases its revenue, its profit and its economic growth. This enables the refinery to stand firm against any undesired influences which are caused by geopolitical and highly competitive economic environment. By combining process knowledge, remote analysis technologies and big data analytics power, ANACON-IIoT solution s driving unprecedented levels of efficiency, productivity, and performance.



# ANACON-Analyzer Management & Control System

**Wide range** of process analyzers are being used nowadays in modern industry. These Analyzers delivering measuring results and status information to the DCS but different communication standards and operation philosophy of these analyzers makes this operation complicated. Successes that can be attributed to the use of process analyzers includes remote monitoring, validation and maintenance of the analyzer systems in one single tool.



## Benefits using ANACON

- Monitor and Control a wide range of analyzers
- Graphical Display of the data from multiple analyzers
- Provide Historical Data on analyzer performance
- Manage Validation Procedures according to ASTM D3764
- Self Calibration FreeTune mechanism
- Control Active Streams
- Alarms Management
- Remote Maintenance
- Multilingual Support

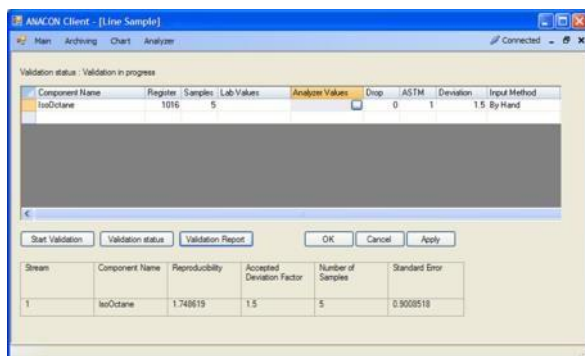
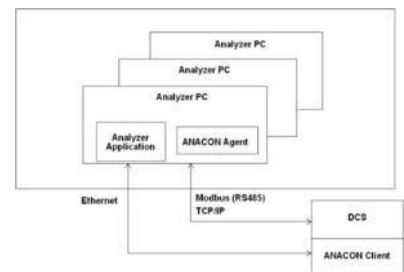
## ANACON Software Features

**ANACON** is a full-distributed Analyzer Management and Control System that was developed to provide more efficient tools for maintenance calibration and validation of the analyzer systems. It was configured to be connected to remote systems using communication links like TCP/IP or RS-485. **ANACON** was developed to be running on Microsoft Windows platform.

**ANACON** is able to monitor the operating state of the installed equipment and validate a wide variety of analyzers and instruments. Once an analyzer or instrument is validated, **ANACON** will evaluate and register the results using statistical rules.

## Graphical Display and Maintenance Tools

- Graphical display tool from the multiple analyzers provides not only on-line information but also allows viewing historical data which is archived automatically upon configuration
- Maintenance tool based on a PcAnywhere platform allows remote access to the appropriate analyzer's GUI for remote maintenance and calibration procedures.



## Analyzer Validation

ANACON software supports two validation methods according to ASTM D3764:

**Reference Sample Method** – mostly used for laboratory Analyzer validation while previous laboratory measured sample is introduced to into the analyzer.

**Line Sample Method** – while historically obtained analyzer results are compared with laboratory analysis using the appropriate ASTM or other test method.

# In-Line Blending Systems

An integrated gasoline and diesel in-line blending system, with automated in-line blending system, optimization software and on-line analyzers, produces real-time on-spec blends that can send product directly to pipeline, tank or ship.

## Blend Optimizer Functions

- Simultaneously control of the blend qualities specified by the grade
- Calculation of initial blend ratios
- Tank heel correction
- Quality integration in the target tank using on-line analyser measurements (Product certification)
- On-line analyser validation and control
- Check component availability
- Alarming
- Operator guidance in case of infeasible operating conditions
- Reports: set-up and historical (End of Blend)
- Offline package to prepare blends and carry out 'what if' analysis



## Process Analyzers

Online blending analyzers at the blend header are used for feedback control and product certification, which necessitates consideration of the relevant organizational aspects of the operations, analyzer technicians, and laboratory departments.

Online blending analyzers that use samples obtained from the finished blend header are used for feedback control and product certification. Implementation of these analyzers requires consideration of the production operations with the analyzer technicians along with fully collaboration of the site laboratory. Modcon has an extensive experience of more than 30-years in petroleum process analyzers and provides complete analyzer solutions, including sample conditioning, analyzer shelters, installation and training .

## NIR Analyzer

Located in the control room and connected via telecommunication fiber optics (up to 3 km) to the Field Units (up to 15 sensors), installed anywhere in the process or on blending collectors. Models updating is made by using of Free-tune Software for higher accuracy and low maintenance

## Crude Oil analyzer

Does not have the continual model maintenance issue caused by spectral changes seen with crude composition changes. Additional key advantage is linear spectral response across a broad range which enables models to be extrapolated accurately.

## Fusion Solutions

Discrete Analyzers and/or their combination with NIR and NMR Analyzers for auto-validation and products on-line certification.



# Sample Conditioning Systems

**Process sample probes and sample transport lines** designed to ensure representative and rapid sampling, avoiding a possibility of contamination or dead volume. Sample Conditioning systems to provide the sample in a state and condition compatible to the measurement technique used by analyzers.

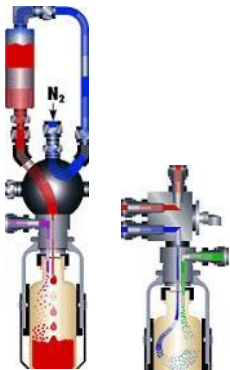


**The Sample Recovery System offered by Modcon designed to collect spent sample from on-line process analyzers and periodically return this sample back to the process lines**

- 100 liter tank available in Stainless Steel
- Tank is equipped with sample connection to allow hook-up from one or more analyzers
- Tank is equipped with magnetic level switches to control float
- As liquid level is reached, turning the sample pump "on"
- As liquid is pumped out of the tank, the preset level is reached and the pump shuts down
- Atmospheric vent for gas/vaporized sample releasing
- Overflow vent for safety
- Pump that achieves up to 130 PSI at its discharge
- Pump bypass line equipped with relief valve to prevent overflow in the outlet line

## Closed loop sampling systems

The LPG sample systems enable operators to obtain samples of liquids with high vaporization pressures. Sample is captured in a sample cylinder for easy transportation to the lab. Texas Sampling cylinder saddles help ensure proper alignment and prevent leakage when connecting the cylinder. The cylinder is safely secured to the plate by the saddles. For maximum operator safety, our design allows the operator to maintain the proper outage. Excess sample left in the system is also vented so that the pressure in the quick connects is reduced.



The demonstration illustrates the Sample Mode of the TSI3 Fixed Volume Sampling System. There is also [a Bypass and Vent Mode](#) demonstration for this sampling system. When process sample pressure is too high, or the application calls for a fixed amount of sample, the fixed volume sampler is a perfect selection. By turning one valve, you can isolate sample pressure, purge sample bottle before dispensing, and verify purge flow. Internally, our valve combines four different functions. A specific amount of sample is captured in a fixed volume chamber and blown down into the sample container with low pressure nitrogen.



**Our LPG sample systems** enable operators to obtain samples of liquids with high vaporization pressures. Sample is captured in a sample cylinder for easy transportation to the lab. Texas Sampling cylinder saddles help ensure proper alignment and prevent leakage when connecting the cylinder. The cylinder is safely secured to the plate by the saddles. For maximum operator safety, our design allows the operator to maintain the proper outage. Excess sample left in the system is also vented so that the pressure in the quick connects is reduced. Simple operation and easy on / off design of the sample cylinder make our system a good choice for any high vaporization liquid or

**Manual Continuous sample system** is a closed loop liquid sampler that satisfies many sampling needs. This system will take emission free, representative samples of process while providing operator safety. Our patented valve design ensures zero dead volume throughout the sample valve assembly. Easy to install and operate, process pressure is used to dispense the sample into the sample bottle.







**MODCON**

*SYSTEMS LTD*



## MARS

Modcon Advanced Remote Service

Capitalize on a new dimension in system support

### **Modcon Service and Maintenance Agreement Offering**

Process analyzers play today an important role in refinery and petrochemical processes control and optimization. Success in their implementation significantly depends on close attention to maintenance and ongoing technical support. Customer service is the primary function of the support packages offered by MODCON, providing our customers with best practice services, level of knowledge and professionalism. In order to provide expert service to its process analyzer systems users, Modcon offers a comprehensive technical support and maintenance program. The program's objective is to provide the resources to keep the complete customer's System on line with minimized down time.

## Skilled staff and 40 years experience put to work for your company

Wide range of process analyzers are being used nowadays in modern industry. These Analyzers delivering measuring results and status information to the DCS but different communication standards and operation philosophy of these analyzers makes this operation complicated. Successes that can be attributed to the use of process analyzers includes remote monitoring, validation and maintenance of the analyzer systems in one single tool.

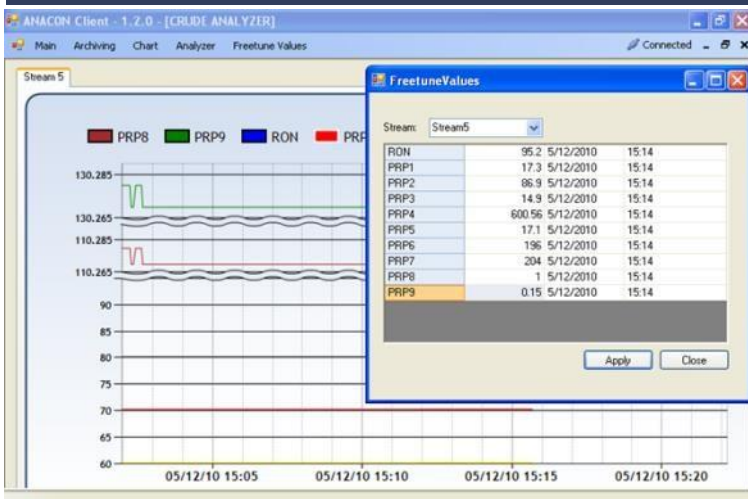
## We work with your system to insure that your business requirements are achieved

**ANACON** is a full-distributed Analyzer Management and Control System that was developed to provide more efficient tools for maintenance calibration and validation of the analyzer systems. It was configured to be connected to remote systems using communication links like TCP/IP or RS-485. **ANACON** was developed to be running on Microsoft Windows platform. **ANACON** is able to monitor the operating state of the installed equipment and validate a wide variety of analyzers and instruments. Once an analyzer or instrument is validated, **ANACON will evaluate and register the results using statistical rules**

## Deployment and support services are part of each

### Graphical Display and Maintenance Tools

Graphical display tool from the multiple analyzers provides not only on-line information but also allows viewing historical data which is archived automatically upon configuration. Maintenance tool based on a PcAnywhere platform allows remote access to the appropriate analyzer's GUI for remote maintenance and calibration procedures.



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**TARGET**

Advanced Remote Service

[www.modcon-systems.com](http://www.modcon-systems.com)

# ANACON Analyzer Management & Control System

- Monitor and Control a wide range of analyzers
- Graphical Display of the data from multiple analyzers
- Provide Historical Data on analyzer performance

# ANACON SERVICES & BENEFITS

## Multilingual Support

Monitor and Control a wide range of analyzers

Graphical Display of the data from multiple analyzers

Provide Historical Data on analyzer performance

Manage Validation Procedures according to ASTM

Self Calibration FreeTune mechanism

Control Active Streams

Alarms Management

Remote Maintenance

| SUPPORT FEATURE   | BASIC | ADVANCED | PREMIUM |
|---|-------|----------|---------|
| <b>24/7 global telephone support</b><br>Modcon will provide access to our global technical support call center in 24 hours per day, seven days per week. Incoming calls will be processed and responded to in a timely manner by authorized operators and then forwarded to Modcon engineers and technicians, offering a comprehensive level of technical expertise.  | ↕     | ↕        | ↕       |
| <b>Email support via a global tracking system</b><br>Email support is the most effective method of assistance for troubleshooting and correcting analyzer system problems, offering rapid issue resolution. Response time during business hours will be within two (2) hours of initiation of incident report by system user.   | ↕     | ↕        | ↕       |
| <b>Warranty and returns</b><br>Modcon products are warranted against defects in material and workmanship for a period of one year from date of shipment. During the warranty period, Modcon will repair or replace products which are defective in accordance with terms and conditions of purchase order.  | ↕     | ↕        | ↕       |
| <b>Remote technical support services</b><br>Technical support provided via internet and modem is the best method of assistance for troubleshooting and correcting control system problems. Please note that this will require a functional dedicated internet connection or telephone line installed in the control room at the customer site of sufficient line quality to facilitate dial-in modem connection access. | ↕     | ↕        | ↕       |
| <b>Web knowledge base for registered users</b><br>Access to Modcon's web knowledge base that enables registered users online access to a repository of technical data including a topical database of operation, problem solving and troubleshooting of Modcon systems.   | ↕     | ↕        | ↕       |
| <b>Hardware upgrades</b><br>Special conditions for hardware upgrade and associated services   | ↕     | ↕        | ↕       |
| <b>Unscheduled calls and emergency on-site services</b><br>Emergency calls will be responded within 24 hours and charged at a standard service rate of 1,000 USD excluding travelling and per diem expenses   | ↕     | ↕        | ↕       |
| <b>Models maintenance and validation</b><br>The fine tuning of the models will be carried out via internet or modem with the Customer's full cooperation in sending lab results and connecting to the system's modem  | ↕     | ↕        | ↕       |
| <b>Software upgrades</b><br>An active maintenance contract providing upgrades to the latest versions of Modcon software   | ☐     | ↕        | ↕       |
| <b>Scheduled on-site annual visits</b><br>Modcon expert will visit the customer plant site once per year, for a duration not to exceed three (3) days to perform a comprehensive system check and review system functions with the operations and maintenance staff   | ☐     | ↕        | ↕       |
| <b>Preventive on-site maintenance</b><br>Modcon will be responsible for preventive analyzer system maintenance on-site  | ☐     | ☐        | ↕       |



# MODCON SYSTEMS LTD

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