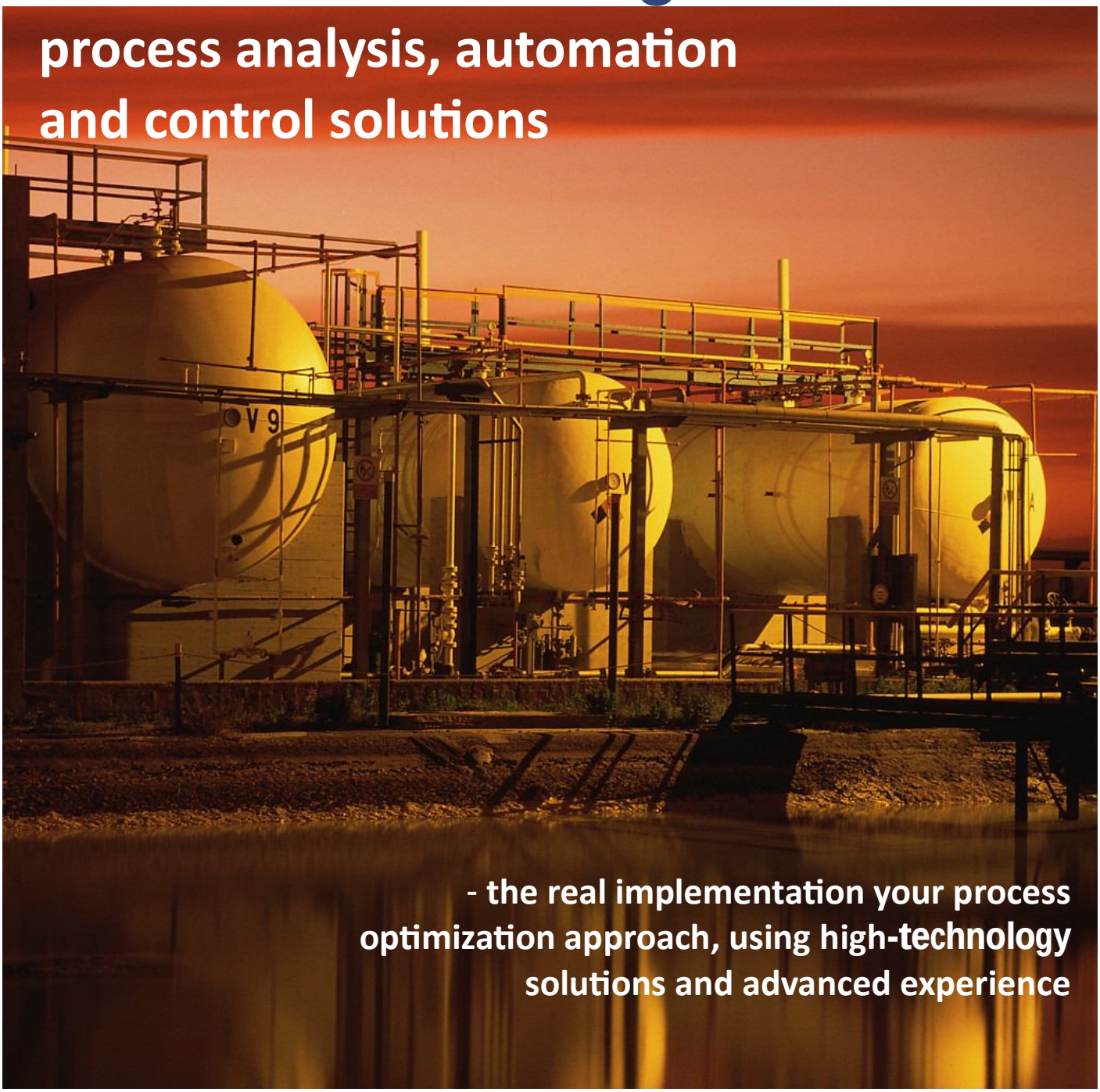
MODCON
SYSTEMS LTD

Advanced integrated

process analysis, automation and control solutions



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

INTRODUCTION

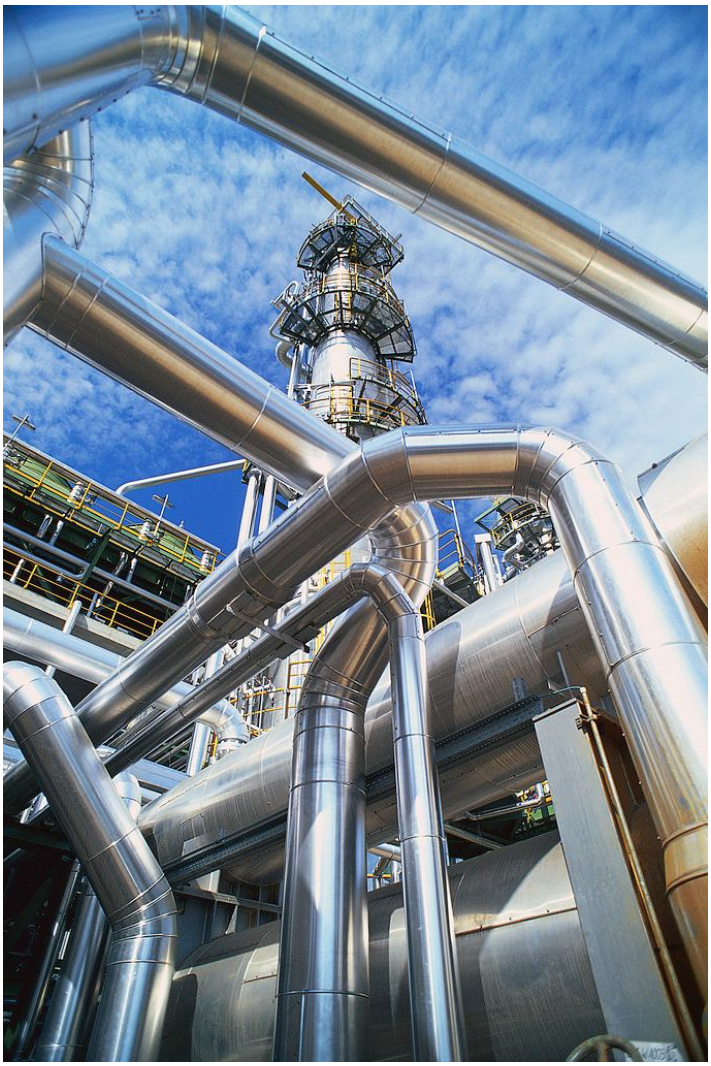
Modcon was founded in 1972 and has 40-years experience in process analysis, control and optimization for production of high value and on-specification products at optimal cost and minimal environmental burden.

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 NMR Analyzer

The MOD-8000 online process analyzer is designed to analyze the composition of process fluids. Using Magnetic Resonance (MR) spectroscopic techniques, it can detect the presence and the concentration of chemical constituents in a process stream. By utilizing exclusive software, it provides closed loop supervisory control of a process unit. It has an extensive range of applications from light Naphtha streams to heavy Crude oil. Typical user benefits comprise increased throughput, better process control, timely detection of off-spec product, and lower operating costs.

Highlights of the New System

- New magnet design (enhanced long and short term stability; less sensitive to temperature)
- State of the Art electronics (Smaller foot-print; Complete integrated PCB for Shim & Heater Control; Digital RF & Acquisition - improve SNR)
- New concept of Process Probe (An entire pipe go thorough without contact with the system; Much better temperature insulation; Higher Q i.e. better sensitivity)
- New Software (Includes new algorithm for standard and global Models; Fully automated process capacity; Extensive remote diagnostic capabilities)

System Key Advantages

- Real time, continuous **flow-through** stream analysis
- Provides chemical and physical analysis in **dense** and opaque materials
- **Multi-variable** analysis from a single instrument and a single sample
- **Linear Spectral Response** across broad range; models can be extrapolated accurately
- Stable, homogeneous magnetic field, **no fringe field**
- **Minimal maintained** achieved by using no-moving parts
- **Built-in reference** for measuring chemical shifts of all process components
- **Automatic shim control** ensures uniformity of magnetic field during measurement
- **Built-in manifold valves** provide convenient purge, drain, and vent connections for cleaning sample line
- **Local and remote** system display, operation, and supervision

Integrated Application Solution

- The analyzer, sample conditioning system, analyzer house and follow-up support are all provided by Modcon Systems LTD.- one supplier for the entire package
- The MOD-8000 MRA analyzer, combined with advanced control tools, provides a turnkey, engineered solution for a process control improvement task
- MRA chemometric models are available for specific process applications. All are designed and field tested to meet the operating goals of the particular process, such as to maintain product quality, maximize yield, and enhance feedstock flexibility

APPLICATIONS

- Gasoline Blending
- Diesel Fuel Blending
- Fuel Oil Blending
- Naphtha Cracking
- FCCU Feed
- FCCU Distillates
- Sulfuric Acid Alkylation
- Crude Switching/Blending
- Catalytic Reforming
- CDU Distillate

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

Crude Analyzer

The new MOD-4100 represents a breakthrough in crude oil on-line analysis by determination of Crude Density, Concentration of Salt, Hydrogen Sulphide 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 sulphide 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^3 Density
- 0-1000 mg/L Salt
- 0-1000 ppm H2S
- 0-4% Water

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

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.

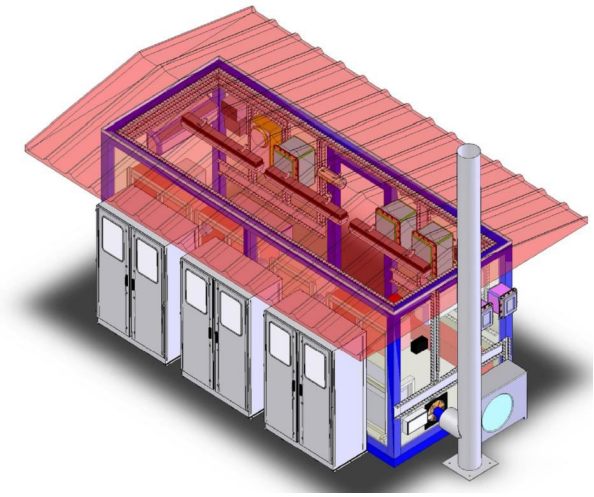
The SCADA operator station performs any required data conversions, intermediate calculations, checks for unusual conditions which should be brought to the attention of a pipeline controller, and stores data for viewing, long-term archiving, and for use by advanced applications and open Field Bus protocols. 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.

ANACON-Analyzer Management & Control System

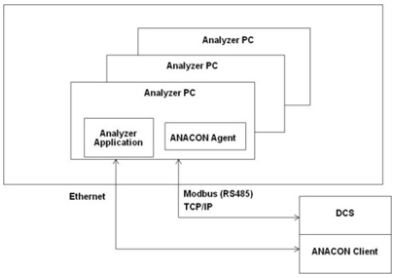
Wide range of process analyzers are being used nowadays in modern industry. These Analyzers delivering measuring results and status information to the DCS but different communication standards and operation philosophy of these analyzers makes this operation complicated. Successes that can be attributed 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

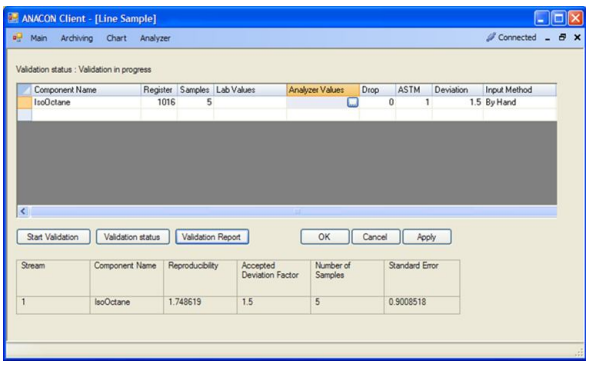
ANACON Software Features

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

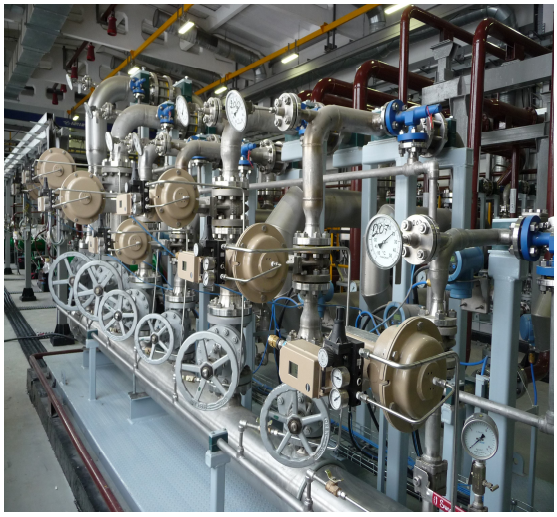
ANACON software supports two validation methods according to ASTM D3764:

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

NMR 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.

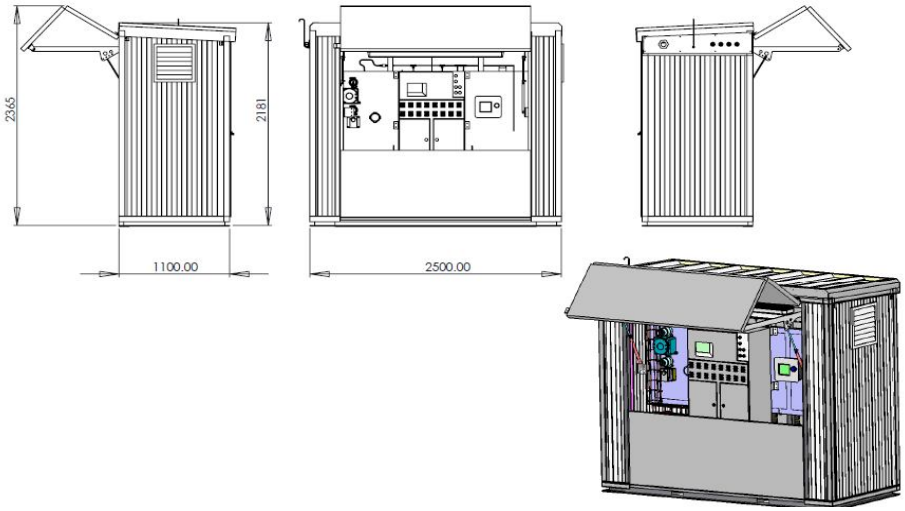
Natural Gas Quality Analysis

The MOD-1022 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 of gas from pipeline or process vessel, its filtration and separation from accompanying impurities (solid particles, salts, oils, aerosols of liquid hydrocarbons, glycols, amines etc')
- 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 gas parameters, which are necessary for assessment of its quality and suitability for processing, transportation and use
- Transfer of analysis results to customer's gas processing facility control room by means of electronic communication
- Automatic gas leak detection and indication of dangerous gas concentration levels in Analyzer house

The system includes following main components:

- On-line gas-chromatograph, hydrocarbon dew point, water dew point and H2S analyzers
- Sampling system, including high-pressure gas probes for taking samples from pipelines and process vessels, membrane filters-separators for gas separation from liquids and aerosols, absorption filter-scrubbers for glycols and amines, pressure regulators, release valves, flow meters and flow regulators, 2- and 3-way valves and tubing – all made of SS-316
- Weather-proof analyzer housing for accommodation of all major System components and providing suitable working conditions according to their specifications
- Electrical infrastructure, including main power switches, power distribution boards to analyzers and to peripheral equipment (lighting, heating, AC), signal terminal box, light switch, armored cabling – all Ex-proof






MODCON SYSTEMS LTD

Registered in England and Wales with company number 3838753

Suite 1674, Lower Ground Floor, 145-157 St John Street, EC1V 4PW
T/F: +44 (207) 5043626
www.modcon-systems.com

Azerbaijan
Heydar Aliyev avenue 74/17 Baku AZ 1033
Tel: +994-12-4189859
Fax: +994-12-4929859

Israel
Bornshtein St. South Akko Ind. Park, Acre 24222
Tel: +972-4-9553955
Fax: +972-4-9553956

Romania
Aleea Emil Botta, Nr. 4, BL. M104
Sc. 2, Et. 4, Ap. 56 Sector 3, Bucharest RO-031074
Tel: +40-21-3260533
Fax: +40-21-3260552

Russia
Perovskaya str. 61/2, build. 1, Moscow 111394
Tel: +7 (495) 9891840
Fax:+7 (495) 9891840

UK
Suite 1674, Lower Ground Floor
145-157 St John Street, EC1V 4PW
Tel: +44-207-5043626
Fax: +44-207-5043626

USA
2000 Broadway Street
Suite #1203 San Francisco, CA 94115
Tel: +1-917-5916880
Fax: +1-360-2375906