SYNENERGY

Unifying hydrocarbon management in a single system

- Oil & Gas flow metering and calibration supervisory
- Analyser management
- Pipeline Leak Detection and Localisation
SynEnergy
Hydrocarbon Management

SynEnergy consists of a Suite of software modules, tailored to Hydrocarbon Management. These applications range from Analyser Management, Metering Supervisory, and Pipeline Monitoring. By integrating these modules to one Hydrocarbon Management system, functionality is created that has not been available before.

Scalability
By providing a unified web-enabled operator interface, integration into the plant environment has become easy.

Systems can be created which run on a laptop; for instance to do a local manual validation of an analyser. Or a pipeline-wide network of metering stations can be combined with fully automatic calibration, hosted on a central server, and simultaneously running a pipeline leak detection system.

SynEnergy improves the quality of the hydrocarbon accounting. Furthermore, the Operational Expenditure (OPEX) can significantly be decreased by ensuring

- the highest accuracy,
- the least losses,
- the lowest maintenance and hence
- minimal downtime
Basic software modules

KROHNE Oil & Gas has combined its excellent measurement equipment for oil and gas with in-depth knowledge of analyser equipment and calibration. This is dramatically enhanced with the following basic software:

CalSys

CalSys is well known as the standard for validation and calibration of metering systems, analysers and instrumentation.

CalSys offers fully automatic mode, semi-automatic mode or manual mode. In all cases it optimizes the validation process by minimizing errors in operation, calculations and registration using a well-structured and proven software architecture.

(Virtual) Flow Computing

KROHNE Oil & Gas has been creating flow metering systems since 1983. The culmination of all this flow computing knowledge is integrated into extremely versatile flow computing software.

This software consists of NMI-approved software modules, which can be drag-and-dropped and combined on the screen like building blocks to construct the complete metering functionality. The backend of the system automatically generates the proper software documentation.

This software is generally loaded onto the Summit 8800 flow computer. However, unique for the software is that it can run unaltered in a PC as a “virtual” flow computer. Virtual flow computing is ideal when large number of streams must be catered for.
Metering and calibration supervisory

KROHNE Oil & Gas is a key player in metering and calibration. KROHNE has almost 90 years of application experience in flow and level measurement, both in the oil and the gas market. KROHNE Oil & Gas also owns and builds complete calibration laboratories. Over the years we have built up unrivalled knowledge of high accuracy primary and secondary calibration.

We provide complete software solutions for both sectors: measurement and calibration.

Custody Transfer Computing

KROHNE Oil & Gas can build upon 25 years of experience in oil and gas metering.

We can create systems ranging from those based on standard components to purpose-built. We also offer including virtual flow computing systems, the most advanced complete redundant systems with an availability of 99.99%.

Our metering software is designed with connectivity in mind. Web-based interfacing is available. Interfaces are available to DCS (such as OPC), to Hydrocarbon Accounting and SAP for maintenance or accounting.
Performance Monitoring

Today, meters and analysers are becoming intelligent. This has made on-line performance monitoring possible. Ultrasonic meters, for instance, can be verified against analysers using the velocity of sound.

With this, long-term calibration of the metering system can be guaranteed. Current Metering can also be combined with current Proving, Validation & Calibration using CalSys.

By combining the above with Statistical Process Control, events can be predicted and maintenance scheduled, thereby minimizing expensive ad-hoc maintenance.

Alarm Management/ Expert System

Our standard systems include intelligent alarming capabilities to ensure that only true alarms will be generated.

Add to this an Expert System and you can now even augment such alarms with expert advice on how to react in a given situation. The system architecture is open to permit users to add new strategies to continuously improve the system. Operators can also add their own experience to help and support their colleagues.
Analyser Quality Management System. Reduce costs .. .and improve profits.

KROHNE Oil & Gas’s experience in system integration goes back to 1983. From the very beginning, the goal has been to achieve the highest accuracy - amongst others, by concentrating on validation and calibration. KROHNE consequently created a complete analyser management system that ensures the highest performance.

KROHNE’s Analyser Management Systems are used in refineries to ensure the maximum performance of all analytical equipment in the plant.

SynEnergy Analyser Quality Management covers the 3 key aspects:

1. Analytical Performance
Analytical performance ensures the Accuracy and Precision of the analysers and transmitters by orchestrating the validation and calibration process.

The first tool is the significance testing of the validation and calibration results. Statistical Process Control (SPC), the most important tool, is used to check whether a validation should result in a calibration. This accounts for outliers, trends, non-randomness, reproducibility rate and systematic errors. Significance Testing verifies the results of the validation and calibration

Performance reports can be generated per plant, area and analyser.

2. Availability
Availability monitors the operational state of the analysers, creates Time rated performance indicators and generates availability reports..

3. Maintainability
Maintainability uses the QMI information to schedule maintenance activities, ideally preventive maintenance. Communication with SAP permits automatic generation of work orders.
No false alarms –
Pipeline Leak Detection and Localization

**Pipeline Management**
KROHNE Oil & Gas has delivered complete management systems for liquids and gas. These systems are found in process plants, metering sites and block valve stations.

The proven leak detection system continuously monitors the pipeline and warns when and where a leak occurs.

**Pipeline Monitoring System**
This system monitors the pipeline pressures, temperatures and volume/mass allowing the operator to control valves and take any corrective action necessary.

**Leak Detection and localisation**
In many countries leak detection has become mandatory and must comply with official regulations. Leak detection has traditionally suffered from an unacceptable level of false alarms due to limitations of the underlying software. There has always been a compromise between the time to detect a leak and the possibility of false alarms.

KROHNE Oil & Gas has overcome this compromise by developing the Extended-Real Time Transient Model (E-RTTM). This model combines the highest sensitivity even under transient conditions with zero false alarms through a process of Leak Pattern Recognition.

This gives reliable results for stationary and transient flow conditions, even during start-up and stand-still. The model is successfully being used for liquids, gases, and LPG.
From the well head, through massive pipelines, onto tankers and into the terminals and refineries; the flow of oil and gas products needs to be measured accurately and reliably.

That is the world of KROHNE Oil & Gas.

The scope of KROHNE Oil and Gas starts with custody transfer flow metering for oil, gas and liquefied gas and continues through tank management, loading and offloading and leak detection and localisation systems. KROHNE Oil & Gas is one of the most important Companies in the KROHNE Group. The company’s Headquarters are located in Breda, the Netherlands, close to Europe’s major Oil and Gas centres.

We have grown dynamically and now have over 120 persons solely dedicated to the oil and gas industry. KROHNE Oil & Gas now has 6 manufacturing facilities in the Netherlands, UK, Malaysia, USA, Brazil, Colombia, middle East. The headquarters in Breda services the world’s oil industry through its own offices and through the KROHNE group, in more than 60 countries worldwide.

The parent company, KROHNE, has 42 owned subsidiaries and more than 45 representatives throughout the world. We make use of this network to maintain a high level of service for our customers.

KROHNE Oil & Customer enjoy specialised knowledge first-hand with the backing of the world’s most knowledgeable concern in the field of flow measurement technology.

KROHNE Oil & Gas Overview

**Systems**
- Flow Meters for Custody Transfer
- Liquid Flow Metering systems
- Gas Flow Metering systems
- Wet Gas Metering Systems
- Provers & Master Meters
- Flow Computing, Supervisory Software & Analyser Management
- Calibration Systems
- Tank Inventory & Management Systems
- Analyser Houses and Shelters
- Loading & Offloading systems
- Leak Detection and Localisation Systems
- Revamps & Upgrades
- Training, Installation, Commissioning, Service

**Products**
- Electromagnetic flowmeters
- Level measuring instruments
- Variable area flowmeters
- Temperature measuring instruments
- Mass flowmeters
- Pressure measuring instruments
- Ultrasonic flowmeters
- Analysis
- Vortex flowmeters
- Flow controllers