Oil, Gas and Petrochemical

Remote automation solutions for oil and gas applications

Power and productivity
for a better world™

Remote solutions, customized for your requirements

ABB is a worldwide market leader for automation systems and control technologies, supplying solutions and products at all levels of process control and for all types of industries.

Our cost effective, compact products are perfectly designed for remote automation solutions in well head and pipeline applications. We offer redundancy, integrated HMI, flow calculation and programmable logic controllers (PLC) functions to create custom solutions that cover the full range of oil and gas functionality.
Gathering and transport pipelines are the main recourses in the oil & gas midstream process. Typically, these sites are fully automated. To optimize operations, remote terminal units (RTU) or PLC are used for monitoring and control from a centralized SCADA or DCS.
Remote automation devices support a range of functions, from monitoring, remote control and automation, flow calculation to custody transfer support, communication gateway and local data storage.

Pipeline Automation

Block valve stations are sectioning points of transport pipelines at remote sites. During normal operation, mode valves are in the “open” position. When a block valve needs to be closed, pipeline operation must be stopped. Valve line closures are required to perform a pressure test of the pipeline to find small leaks, to isolate a leakage between two block line valves and for safety reasons during routine pipeline maintenance.
Leak detection is now a standard function of pipeline monitoring systems (PMS) in control centers. Basic requirements of PMS are values in real time from the process, especially accurate pipeline pressure values with time stamps during readings. An accurate real-time clock synchronization of all sites is also required for accurate leak detection and leak location calculation by PMS application.
These functions can be realized by either RTUs or PLCs. Aside from their data acquisition function, RTUs communicate data to a control center application with a PMS application. In the event of an abnormal pipeline operation, the operator can close the block line valves via command from the control center.
New installations typically use fiber optic transmission systems with backup routes, while existing pipelines use lower-speed communications systems such as telephone lines. Communication should be robust and data should be stored locally, especially during power outages and redundancy switchovers.
From project to project, many parameters are evaluated before a decision is made to select an RTU or PLC as a solution.

Outdoor RTU cabinet for block valve station in the desert

RTU in a natural gas multi-well PAD application

Integrated automation solutions that deliver added value

Gathering Automation

As technology has evolved and well drilling practices have changed to meet production, economic and environmental requirements, so have the implementation and application of RTUs and electronic flow computers.
The newest generation of powerful, fully expandable measurement and control platforms with 32-bit processor technology allows RTUs to perform a large number of applications, all in a “single box” solution.
The trend among operators is toward multiple well measurement, liquid separation and liquid storage in a greatly reduced physical “footprint.” This small footprint, or pad, may be utilized for a number of reasons. For example, directional drilling has allowed multiple wellheads to be located very close to one another.
Environmental concerns and aesthetics for an increasing population are also addressed by reducing the number of physical locations and concentrating processing equipment for multiple wells into a single pad design.
In single-box solution, an RTU calculates gas volumes and measures liquids from all wells, monitors levels in all storage tanks, monitors all pressures and temperatures, performs all control functions, and may even monitor and control multiple plunger lifts or downhole pumps.
Communication to the control room is accomplished via radio with low polling frequency.

MAC / MEC approach

ABB minimizes customer risk by providing integrated products and solutions as the main automation contractor (MAC) and the main electrical contractor (MEC). Solutions for midstream automation include a full range of instruments and field devices, combined with applications such as compressor/ pumping station automation, leak detection system (LDS), management information system (MIS), pipeline efficiency monitoring, valve station automation and communication system.

Benefits from ABB’s integrated automation offering:

- Lower costs: 20% project cost saving potentials due to reduced spending on engineering, start-up and maintenance
- Lower project risk due to a single integrated team with global reach and resources
- Reduced expediting and inspection due to a single-source supplier
- Faster processes: engineering, commissioning and start-up time reduced
- Best use of technology: truly integrated solutions for long-term benefits

ABB has worked for 30 years with continued success in the area of remote control applications for the oil and gas industry, and has demonstrated extensive expertise in numerous installations and projects worldwide.

Overview of solutions for different applications

Application	Pipeline Automation		Gathering Automation
Customer Process	Gas & Condensate Network	Gas Transport Pipeline	Gas Gathering
Used Automation Product	RTU560	AC800M	Totalflow XSeries
Used SCADA Product	SCADAVantage	800xA	SCADAVantage
Automation functions	Yes	Yes	Yes
Remote control	Yes	Yes	No
Time stamped data to support leak detection	Yes	Yes	No
Process data storage	Week (real-time and archive)	No	Month (archive)
Extended temperature range	Yes	No	Yes
Flow calculation	No	No	AGA-3, API 21.1
HMI	Inbuilt WEB server for maintenance and HMI	No	LCD display
High availability using redundancy in communication, CPU	Yes	Yes	No
Communication needs/ Used protocol	Low bandwidth IEC 61870	Medium bandwidth OPC	Very low bandwidth MODBUS
Power requirements	Low	Low	Very low (battery/solar operation)
Benefits	Increase save pipeline operation Maximize pipeline throughput		Custody transfer measurement Reduce production downtime

Contact us

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RTU - Remote automation solutions for oil and gas applications
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