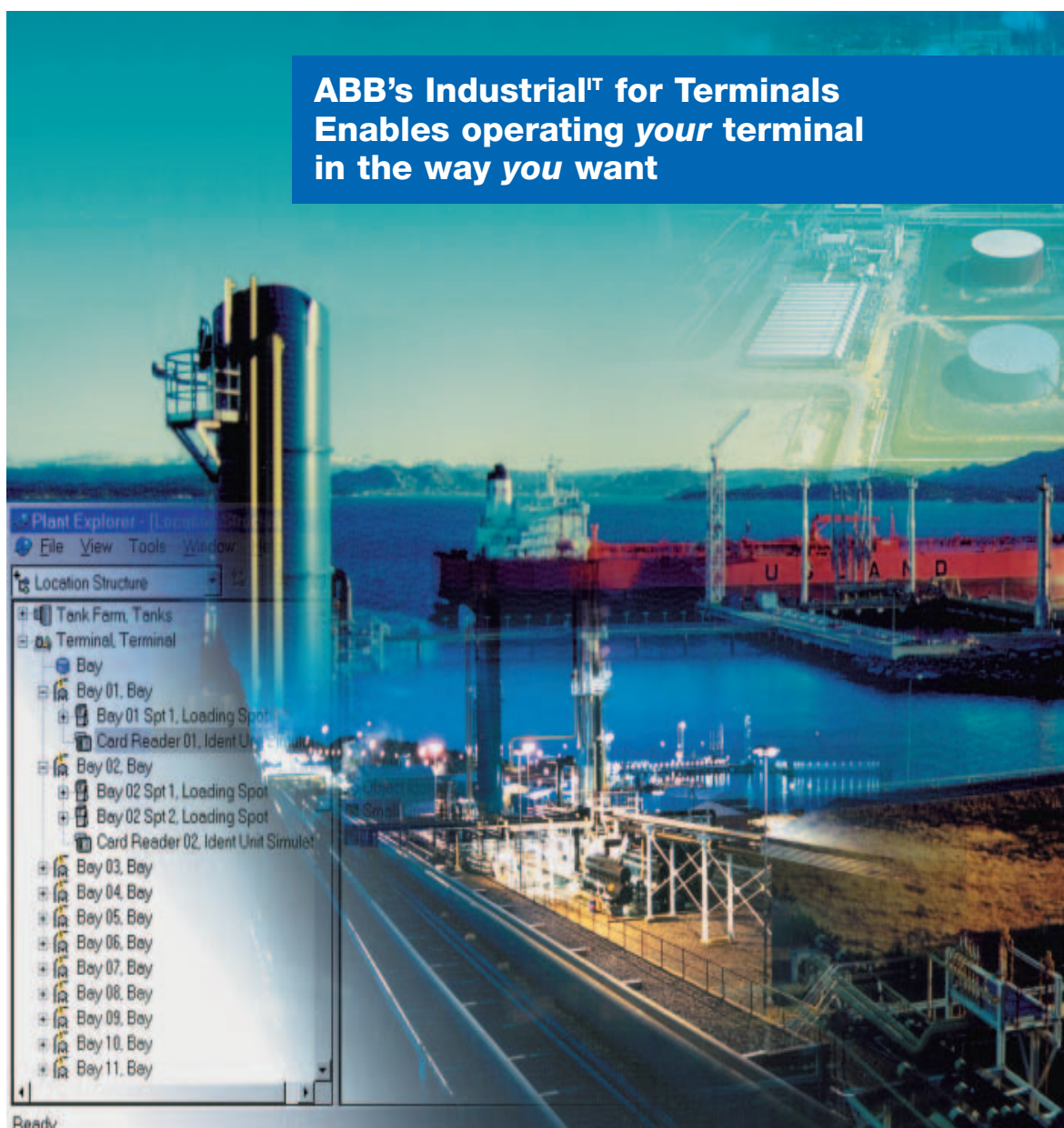


Industrial^{IT} Solutions for Enhanced Terminal Operations

Creating value through integrated solutions

ABB's Industrial^{IT} for Terminals
Enables operating *your* terminal
in the way *you* want





ABB's Industrial^{IT} for Terminals is more valuable than the sum of our Products

As the world's leading supplier to the oil and gas transportation and distribution industries, ABB has provided you with equipment, automation systems, software and services to run your operation productively and profitably. You've thought of us as a measurement company, a controls company and an automation company. We're all of those things. And all of those things combined are Information Technology, or IT. We focus IT on the core processes in your industry, blending the needs of the IT world with the needs of Industrial Automation. That's ABB's Industrial^{IT}. ABB's philosophy is to ensure we add value from the ground up. Individual products should provide inherent value. The synergy of those products when applied in a total system environment should ensure "Absolute Value", emphasizing "Lowest Installed Cost" and/or "Lowest Cost of Ownership". In reality absolute value comes in two ways, the customer must realize lower "Operating" costs, and/or, "Increased Revenues". This is our goal.



ABB custom-builds complete Industrial^{IT} solutions for the distribution terminal industry to maximize your profitability and minimize your costs

ABB offers total solutions for transportation and distribution to manage the movement of petroleum and chemical products through pipelines, tankers and terminals; eliminate losses; and meet strict government regulations. From the blending unit in the field and on to the boardroom, ABB's Industrial^{IT} for Terminals gives your distribution terminal business a new competitive edge, with unsurpassed enterprise connectivity and information access.



Aspects and Objects

A key feature of this next generation technology is ABB Aspects Objects™, which integrates information from a variety of applications and makes it available in real-time to any authorized users regardless of their location. Terminal data and terminal components are presented as configurable software objects. Each object carries a range of related information (for example, electrical specifications, intellectual properties and identity information) that makes the object instantly recognizable to enterprise-wide information networks. With Aspects Objects, terminal related information is deployed rapidly and uniformly, so that personnel throughout your enterprise view your business through the same real-time "window". Better information means faster and better decision-making and more control over assets.

Industrial^{IT}
enabled



Services

ABB's professional services range from providing electrical equipment or instrumentation to delivering the most sophisticated terminal management system. A typical scope of services for the terminal industry includes:

- Project management
- Site survey and analysis of existing facilities
- Basic and detailed design and prototyping
- Hardware and software engineering
- Installation and commissioning
- Startup assistance and training (including computer-based training)
- Service and maintenance during the whole lifecycle

ABB can help by providing services, consultation and training as an integral part of the project throughout its life-cycle, including planning, design, production and startup. ABB's support doesn't end with commissioning: online and onsite support is an important part of our program for both manned and unmanned terminals.

Terminal Management and Control Solutions

Terminal Management

The prime responsibility of a terminal management system is to ensure that a terminal or storage facility operates in a secure, safe and well-documented manner. Efficient management of terminals and improved usage of storage facilities are essential to move product throughout the enterprise.

ABB empowers you to access real-time information about your products and facilities on a unified enterprise model so you can make faster, better-informed decisions and successfully implement them for profitable growth. As knowledge is the most precious commodity in business today, the biggest challenge facing terminal managers is to deliver relevant information at the right time, in the right form, to the right people. ABB's Industrial^{IT} dramatically improves enterprise connectivity and the quality of information acquired.

Modular Approach

ABB has long recognized that the automation needs of our customers differ greatly, depending upon their business and operational requirements and the layout of their facilities. Therefore, ABB terminal management solutions are flexible. You can even automate part or all of your terminal or storage facility yourself. ABB's approach is built upon the following three modular subsystems:

- Product receipt
- Product storage
- Product dispatch



Our terminal management system integrates and controls loading racks and associated equipment, pumps, valves, motors, weigh scales, meters, card readers, data entry terminals, remote connections, smart additive equipment and utilities, vapor recovery units and safety and shutdown systems. In addition to the core functionality, the system also provides features designed to automate truck, railcar, ship, barge and pipeline receipt and shipment.

Features:

- Terminal object library for control, monitoring, logistic transactional handling and terminal modeling
- Open system design
- Fully configurable, supporting almost any combination of products, recipes, plant equipment, etc.
- Multiple language support
- Remote access, if needed through the web
- Network connectivity
- Security and access control
- Event and alarm logging
- Audit trail
- Intuitive configuration tools, available across system and application boundaries

Modular Approach

Functions:

- **Product Receipt:**
 - Batch scheduling
 - Valve manifold control and sequencing
 - Tank receiving operations
 - Inventory reconciliation
 - Metering and meter proving
 - Pump control and sequencing
- **Product Storage:**
 - ESD, F&G and safety systems
 - Interface with field devices
 - Automatic tank gauging
- **Product Dispatch:**
 - Terminal entry and exit validations
 - Driver entry and exit validations
 - Vehicle entry and exit validations
 - Order processing and management
 - Blending and additives solutions
 - Reporting and documentation tools
 - End-of-day (EOD) and end-of-month (EOM) procedures
 - Automated staging and bay queuing
 - Bill of lading (BOL), filling advice notice (FAN)
 - Product reconciliation
 - Allocations/quota management
 - Interface with host systems

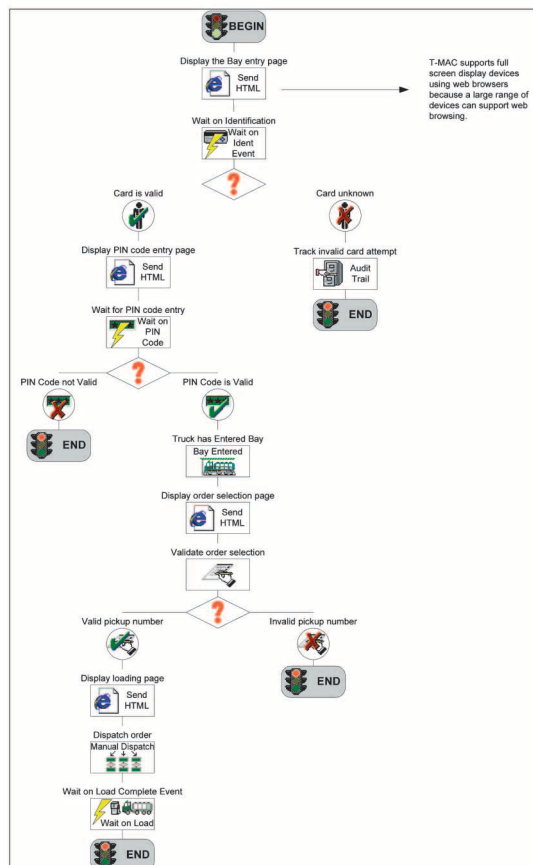
Terminal configuration

Graphically configured components are used throughout to deliver a flexible solution that exactly matches a terminal's requirements. Thoroughly tested and standardized components are used to build the system, from external system integration, all the way through security procedures, loading control, product receipt, inventory management, display and control.

Zero Tolerance for Error

Efficient terminal management requires perfect reliability and performance and zero tolerance for errors and delays. That's not a difficult statement to justify when you consider the cost of the products being dispensed, and the wafer thin margins in the industry. So ABB designed its terminal management solutions with an enterprise-level software framework that integrates physical device level control, business procedures, human/machine interfaces for drivers, operators, engineers and management and information storage and retrieval into a unified architecture.

- **Scalability** – A components-based architecture permits both functional and geographical distribution. Most small to medium terminals can be run from a single server, while large terminals can be hosted by two or more computers.
- **Reliability** – ABB automates terminals using a standardized set of software components that have been extensively stress-tested in the field. The unique requirements for each terminal are realized by configuring these components graphically rather than making internal code changes that would result in unsafe and untested systems.
- **Availability** – We have fault tolerant solutions to match the availability requirements and budget of every terminal. Options range from complete dual and triple redundant solutions with automatic failovers through simpler manually switched cold-standby units.
- **Security** – Our highly configurable authority system prevents unauthorized persons from gaining access and activating commands. ABB's solution is based on Microsoft Windows security features.
- **Openness** – Open communication with system components is established through standards such as ODBC, COM, XML, SOAP, OPC and OLE. These state-of-the-art features are offered along with sophisticated front-end communications with redundant configurations and automatic switch-over in case of lost communications with remote devices.



ABB's Industrial^{IT} for Terminals Enables operating *your* terminal in the way you want

Flexible Field Device Connectivity

The field devices in today's terminals are supplied by many different vendors. These devices are controlled through different proprietary communication protocols and procedures. ABB supports these various devices, protocols and procedures by remaining protocol neutral. Our system recognizes virtually any field device protocol in existence, while keeping the core logic completely device independent. With ABB terminal management systems, you're free to select industry leading hardware that meets your terminal's requirements, confident that ABB can support and leverage it.

Technology That Guarantees Data Accuracy

Accurate product tracking is a central part of any terminal management system. The accounting required to track product movements between suppliers and customers is technically not different from the accounting performed by financial institutions when they move money between accounts. Moreover, information corruption or loss can be just as serious for a terminal as for a bank. Thus, we build our terminal management systems on a technology pioneered by financial institutions to ensure consistent information.

Supporting the installed base

We assimilate your current equipment and control devices right into Industrial^{IT}. We incorporate your existing sensors, transmitters and tank level measurement systems as well as your existing intelligent electronic devices and controllers into a single automation solution.

Benefits of Industrial^{IT} for Terminals

- Better insight into ongoing terminal operations and terminal performance, even for several terminals at once
- Improved terminal efficiency (reduced inventory, more flexible operations, improved usage of facilities, improved throughput, minimized downtime)
- Improved terminal safety, for reliable operation in the most hazardous environments
- Reduced system/terminal maintenance
- Simple integration with existing automation solutions
- More cost effective engineering, implementation and testing

ABB's Industrial^{IT} solutions seamlessly link your business and trading systems in real time, creating a single source for operational, engineering and business information in other words, a TOTAL ENTERPRISE SOLUTION. With this approach, you can coordinate and optimize your dispatching operations, and integrate them with the rest of your business, a true competitive advantage.





ABB's portfolio

ABB has made and fulfilled the commitment to offer a whole portfolio of solutions for Enhanced Terminal Operations. These solutions range from instrumentation through power and drives to collaborative commerce solutions, and from standard monitoring and control strategies to dedicated technologies for terminals and terminal-related operations, such as advanced blending and pipeline solutions.

Solutions for Pipelines

ABB's products, devices and technologies for oil and gas pipeline automation encompass block valve stations, pump stations, tank farms in liquid applications and compressing, reducing and metering stations in gas applications. All of the pipeline management Industrial[™] solutions from ABB are well-suited for transportation and distribution of crude, fuel, gas and petrochemical products, including:

- Field products and end devices
- Field interfaces and transmitters
- Remote terminal units (RTU)
- Flow computers
- Field controllers
- Field communications
- Hybrid control systems
- Distributed control systems
- Applications
- Support and maintenance

The pipeline station automation functions include:

- Compressor control
- Pump control
- Valve control
- Set point control
- Pump group control
- Tank measurement
- Flow measurement
- Quality measurement
- Temperature measurement
- Pressure measurement
- Scraper catch and launch automation
- Operation shutdown function
- Leak detection by pressure analysis
- Energy management



Solutions for Blending

The ABB Regulatory Blend Control (RBC) package provides comprehensive base regulatory and sequential control of the blender equipment, flow rates and component ratios. RBC provides the following features:

- Recipe processing and verification
- Blend startup
- Equipment line-up and sequencing based on selected component and product paths
- Calculation of blend master set points
- Blend equipment monitoring
- Total blend and related component/additive data
- Individual flowstation flow and volume temperature compensation
- Error correction and calculations
- An interface to Advanced Blend Control, Analyzer and Tank/Terminal Interface Management systems

Liquid Movement and Storage Expert System Solution

ABB's Liquid Movement and Storage (LM&S) expert system accesses and capitalizes on the profits generated by your bulk liquid terminals and storage facilities. The LM&S applies easily configured rules and topology to optimize material movement and path selection within your terminals. It identifies the best use of equipment and inventories, and presents its results in easy-to-understand graphics.

A single model topology of the facility is presented graphically to the terminal operators and any other user in much the same form as a process flow diagram or facilities plot plan. Optimal material movements and optimal path selection between source and destination rely upon rules that address issues such as product degradation, material compatibility, resident materials flushing, equipment loading, equipment commitment and utilization. The LM&S system considers:

- Circulation
- Inline blending
- Parallel blending
- Serial blending
- Transfer
- Water drainage



A Total Suite of Telecommunication Solutions for Terminals

ABB's solutions are based on the leading industrial telecom technologies and allow for simple, reliable and secure operation throughout your terminal's lifetime. These systems can adapt to your changing needs, protecting your investments. ABB designs each telecom system for integration with other

telecom and automation systems. This enables you to build seamless common control and information infrastructures; not only for one specific terminal, but also for an overall network connecting all terminals from one specific client.

Motors and Drives

As the world's leading supplier of drives and motors, ABB pioneered digital AC and DC motor speed control for the transportation and distribution industries. ABB's dependable single-drive and multi-drive systems provide a simple and clear solution for fluctuating flow rates. The use of variable speed drives helps reduce energy consumption while it enhances system versatility and user-friendliness.

Features

- Flexible pump operation and selection
- Less equipment and fewer moving electrical components
- Efficient energy usage



Power Technology

ABB is also the world's leading supplier of power technology products. ABB delivers solutions, systems and equipment to efficiently transmit, distribute and control electricity. We combine an extensive line

of hardware with expertise in network management, control, protection and monitoring and with consulting and diagnostic capabilities.

Industrial^{IT}

The next Way of Thinking

Industrial^{IT} solutions from ABB blend the industry's broadest portfolio of industry knowledge and products with a proven architecture for *real-time* enterprise automation and information.

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