



Advanced micro-processor control provides major benefits for power utilities in safety, availability and economics.

Panorama Station Automation - harnessing the power of information technology

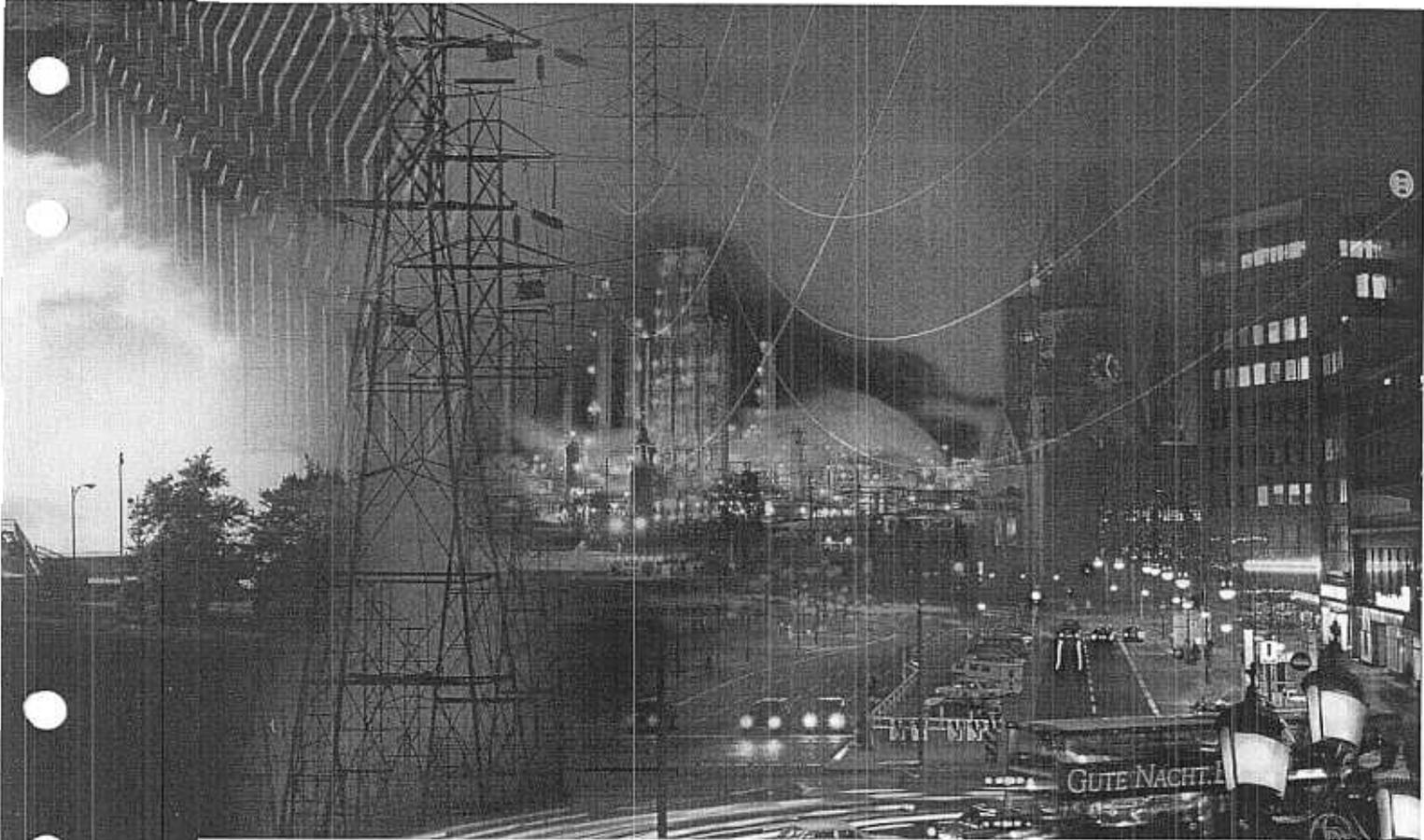
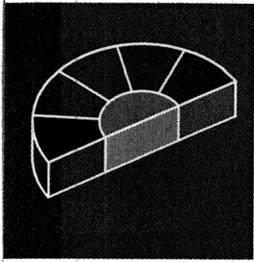


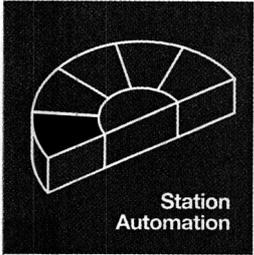
ABB Network Partner

The ABB logo, consisting of the letters "ABB" in a bold, stylized font.



The total proposition

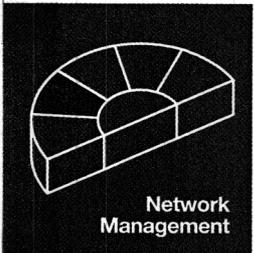
Panorama is the standard for a comprehensive range of integrated solutions for efficient and reliable management of power networks. Using innovative information technology, Panorama delivers total control of the power process, from generation to consumption. The Panorama standard covers six application areas, each offering specific solutions.



Station
Automation

Station Automation

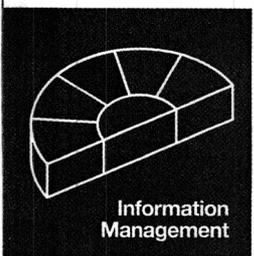
Station Automation includes control, monitoring, and protection for power plant, transmission, distribution, and industry applications. Solutions range from single function units to fully integrated, comprehensive, high-performance substation automation systems.



Network
Management

Network Management

Network Management enhances operation of interconnected power networks. It provides integrated solutions that optimize energy supply while maximizing reliability on both transmission and distribution networks.



Information
Management

Information Management

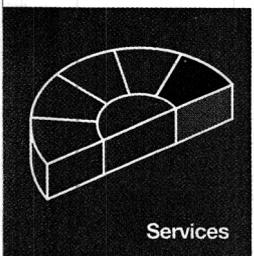
Information Management offers full-control solutions for power utility business processes. Power utility data management is supported by a full line of solutions including asset management, integrated customer databases, energy trading, and accounting.



Meter & Load
Management

Meter & Load Management

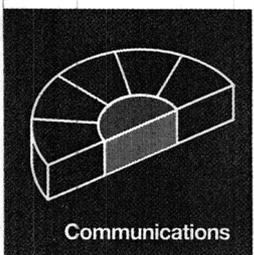
Meter and Load Management comprises products and integrated systems for automatic meter reading, home automation, direct load control, and demand-side management.



Services

Services

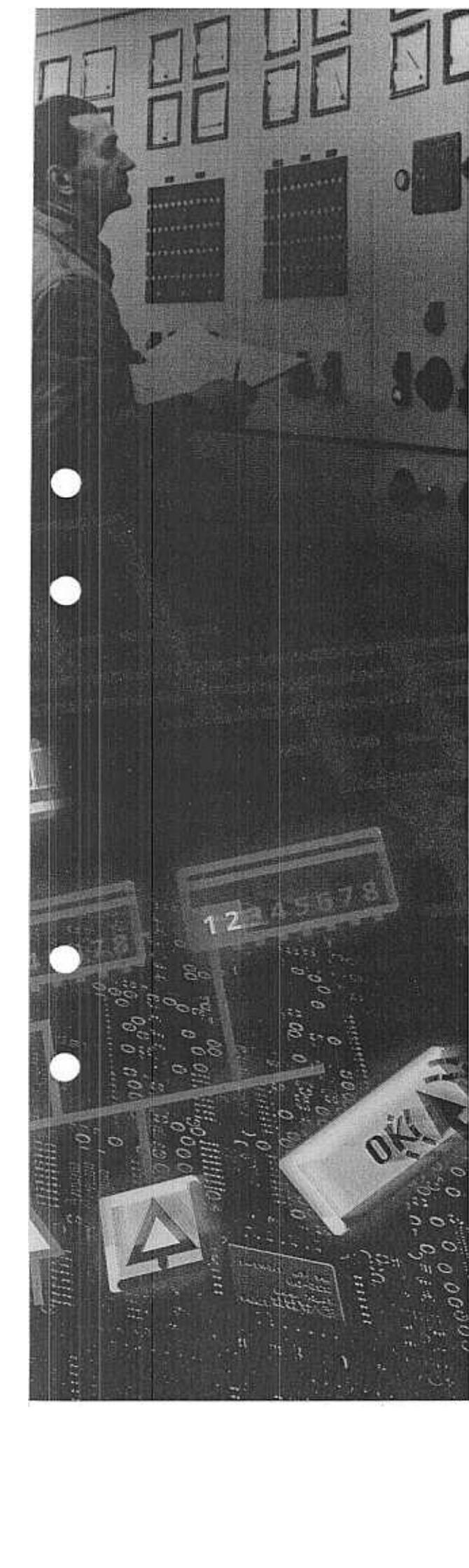
The range of comprehensive services includes pre-studies, project management, engineering, system configuration, documentation, installation, commissioning, training, upgrading, and maintenance.



Communications

Communications

Communications offers solutions for all communications requirements in the transmission and distribution networks of power utilities and industries.



Panorama Station Automation – Information means power.

All along the line - from generation to consumption - ABB Network Partner AB offers today's rapidly evolving power industry solutions that match the speed of change. Built upon decades of commitment to the power industry, ABB Network Partner AB information technology, system integration, products, services and training are key elements for maximising your power network utilisation. This means increased profitability and greatly enhanced competitive position for our customers and partners, through better and more economical use of generation, transmission and distribution infrastructures.

In the power industry reliability and cost-driven pricing have been a way of life for the last hundred years. Changes present many uncertainties. Re-engineering, more complex regulatory and environmental constraints, increased competition from non-utilities. Having ABB Network Partner AB as your partner can turn the uncertainties into opportunities.

We are continuously developing the Panorama Station Automation concept which provides the management information required to support safe operations, and to make those operations more effective and more efficient. Safety and security are essential features in any transmission and distribution network. By adding intelligence to the nodes in the network you can acquire the knowledge you need to better control them. Reducing costs, improving reliability and boosting your profits.

Panorama Station Automation provides the key to greater information and better control for improved effectiveness and efficiency in power delivery.

Panorama Station Automation means better overall economy.

Panorama provides the key for better network economy. Fully integrated into large networks or installed as self-contained subsystems, intelligent station management systems can make massive contributions to cost effectiveness and network performance. An investment in intelligent secondary systems shows a major return on investment in surprisingly short time.

With an integrated system end to end you gain economy in training, operation and maintenance

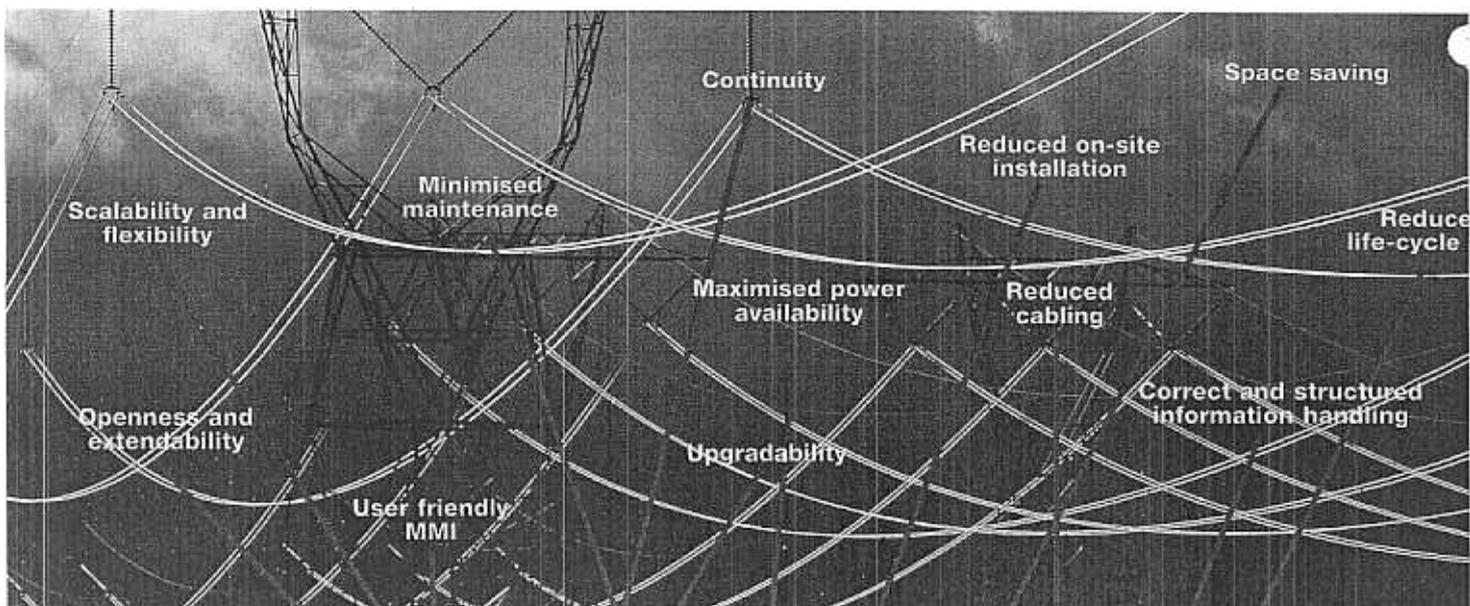
The investment in equipment has to be matched by training and manning. With Panorama Station Automation a great deal of thought has been paid to how to make the system user friendly, to cut down training time, to rationalise procedures and to reduce the possibility of misunderstanding and there-

by remove the opportunity for human error. In addition high operational reliability, automatic self testing and supervision mean that maintenance is considerably simplified.

Precisely tailored for today, flexible to meet tomorrow

Panorama Station Automation is designed around a modular approach so that meeting your precise needs is rapidly and easily done. The system is designed for long-term maintainability, extendability and compatibility so that your investment is safeguarded all along the line. In addition the expandability and openness of system architecture mean that interfacing with future equipment, additional functionality and changes in technology can rapidly and easily be accommodated.

Panorama Station Automation offers a wide range of features which deliver cost and efficiency benefits for all areas of transmission and distribution.



Cutting down the space, reducing the costs

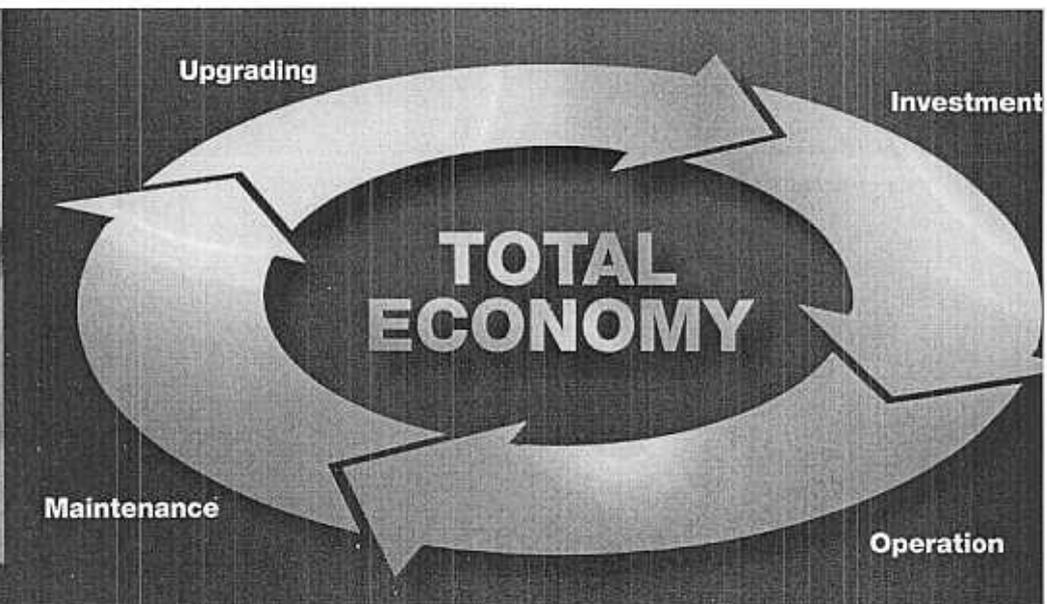
Panorama Station Automation is designed to take up as little space as possible, reducing the amount of cabling to the minimum, using thin fibre optic cables for maximum data transfer rates and placing all control interfaces within reach of the operator. This removes the need for physical control panels, reducing the amount of space needed in the control room and consequently the size of the building needed to house it. Modular construction means that most equipment can be pre-assembled and tested in the factory, cutting down the time and cost of on-site installation and commissioning.

Reducing life cycle costs reduces the cost of energy

The reduced life-cycle costs are brought about by improved reliability of components, reduced stress on the switchgear and transmission equipment. Further more, reduced manning levels for maintenance, less repair visits to remote sites and the future proofing of the systems, mean major savings in the cost of providing network support. This in turn contributes to minimising the cost for the consumer of electrical energy.

Panorama Station Automation integrates information so it is easy to use, reduces training time, reduces the risk of misunderstandings and provides vital information at exactly the right time.

Panorama Station Automation is designed to make a major contribution to the overall economy of your power network performance.



Panorama Station Automation.

The complete concept.

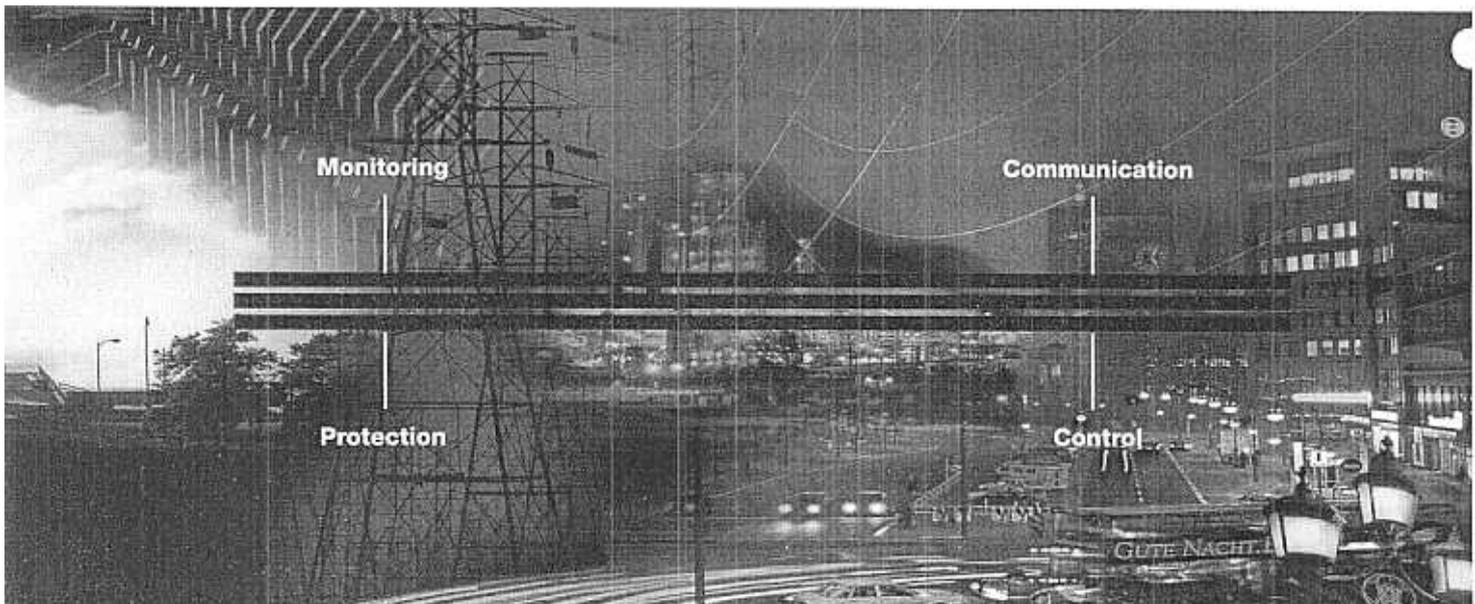
Safety, security and supervision of electricity transmission and distribution systems represent a very small fraction of total cost and yet are absolutely vital in ensuring the dependable, safe and economical supply to the consumer.

Panorama Station Automation combines protection, monitoring, control and communications into one intelligent package. Replacing conventional control panels and sub systems with a computer based data collection and management system custom designed to meet all your operational requirements.

Better data collection, better data management, better system control

The speed and power of modern computer technology and the carrying capacity of fibre optic communications mean that more data can be collected and processed faster than ever before. Our long term partnership with the power supply industry means that not only can our systems collect data. We also know what data to collect and how it should be distributed and stored. Raw data is often not enough, it needs interpretation, distribution and presentation so the right people get the right data at the right time. This way cuts confusion, improves speed of reaction and heightens awareness.

Dependability, security and fault tolerance are just part of the complete control package that Panorama Station Automation offers. It combines protection, monitoring, control and communication into one intelligent package.



Panorama Station Automation is a modern integrated approach to the concept of station automation management. It combines protection, control, monitoring and communication into one versatile system.

Within this concept you can establish precisely the level of functionality and complexity you wish to operate at, to match your operational and budgetary requirements.

When turning to ABB Network Partner AB the selection of control, communication, protection and monitoring modules is made easy. We offer a range of well-proven solutions to match a variety of needs.

Panorama Station Automation Compact configuration

The standard Compact configuration comprising minimum required functions comparable with conventional manual control.

A Panorama Station Automation compact, plus or peak configuration can easily be selected to suit any station automation application requirements.

This includes the operator station and integrated protection/control terminal connected via the station bus.

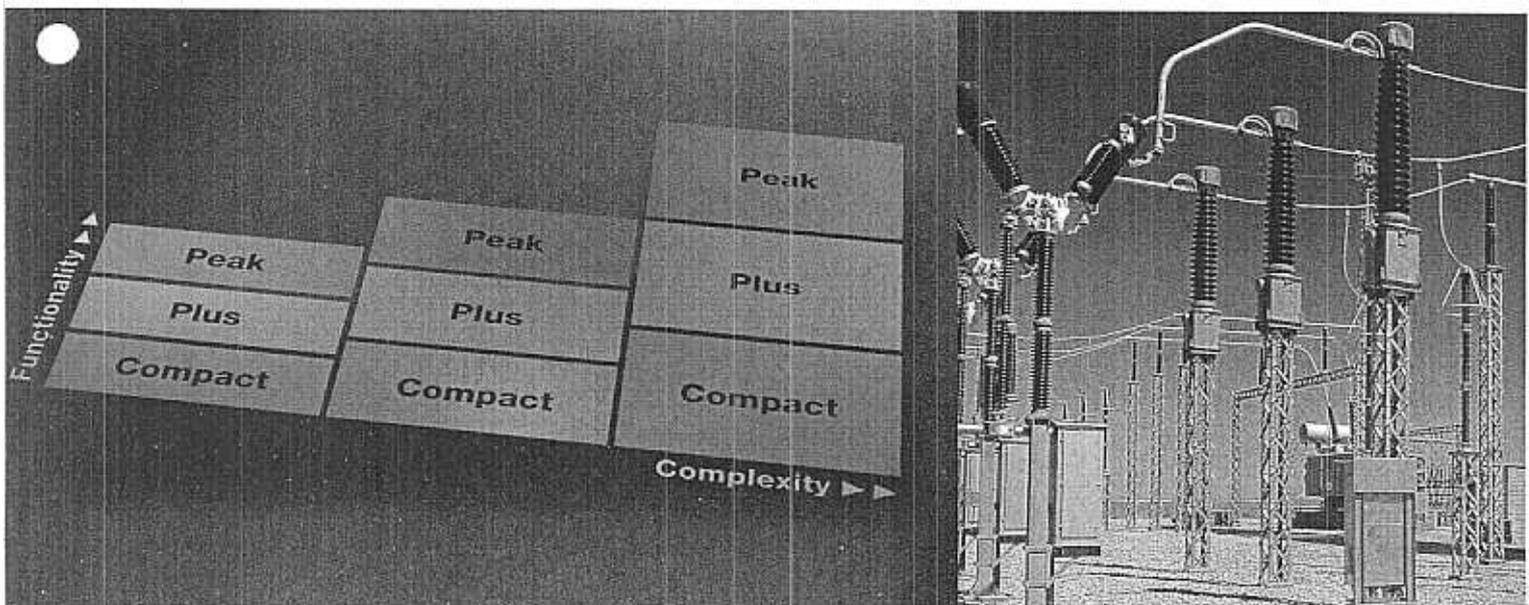
Panorama Station Automation Plus configuration

The Plus configuration is similar to the Compact configuration, but with additional hardware such as separate terminals for protection and control. Additional functions increase availability and independence.

Panorama Station Automation Peak configuration

The Peak configurations provides maximum availability and network security. Design depends on customer configurations but can mean, for example, individual control terminal per bay or breaker, separate communication gateways, extra operator station, communication port redundancy and separate station monitoring functions.

Modularity ensures that Panorama Station Automation can be rapidly and easily expanded and upgraded to meet changes in application requirements.



Panorama Station Automation provides effective Protection and Control.

In substation operations protection and/or control are the main priorities with a high demand for speed, sensitivity, selectivity, security and dependability. Panorama Station Automation provides additional automation, control, monitoring and recording functions using the power of microprocessor based technology.

An integrated platform for complete protection

Microprocessor based techniques make it possible to combine many functions into one physical unit. The traditional relay or protection function is combined with many other functions within a single terminal unit.

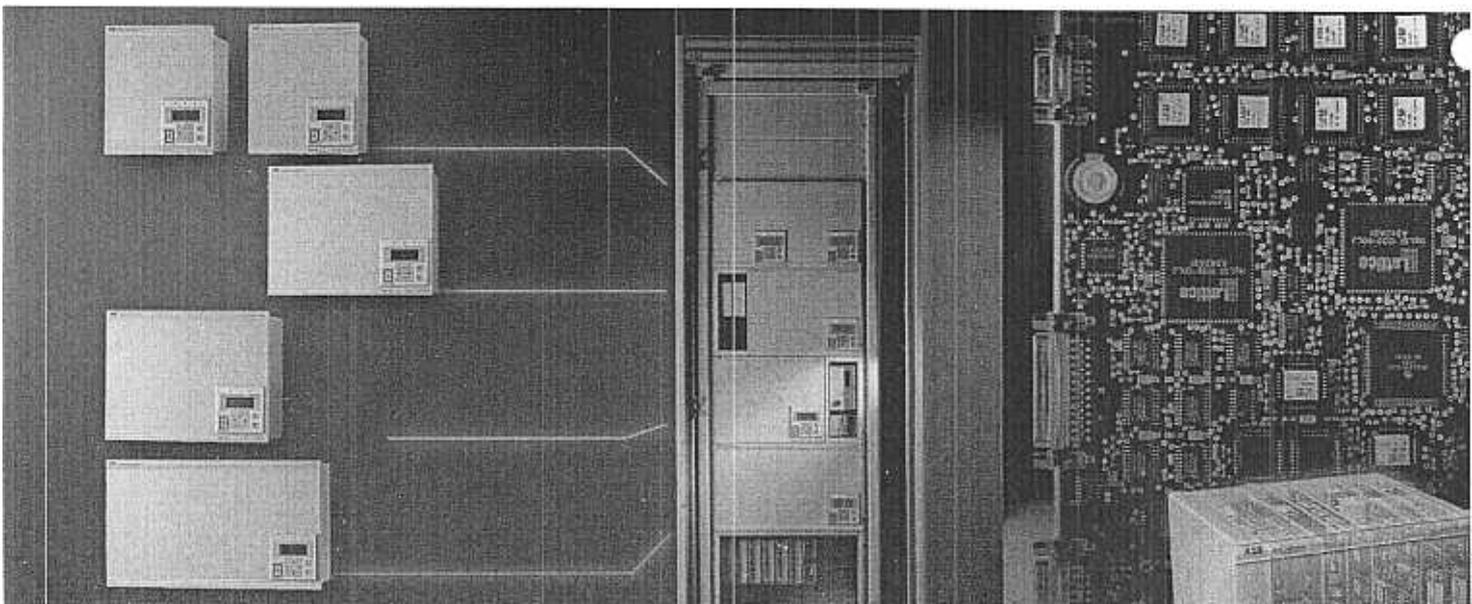
The integration of functions within one multiprocessor environment means that the terminal plays a key role in the Panorama concept.

The system is based on the concept of distributed intelligence, where each terminal handles all information. In addition each terminal is equipped with self supervising functions to monitor conditions and performance.

Consistency and compatibility of data parameters, transmission and collection make for more reliable data and better understanding of the entire process. Multiple processor and multiple communications mean that separate functions need not interfere with each other and improve reliability and back-up capability within the terminal.

ABB Network Partner AB has more than 15 years experience of micro-processor based protection and control with 200,000 units operating in 60 countries.

The 500 Series uses the same hardware and software platform for protection and control applications. The use of this common platform supports easy integration of new products from the same range into the system.



In addition using the same platform for all functions means that new functions and new products from the same range can be installed without extensive retraining of personnel and that switching between functions is done within the same interface.

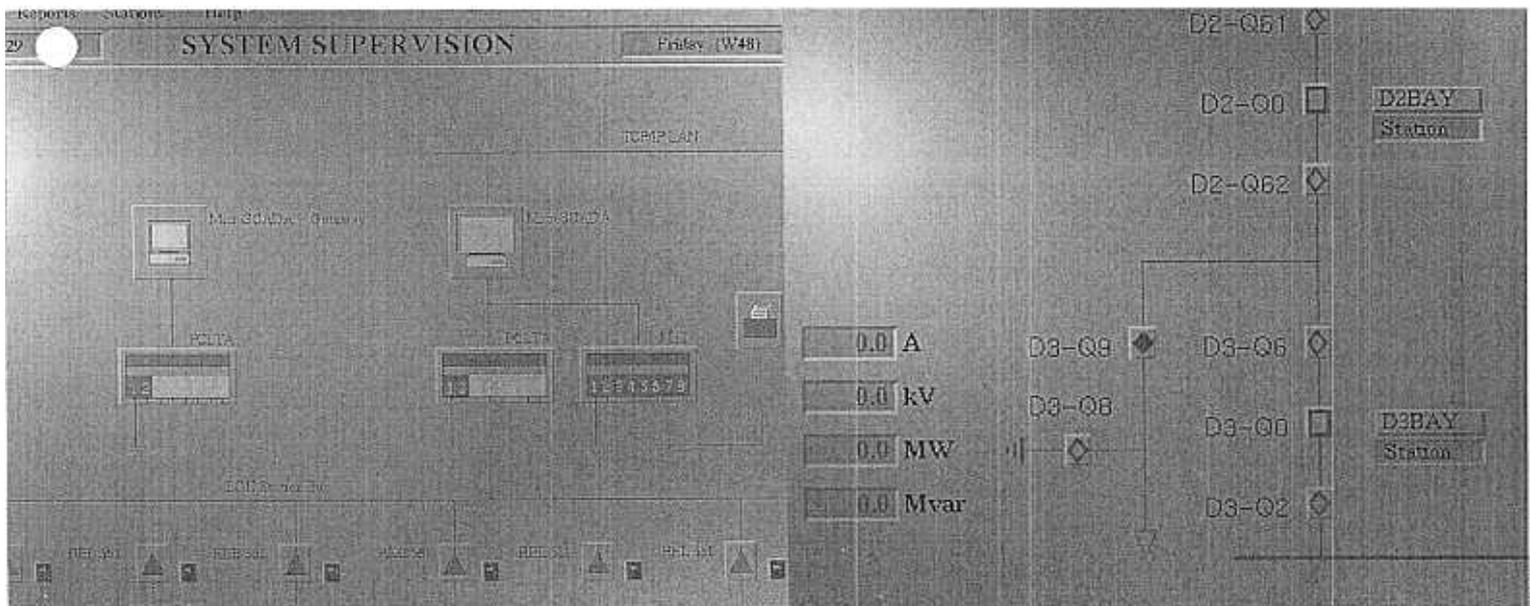
Information for total control

Panorama Station Automation control systems are based on PC compatible workstations locally situated in the substation. The system provides local supervision and reporting on all aspects of the substation operation. Software is developed from the S.P.I.D.E.R. micro SCADA open system platform. Terminal emulation makes it possible for the operator workstation to be used in nearly all remote applications.

The system allows easy transition from simple single workstation environments to fully expanded large multi user systems. Fully expanded systems consist of electricity transmission and distribution applications with fully integrated tools and functions for ABB Network Partner's total range of station automation terminals.

Panorama Station Automation provides reliable presentation of control and supervision for all data. Measurement of voltage, current, frequency etc., time recording, alarm and disturbance handling, storage and development of historical information, are clearly displayed.

The control and supervision displays of Panorama Station Automation provide clear information and rapid access to all functions.



Panorama Station Automation provides comprehensive Monitoring and Communication.

The immense flexibility and functionality of the protection terminals means that Panorama Station Automation offers a wide range of setting and configuration tools for both on-line and off-line use making it possible to prepare settings on workstations not connected to the terminals and rapidly transfer settings one terminal after the other. All the settings can also be stored in a central database for applications throughout the transmission and distribution network.

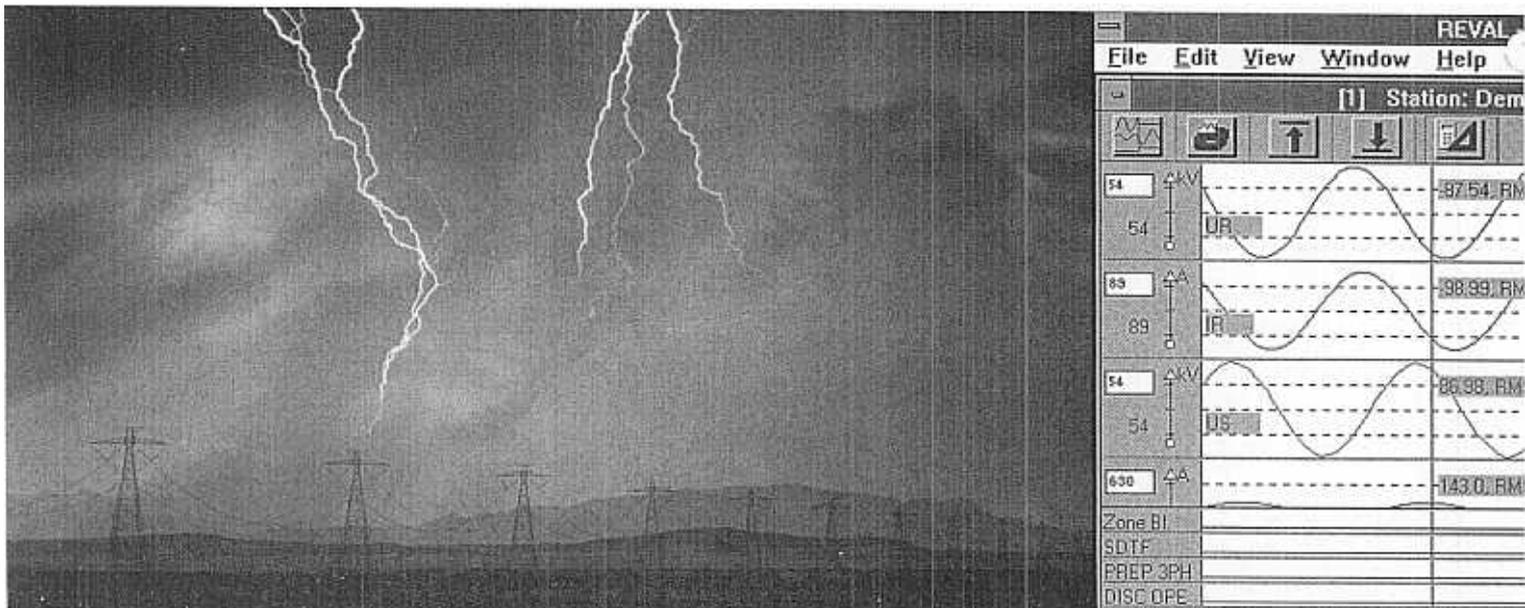
Software tools simplify the calculation of settings for rapid clearing of all types of faults. The analogue and digital values measured by the terminal can be used for supervision of the network by cyclic polling and storing. Extensive self supervision within the terminal provides information to the monitoring function for efficient and optimised maintenance of equipment.

Comprehensive disturbance recording, event reporting and data evaluation

Disturbance recording can be built into the terminals so that the disturbance recording function is distributed throughout the network, with local intelligence and recording functions. Data can be retrieved remotely via modems either upon request or by automatic polling. Evaluation of disturbance data is carried out with powerful evaluation software. Expert system facilities allow automatic evaluation of disturbance files and storage of the information in a standard database for future retrieval and analysis.

Event reporting can be configured for local needs. The most detailed records are stored at the terminals registering all events during a fault. Only user specified events are passed to higher levels to reduce "information pollution". This means that event information can be used for rapid decision making at the time of the fault, especially if presented as an alarm condition, and for detailed analysis at a later stage.

Evaluation of disturbance data and event reporting are handled with powerful Panorama Station Automation software. It supports rapid decision making as well as storage for future analysis.



Open versatile communication for rapid and easy access to information

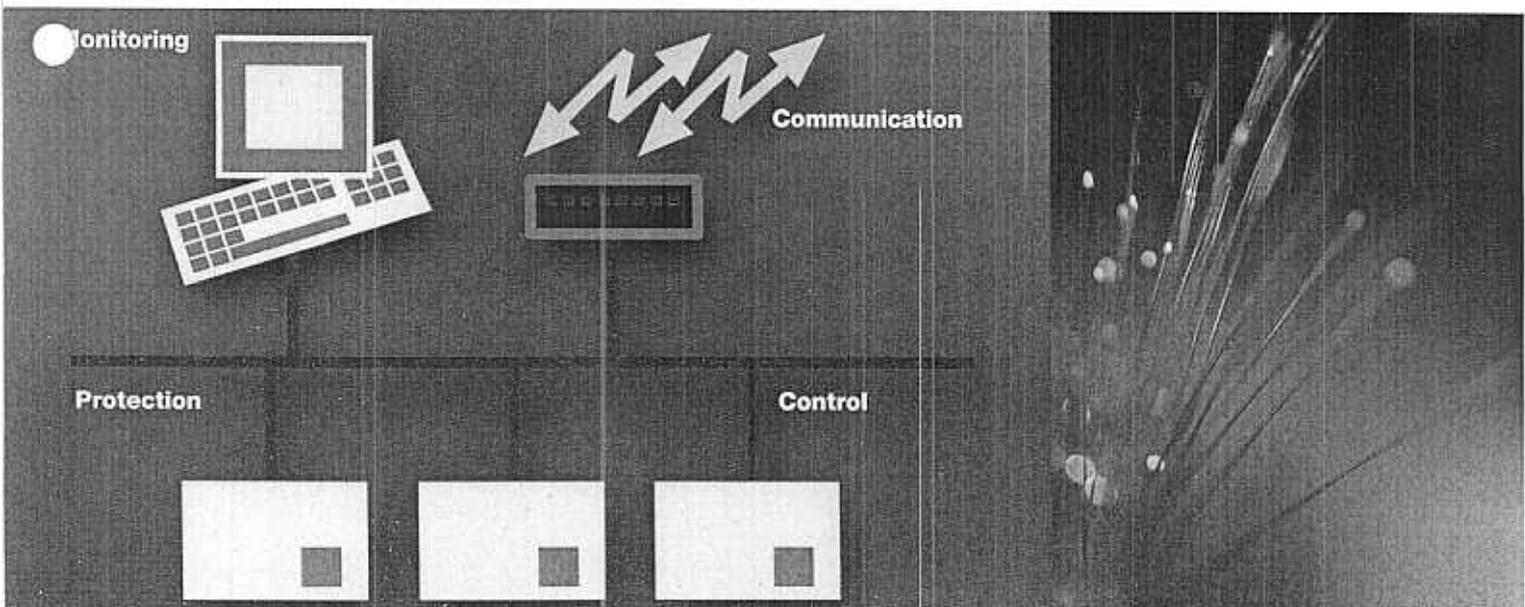
Panorama Station Automation data transmission is organised in a distributed network environment for both local and remote communication. It is based on international and de-facto standards supported by a fast real-time communication.

The use of fibre optic cables eliminates the risk of electromagnetic interference. In remote communications a wide range of vendor specific protocols have been implemented for the highest level of compatibility with all transmission systems.

At a local level interbay and bay to station communication is handled by a fast LON bus and the SPA bus. LON is event driven and comprises master independent spontaneous message handling and bay to bay communication. Substation communication is based on Ethernet and TCP/IP standards. Serial line remote communication include connection to substation monitoring units, remote control workstations and network control centres. Panorama Station Automation is compatible with ABB network control systems and third party systems via gateways.

Communication is vital in all Station Automation systems. Panorama Station Automation is designed for rapid and easy access to information in local as well as in remote communication. It also supports communication with third party systems via gateways.

Extensive use of fibre-optic cabling eliminates the problem of electromagnetic interference.



Panorama Station Automation

The coordinated approach.

From locally provided single console integrated control, to individual function terminals to remote supervision, all can be achieved within Panorama Station Automation.

Remote workstations can be linked to substation operations using the public telephone network. These workstations can be used for redundant network control or as a base terminal for the process operator in charge.

Flexibility for all your needs

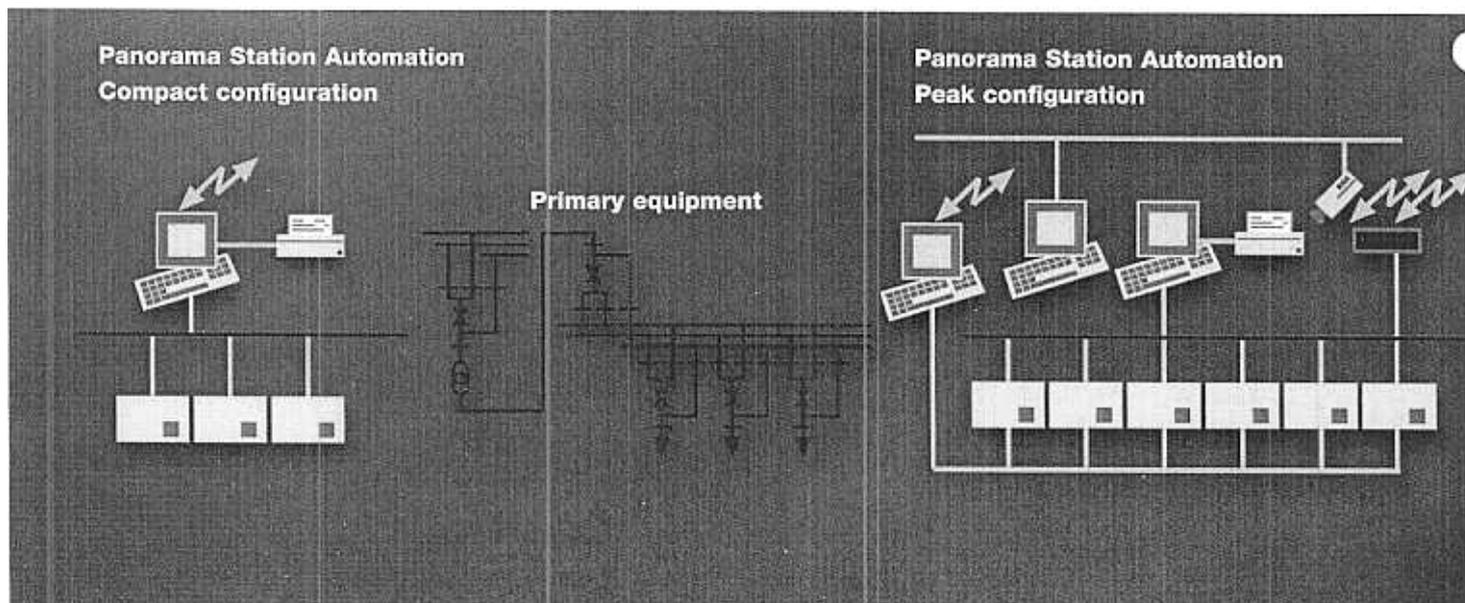
All bay level protection and control terminals have built-in operator panels with access to all relevant data. These allow parameter settings to be changed directly from the terminals. Configuration and parameter setting can also be done by connecting a portable computer with appropriate software directly to a terminal.

Protection and/or control are the main priorities with a high demand for speed, sensitivity, selectivity, security and dependability.

Additional automation, control, monitoring and recording functions can be provided using the advantages of microprocessor based technology.

The scalability designed into Panorama Station Automation guarantees maximum flexibility so that you can decide the level of integration and automation need for your particular power, service and budget levels. This can range from fully bay oriented configurations with separate terminals for protection and control to solutions which offer full integration within one supervisory terminal.

Panorama Station Automation offers Compact, Plus and Peak configurations. All provide sophisticated and coordinated protection, monitoring, control and communication.



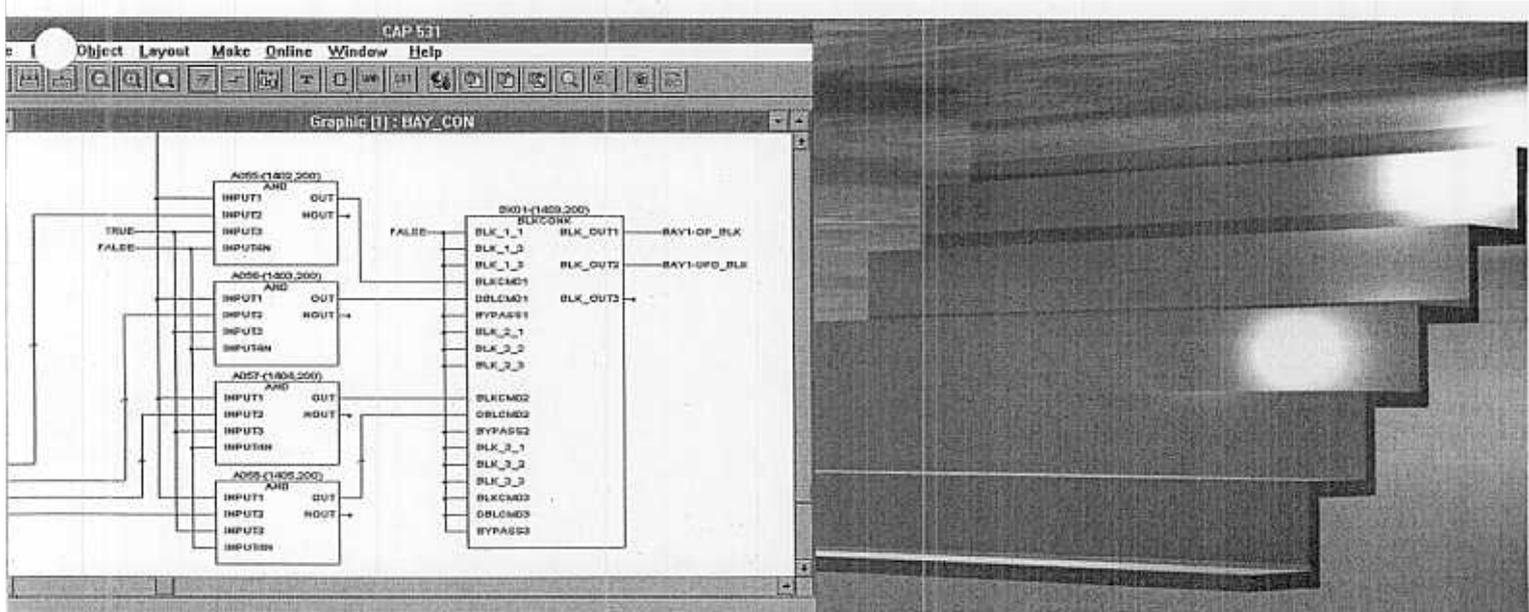
Powerful software tools for data handling and system configuration

Since complete information from both protection and control is available within the system combination of data can provide wide ranging functions: protection based on actual configuration, adaptive load shedding depending on actual load conditions, maintenance on request taking into account the wear on primary switching objects, backup functionality in protection and control bay units.

Configuration and application software tools provide a library of standard functions based on field proven application and system elements. These tools cover such areas as configuration, application engineering, calculation, protection and control unit settings, disturbance evaluation and analysis, measurement evaluation, list handling and application documentation.

Powerful configuration tools are available for both off- and on-line programming and debugging.

The scalability designed into Panorama Station Automation provides the desired level of integration and automation, for immediate needs as well as for future gradual upgrading.



True partnership begins with true understanding.

ABB Network Partner AB has more than 15 years experience of microprocessor based protection with 200,000 units operating in 60 countries. This experience is combined with an in-depth knowledge of power generation, transmission and distribution requirements at a global level. This experience and expertise is brought to every project, big or small. We seek to really understand your needs and translate them into cost effective, efficient operational automation.

Our name embodies our ambitions

ABB Network Partner AB. It means that we don't just provide control and protection systems. Our aim is not just to supply our part of your project, on-time, at the agreed price and within all other criteria, but to also ensure that we blend smoothly with all other components of your systems. Working with other suppliers and systems to ensure a solution which really meets your needs.

This covers all aspects from initial design to commissioning, with training services, total life-cycle support, repair and maintenance services. And not just for new installations, we assist in the gradual upgrading of older systems, expansion of networks and additional functions. So that your investment in Panorama Station Automation is always at its most effective and profitable.

A great system needs great operators - yours.

Any system is only as good as the people who operate it. ABB Network Partner provides a comprehensive range of training services at local, regional and international levels. Courses are available for design, operations and maintenance personnel intended to ensure that all participants on these courses will be capable of designing, modifying, operating and maintaining their own Panorama Station Automation at the highest level of efficiency.

Training on how to operate the power process and its accompanied products improves the possibilities of optimal use of the investment.

High quality training and education are vital parts of our partnership concept.



Technical leadership comes from constant effort

With millions spent each year on research and development, ABB Network Partner AB demonstrates its continuing commitment to the power industry. The company has been developing, utilising and maintaining advanced technology in partnership with its customers and key suppliers since 1905. Working closely with its partners and customers, ABB Network Partner AB uses state-of-the-art off-the-shelf products to create solutions which are expandable, scaleable and upgradeable. The results are tools suited for system migration and local implementation that adhere to formal and de facto international standards.

Why go round the world when we're just round the corner

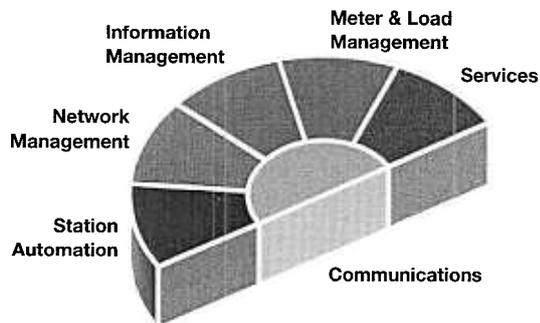
In most countries utility and industry representatives will find an ABB partner at the local ABB office. With over 6000 people in more than 70 countries ABB Network Partner provides the local presence to make certain your project is completed efficiently and effectively. Helping to provide the mutual understanding which is the key to a successful project.

At our headquarters in Sweden we have more than 700 employees and an annual turnover in excess of US\$150 millions. We strive for a constant dialogue with our customers working for a partnership which satisfies everyone.

With vast representation round the world the partnership concept is constantly maintained.

In a true partnership manner we seek to understand your needs and translate them into cost effective and efficient Station Automation.





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