

Success through info

The right information at the right time



ABB hardware and software products for the fieldbus area are open and integrative. Particular attention is paid to data security as well as to integrating data into the overall context of the machine or plant.

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The key concept behind this is providing the right person with access to the right information at the right time and in the right place. The fieldbus and communications products offered by ABB meet this need. IndustrialIT makes each plant com-

ponent a source of information, including intelligent field devices that are integrated into the plant-wide information network by means of sophisticated networking concepts. One of the many intelligent field devices is the wireless proximity switch, which ABB Stotz-Kontakt is the first manufacturer to present.

New sensor technology

The wireless proximity switch opens up new possibilities in mechanical engineering because it finally eliminates the time-consuming task of wiring numerous sensors. What's more, the safety and reliability of the production system is substantially improved because there are no longer any cables that can fray. Typical applications for the new wireless proximity switches can be found on production lines in the automotive industry. Here, robots and assembly machines perform their work in enclosed cells. On average,

fifty proximity switches are used in a manufacturing cell of this type.

Up to now, suitable cables had to be fitted to supply power and transmit signals for each single sensor with a correspondingly high cost for engineering, assembly, and commissioning. During operation, especially in the case of robots, there was the risk that the cable might fray at critical points over the course of time.

Information by radio

Development staff at ABB have now developed a solution that works completely without sensor cables for a range of inductive proximity switches. The information is transmitted by radio in the 2.4 GHz band. The power supply is provided through an electromagnetic field.

Now, in a manufacturing cell it is only necessary to fit cables for the primary loops including the power supply. The magnetic field which is

created is sufficient to supply all the switches in a manufacturing cell with the required power. To achieve this, an especially low-power sensor technology has been developed that only needs 6 mW of power. The link to the controller is handled by input modules, each of which can communicate with up to sixty switches via an antenna.

FBP devices – at home on any bus

The abbreviation FBP stands for FieldBusPlug – and with that a neutral fieldbus connector lends its name to a whole range of new ABB products. Each complete device and function module within the new product range has a neutral fieldbus interface that can be combined with all common fieldbus systems using a special ready-made cable fitted with a bus-specific plug interface. The advantages of FBP technology can be essentially summed up as follows:

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- ▶ Increased productivity in the production and operation of machinery and plants
- ▶ Reduced project implementation times
- ▶ Reduced servicing and shutdown periods

The FBP itself forms the communicating core of the system. As a "smart plug" it interconnects devices and device combinations with different functionality and features and connects standard sensors to regulating controllers. The FBP product range includes various switching and automation modules with different performance levels to suit the specific application, e.g. devices for motor protection and control or standard PNP-NO sensors with an M12 connection.

Smart features in plug

The newly developed FieldBus-Plugs connect individual switching and automation components to the process. One end of the cable has a plug for establishing a connection to other FBP devices. A plug with a fieldbus-dependent interface and a neutral fieldbus connection to the fieldbus-independent switching device or function module is fitted to the other end. The intelligence for "translating" the neutral device data into the data language of the type of fieldbus used is integrated into the compact plug.

Redundancy coupler

Designing redundant fieldbus lines considerably increases the availability of plants or plant components. In offering module RLM 01 (Redundancy Link Module), ABB provides redundant communication channels for the Profibus protocol. Like an active change-over switch, it transforms a Profibus-DP line into two redundant lines or, conversely, combines two redundant lines to form a single line. This also allows to integrate field devices that are equipped with just one Profibus interface to be integrated into redundant lines. In configurations in which the open-loop control only provides single lines, RLM 01 allows redundant lines to be set up.

For users, the RML 01 redundancy coupler gives rise to high-availability plants that can be implemented at a much lower cost than previous Profibus redundancy concepts. Due to the fact that the line redundancy described complies with the Profibus standard, existing PROFIBUS products can be used without restrictions.

FDT/DTM concept

Information supplied by field devices needs to be engineered and evaluated. Conventional field devices are largely configured, parameterized, diagnosed, and optimized using a special tool provided by the manufacturer. As a result of the large number of device types, these tasks are tricky and time-consuming and require numerous different tools. This can be simplified considerably by FDT/DTM (Field Device Tool/Device Type Manager) technology. FDT gives rise to an open, standardized interface allowing system-integrated device management to be carried out for an entire plant. If a system supports the FDT interface, a DTM can then be integrated at any time for the purpose of device management. The DTM itself is the configuration and management tool for a device and has a graphical user interface. Further advantages of using FDT/DTM technology include consistent data retention and a defined data flow throughout the plant. For this purpose, ABB has an extensive range of field devices such as thermometers, flowmeters, positioners, and actuators.

Fieldbus management

The intelligently gathered information must be available in the control system. The suitable IndustrialIT tool for this is called Fieldbus Builder Profibus/Hart. This tool, based on FDT/DTM technology, is used to solve any problems that occur throughout the lifetime of a fieldbus device – from engineering and commissioning to operating, maintenance and servicing. Fieldbus Builder Profibus/Hart is based on the IT concept of Aspect Objects and, since it is incorporated into the Workplace, it



First wireless proximity switch on the market, from ABB

is also integrated into IndustrialIT. Thus, field devices, together with all their information, are transparent for users and allow tasks such as secondary calculations or error analyses to be carried out without difficulty. The field devices can be accessed from the central workplace, which means that costly installations for additional cables or hardware are eliminated.

Functional Focus

Information security, particularly for large installations, is guaranteed by ABB's workplace concept, which focuses on the function. Modern control systems are built up of various elements, ranging from process stations through system buses and fieldbuses to field devices. If components from different manufacturers or from different systems or system generations are used, the system as a whole is heterogeneous. To model an automation system, which is structured in such a way, requires not only tools but also a system architecture that allows all sorts of tools to be integrated on an object-oriented basis. This ensures that all those involved can access the plant information they need at any time through a complete, consistent information flow, throughout the life cycle of a plant.

The Aspect Objects data model forms a kind of data bracket that holds together the information about an asset in a structured form. This model developed by ABB is implemented in the Workplace, the central software component of IndustrialIT. The Workplace then contains various software packages that perform specific tasks such as document management or CAE functions, as well as control system configura-

tion tools such as the IEC-61131-compliant tools for the specific configuration of open-loop controls.

Another important aspect of heterogeneous plant design is the automatic generation of the necessary data channels. This is necessary, for instance, if one part of the application is processed in a controller, while another part is processed by a fieldbus segment. This is done within the Function Designer by simply connecting the function blocks. In integrating the Function Designer into the Workplace, ABB has provided a tool that allows functional engineering of plant components to be carried out regardless of the underlying technology. As a result, users are substantially relieved of the tasks associated with connecting various systems from a data technology viewpoint.

Test center gives its word

The importance, which ABB attaches to create interoperability between IndustrialIT products and the information flow based on them, is demonstrated by the "IndustrialIT enabled" certificate requirements that all products have to meet. The Fieldbus Conformance Center, the first test center for certifying IndustrialIT-compliant fieldbus products, was opened at ABB's site in Minden in December 2000.

The test center examines interaction between the various fieldbus products and makes sure of their unrestricted functionality. The aspects tested are conformity with the IndustrialIT guidelines and interaction between the devices and control systems. In addition to carrying out integration tests, the Minden facility also certifies devices that are incorporated into the control systems using the fieldbus. By now, more than eighty field devices and various system components fitted with one of the three fieldbus protocols (Profibus, Foundation Fieldbus, and Hart) have been certified as being IndustrialIT-compliant.

Find out more about these and other new products at the SPS/IPC/Drives 2002 in hall 4, stands 202 and 211