

MOELLER SOLUTIONS

Automation Solutions for Machine and System Building | 4th Edition

RAPID LINK:

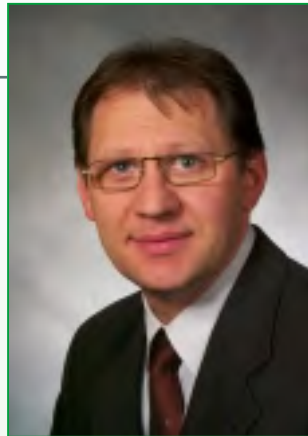
Compact and Powerful at the Conveyor



MOELLER 

Think future. Switch to green.

For Moeller Electric Sales and Support call KMparts.com (866) 595-9616



Imprint

Moeller Solutions
is Moeller's customer publication
with automation solutions for
machine and system building

Published by:
Moeller GmbH

Industrial Automation Division

Editors:
Dirk Wunder (v. i. S. d. P.)
Frank Spelter
INTEGRAL Dr. Schumacher®

Authors:
Roland Kraft
Michael Saat
Dr. Monika Schumacher
Frank Spelter

Hein-Moeller-Straße 7-11
53115 Bonn
Germany

Tel.: +49 228 602-2030
Fax: +49 228 602-2040
e-mail: sia@moeller.net
Internet: www.moeller.net

Copyright 2002 by Moeller GmbH

Reproduction is permitted when the
source is stated

KM 0213-4230 GB

Layout:
eye-eye Raum für Werbung, Cologne

Printed in the Federal Republic of
Germany (11/02)

Article No.: 264312

Dear Readers,

Today's machine and system builders are rethinking their automation concepts. Closing the gap between price pressure and the growing requirements of the customer has become their number one priority.

The fact of the matter is that whoever puts a stop on the innovations of today will lose out on the market shares of tomorrow.

Seamless automation solutions, ranging from WEB-capable touch operator panels to intelligent and decentralized drive controls, offer a decisive advantage over the competition.

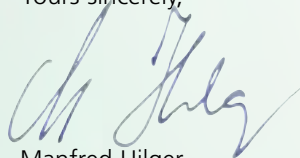
The merging of electronic motor protection with signal pre-processing and fieldbus interfaces into the RAPID LINK decentralized drive control system signals the start of a new product generation of intelligent switchgear.

The fact that RAPID LINK has already been involved in many notable and successful projects has not been down to chance, but rather the result of well-founded experience gained in the field of switching, protecting, power distribution and automation applications.

Curious? In this edition of Moeller Solutions we'd like to present some interesting applications, primarily in the field of materials handling, so that you are up-to-date with the latest developments at Moeller.

I hope you enjoy this edition and that you will find its contents informative.

Yours sincerely,



Manfred Hilger
Head of Materials Handling

Contents

Page 2	Editorial
Page 2	Imprint
Page 3	Contents
Page 3–5	News
Page 6–7	Interview

Materials handling with RAPID LINK



Actebis
Conveying with precision – Actebis with a new logistics concept
 Page 8–9



Fischer plugs
RAPID LINK conveys Fischer plugs
 Page 10–11



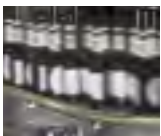
MMS-Logistics
Continuous conveying: RAPID LINK controls material flow in video cassette production
 Page 12–13

Wood processing with EASY



Wema Probst
EASY 800 – solid performance for profiling systems
 Page 14–15

Food processing with XI/ON



Bitburger
Yeast culturing with intelligent remote I/O
 Page 16–17

Microtechnology with HPG 230



Infranor
HPG 230 integrates human-machine interface and PLC
 Page 18–19

+++ NEWS +++ NEWS +++ NEWS +++ NEWS +++



XVision: text display PLC

XVision text display PLCs combine text display functions and powerful PLC functions into one device, and are available as modular or compact devices.

The modular XVision text display PLC consists of text display (XV-100), PLC (XC100) and XI/OC I/O modules. This concept allows components to be simply combined together in the appropriate slots provided. The modular design ensures that users can create exactly the right device configuration for the application in question.

The corresponding XC100 PLC from the XControl Series has a processing speed of 0.5ms/1000 instructions, and is thus a powerful compact PLC for small and medium complexity automation tasks requiring up to 250 I/O. The XC100 features eight digital inputs and six digital outputs directly on board.

The model comes in two different device versions:

- Text display with 4 x 20 characters and 9 function keys
- Text display with 8 x 40 characters and 15 function keys.

The displays can run with a character display height of 5 or 10 mm.

The XVision text display and XVC-100 compact PLC combine minimum mounting dimensions with a high integration density for possible interfaces, such as CANopen, RS232, I/O and technology modules.

The associated XSoft programming software combines programming, configuration, test/commissioning, and visualization functions in one single tool. The flexible programming environment to IEC61131-3 offers the following standard programming languages: IL, LD, FBD, ST structured text, SFC sequential flow chart. A seamless data management function ensures data consistency between the PLC program and the visualization, and thus also ensures cost-efficient engineering.

Touch HMI PLCs from the HPG Series

The touch HMI PLCs integrate a graphical operator panel with a touch screen and a powerful compact PLC into one automation device. This leading edge device concept offers a wide range of automation and networking options. The PLC is programmed in compliance with the IEC 61131-3 industrial standard. The graphical screen masks are designed effectively and simply with the EasyPageMachine (EPAM) visualization tool that runs as a Microsoft Excel plug-in. Standard fieldbus interfaces such as CANopen and Profibus DP are already featured on board. The touch HMI units use Ethernet to communicate with the management level via FTP/HTTP, thus retaining their openness for future developments. Intranet and Internet, as well as integrated WEB servers enhance the functionality



of HPG devices so that they can be used as HMI devices for remote applications. The HPG series features touch displays with screen sizes from 5.7 to 15 inches.

New XControl XC100 compact PLC



The XControl XC100 compact PLC represents another line of devices from the XSystem automation range that Moeller is offering on the market. In the basic unit alone, the devices offer eight digital inputs and six digital outputs, all fully electrically isolated. Additional I/Os can be connected directly to the device. The on-board CANopen interface enables other remote sensors and actuators to be connected easily. The devices also feature a slot for MMC

memory cards, an integrated real-time clock and an RS232 interface. All terminals on the modules are pluggable and are available as screw or cage clamp terminals, as required. A 64 or 128 KByte program memory is provided, depending on the device version selected. The devices can be combined directly with text display front panels (two versions: 4 x 20.8 x 40 characters) in order to form compact MMI-PLC combinations.

NZM circuit-breakers can now communicate

All of the new NZM circuit-breakers with an electronic release store the short-time history of

the circuit-breaker. The Data Management Interface (DMI) enables you to remotely scan and display the diagnostics and operating data of the circuit-breaker station, read current values, assign parameters and control circuit-breaker remotely. A simple

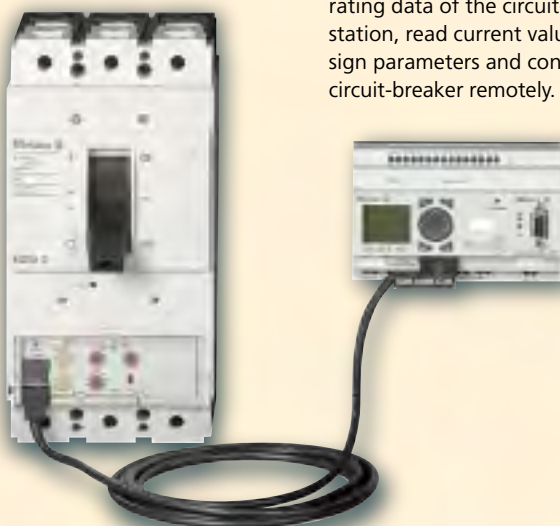
plug connection is used to connect the DMI to the circuit-breaker. In power distribution systems, fieldbus interfaces such as Profibus DP can be implemented to allow users to upload important information for fault, maintenance and diagnostics management to a central control system.

- Fast and selective information on location and cause of power failures (overload or short-circuit) allows fast troubleshooting and saves costs.
- Event-driven information scanning allows preventative maintenance.

Moeller's compact circuit-breakers are more than simple switching and protective devices. The wide range of information made available and the resulting interventions that are possible generate proactive and extensive benefits for the user.

The data transparency thus obtained increases the efficiency of the entire system around the compact circuit-breaker:

- On time evaluation of operating data enables effective process interventions and prevents system failures.



Success Is Not By Chance – RAPID LINK, A Powerful System With A Future

Moeller Solutions spoke with Manfred Hilger, Head of Materials Handling in Moeller System Sales.

Moeller Solutions: Moeller's RAPID LINK decentralized switching and installation system has now been on the market for a year. What were the reasons that brought about the development of this system?

Manfred Hilger: The fieldbus technology, but also the nowadays frequently discussed decentralized control concepts based on Ethernet enable the system builder to implement modular control and system concepts. The benefits of this are obvious. Modularity helps the system builders to accommodate customer requirements with greater flexibility. Standards for software and hardware also help to implement projects quickly and economically. However, it is clear that networked and decentralized motor control cabinets are obviously not the final answer to everything. Meters of motor feeder cables still have to be laid with the associated costs, whilst at the same time taking up valuable production space.

Solutions for this can be developed by combining functionally interrelated sensors and actuators into one automation unit. This can be illustrated very easily in materials handling applications. Logistics centres contain conveyor sections with many distributed motors, sensors and electropneumatic valves. System builders previously installed decentralized control cabinets in the field that used a fieldbus to link up a group of drives as well as the associated sensors and actuators with the main control system. In this way, the control system and the mechanical conveyor belt are clearly separated. The functional interrelationship between the



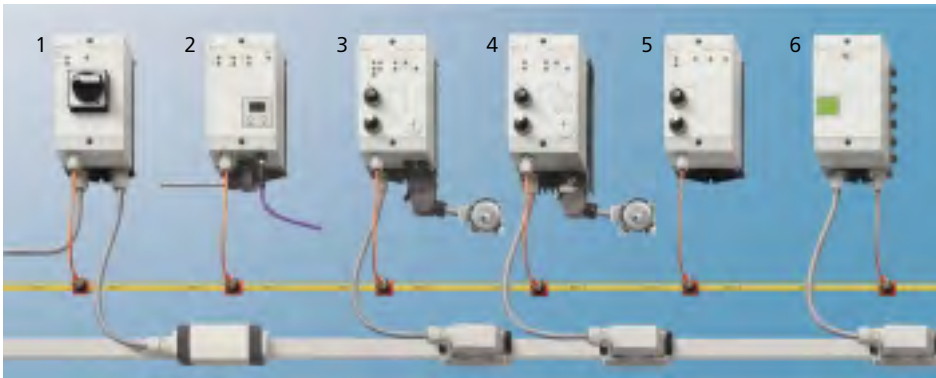
Photo: Moeller, Actebis

sensors, actuators, contactor and motor-protective circuit-breaker, motor and the conveyor section concerned is not established.

RAPID LINK, however, creates automation objects into self-contained subfunctions. The motor starter unit is fitted near the motor directly at the conveyor concerned. It handles the switching and the protection functions of the motor, whilst at the same time its digital inputs collect the relevant sensor signals for monitoring the material flow processes. AS-Interface provides the communication link to the main control system.

Moeller Solutions: What are the benefits of these object-oriented system concepts?

Manfred Hilger: As already mentioned, the conveyor can be regarded as a self-contained subfunction consisting of sensors, motor starter unit and motor. The hardware and software structure can be formed up in the same way. Software function blocks can thus be created that only require parameters in order to provide particular characteristics. Software standards reduce the time required for the design phase. This also applies to the creation of circuit diagrams.



RAPID LINK System Series

- | | |
|--|--|
| 1 Feeder switch
<i>Disconnect Control Unit</i> | 4 Speed regulator
<i>Speed Control unit</i> |
| 2 Head end
<i>Interface Control Unit</i> | 5 Operator Unit
<i>Operator Control Unit</i> |
| 3 Motor starter
<i>Motor Control Unit</i> | 6 Programmable functional unit
<i>Logic Control Unit</i> |

In E-CAD systems such as EPlan, for example, the self-contained structure of the functional units considerably simplifies the representation of a circuit diagram for a drive, whilst macros can also be used to make the process even faster.

All these benefits help to increase efficiency for the system builder, who, in turn, appreciates the fact that the implementation times required for projects can thus be further reduced.

Moeller Solutions: What are the strengths of the RAPID LINK System?

Manfred Hilger: RAPID LINK is the first comprehensive system solution for decentralized drive controls in materials handling applications. Whilst our competitors only offer partial solutions for drive controls, Moeller is offering a complete solution from the power distribution system to the decentralized, intelligent pre-processing.

The Interface Control Unit features a gateway function that allows the RAPID LINK System to be connected with the higher-level fieldbus system. The installation benefits of AS-Interface offer in turn a fast and cost-effective solution for connecting up RAPID LINK units. Disconnect Units are feeder points and maintenance switches for a group of drives. Both units together form the head end for a conveyor section. The Motor Control and Speed Control Unit control the drives with a fixed and variable speed. The Operator Control Unit rounds off the RAPID LINK System, enabling switches, stoppers and pushers to be operated manually. Finally, the Logic Control Unit controls minor functions at the conveyor such as buffering and renewed separating of materials. Our customers are therefore provided with a system that offers absolutely everything for drive control and materials handling applications.

Our two power bus systems also enable us to provide a suitable power distribution concept. The power distribution to the drive can

be implemented using a flat or round cable system. Both systems are provided with interface technology that not only considerably reduces the time required for installation, but also reduces the possible source of errors.

Moeller Solutions: So Moeller is offering RAPID LINK to the system builder as a complete system solution?



Manfred Hilger: That's right. Moeller can draw on its many years of experience in the field of motor protection, switching, control engineering and power distribution. When designing RAPID LINK units we kept to our high standards in quality without making any compromises in the price/performance ratio.

Moeller Solutions: Is RAPID LINK then a synthesis of experience in the market and the company's technical expertise?

Manfred Hilger: Yes, exactly. After all, Moeller is one of the market leaders in the field of switchgear and power distribution. This knowledge was thoroughly utilized in the development of a holistic automation solution for drives in materials handling applications. With RAPID LINK Moeller is promoting the new field of control systems without control cabinets. Already in the first year of marke-

ting RAPID LINK we were able to use it in extensive projects together with well-known conveyor system suppliers such as Swisslog and Siemens Dematic. RAPID LINK plays a key role in the product range and is the start of a new product generation of intelligent switchgear.

Photo: Moeller, Actebis

Conveying With Precision – Actebis With The New Logistics Concept

Actebis Holding GmbH is a company belonging to the Otto Group in Hamburg, and organises the logistics of its German distribution subsidiary, Actebis Computer Deutschland GmbH und Peacock GmbH & Co. KG. A total of eight warehouses at locations in Central Europe were consolidated into two newly designed central warehouses. The extension of the central warehouse in Bad Wünnenberg-Haaren was started in April 2001. This is the location for the development of the new logistics centre for small volume products. The new logistics centre at the company headquarters in Soest is designed for large volume products. From these two location, Actebis, which is active in the IT and telecoms sector, supplies its customers (B2B) in Germany, Austria and Belgium, organises supplies to the ten European subsidiaries with local warehouses and processes all export operations without its own Actebis sales organisations. With over 2,700 employees the Actebis Group achieved a turnover of approximately 4 billion Euros in 2001.

“We will be completing the entire project in October 2002. In view of the lead time scheduled, the investment volume and the client-capable inventory management system, this was the greatest logistical challenge our group has ever faced”, said Hermann Scharl, Director of Logistic Europe for the Actebis Holding. He adds, “You must also take into account that we didn't stop operations at our Bad Wünnenberg-Haaren centre for one single day, and also successfully introduced SAP/R3 within the scheduled project time”.

Central concept: logistics

This is the concept objective in brief: commercial activity should benefit from improved availability, delivery reliability, and reduced storage costs and risk for Actebis. In Bad Wünnenberg-Haaren a new pre-zone with a special replenishment supply function was added to the existing automated high-bay warehouse, as well as a new building with a ground floor, first floor and second floor. The ground floor contained the packaging start, the order picking for priority parts and high volume goods, as well as the dispatch area. The first floor houses the central distribution loop as well as the packaging centre, whilst the order picking for a total of 20 railway stations is processed in two loops on the second floor. The floor area was thus doubled to 32,500 square meters at an investment volume of 40 million Euros. Once

the work is completed, inventory control and management will be carried out for approximately 16,000 of the 50,000 items of the IT and telecom product range. The extension and renovation of the building increases the automation level of the logistics centre for small products. In future, up to 13,000 packages and 250 pallets will be able to leave the centre on peak days. As the general and main suppliers for the system engineering, Swisslog and Siemens Dematic were faced with the task of integrating the complex infrastructure and already functioning system with the requirements of the new objectives. Swisslog programmed the distribution control system for this purpose.

The new logistics centre works according to the so-called “pick-pack” strategy. The goods are allocated directly to the shipping units, either boxes or trays, according to the

volume content calculated beforehand. The box types are started automatically when the order is initiated. For trays this is implemented either automatically or manually. The bar code number of the box or tray is finally assigned to the order concerned. After the order is started, container conveyor systems transport the box or tray to the different workstations in the order picking area. Handhelds inform the order picking personnel which articles are to be placed in the shipping box.

After order picking is completed, the boxes are automatically conveyed to the packing area. The finished package is then placed on the removal conveyor, automatically wrapped, sealed and transported to the dispatch area. The belt conveys the trays to the buffer for starting orders. The dispatch area is divided into package dispatch and pallet



Photo: Moeller, Actebis

dispatch with 15 lorry ramps. Packages are transported to the lorry directly via a telescopic conveyor system. In the pallet dispatch area, the packages are assembled on the pallets and then loaded onto the trucks.

Decentralized concept: AS-Interface and Profibus DP

The decentralized materials handling system uses AS-Interface and Profibus DP for the communication technology. The products of different manufacturers were used that would ensure the optimum solution for the project's requirements: Siemens S7 PLCs, scanners and light barriers from Sick, motors from SEW Eurodrive, Moeller motor starters, crank deflectors and rockers from KEB, AS-I distributors from Murr und Siemens, as well as bus cables from Lapp.

The motor starter: the Motor Control Unit motor starter is part of the RAPID LINK decentralized modular automation system and is supplied as a functionally tested unit that is ready for connection. It is ideal for the rapid commissioning of materials handling systems, and can be exchanged in less than two minutes should a fault occur. The power and data bus also offers fast and trouble-free installation, and features insulation piercing technology throughout. As Thomas Mühlenbein, group manager for Operation and Technology at the Bad-Wünneberg-Haaren centre explains, this is of particular benefit during continuous operation: "The selection of system products was made by specialists in the Otto Group, since a certain standard in product line simplifies handling. We are directly involved with the system and therefore appreciate the connection design of the motor starters. Making terminal and screw connections costs us a lot of valuable time."

Depending on the order volume at hand, the roller conveyors at the Bad Wünneberg-Haaren centre are started at around 9.30 a.m. and are stopped late in the evening. If the throughput is low, the conveyor sections are even shut down and individual packages are left for later transportation. For motors and motor starters the stop and go operation is a test of strength, requiring a high level of robustness and reliability.

Thanks to the electronic motor protection (to VDE 0113), the unit is suitable as a universal motor starter for AC drives rated from 0.12 kW to 3 kW. This simplifies engineering and saves inventory costs for spares. All decentralized Motor Control Units are fed by a power bus that can be implemented either with flat or round cables. If a drive rotates incorrectly due to its mounting position, the rotation direction can be corrected simply by means of

a phase reversal switch. The costly exchange of two phases in the motor terminal box is no longer necessary. The rotation direction is changed on the installation level and consequently has no influence on the control program and documentation.

The drive can also be protected by means of PTC thermistor sensors or bi-metal contacts in addition to the electronic motor protection. The integrated full motor protection is required for drives working in cyclical operation. A thermistor sensor device is already integrated in the motor starter. Electrical insulation between the thermistor signal and the 400V supply (optocoupler) ensures that the 400V supply does not reach the 24V supply.

If another station is to be connected, the power and data bus does not have to be interrupted. Instead, the system can simply be extended during operation. A local fault also has no effect on the overall system: the individual stations are connected in parallel to the power and data bus and are not "daisy chained" (cf. VDI 3581 "Availability of transport and warehouse systems as well as sub-systems and elements"). The Interface Control Unit allows the RAPID LINK System to be connected to different fieldbus systems such as Profibus, Interbus or DeviceNet.

The Motor Control Unit is flexible: it is designed as a direct-on-line or reversing starter. The rotation direction is triggered via the data bus. A DOL starter can be reconfigured locally as a reversing starter if the user requires the other direction of rotation. Two digital inputs can be used if necessary to connect two sensors directly on the motor starter.

Local concept: manual operating level and visual control

An unmistakable system benefit for motor starters in the RAPID LINK System is the HAND-0-AUTO switch on the device. If the higher-level PLC is not functioning properly during automatic operation, or switches off operation, all the belts will be kept automatically at a standstill. The belts can then be run empty using the standard manual operation and rotation direction selector switches



provided. The Motor Control Unit indicates all diagnostics and status information via LEDs. For example, bus errors, the failure of the 24 V auxiliary power, counter clockwise and clockwise rotation, motor fault or the status of the two digital inputs can all be indicated.

Conclusion

The Actebis logistics concept is the result of a European study and a market analysis. All participants involved successfully managed the gradual implementation successfully. All warehouses are to be linked together at the beginning of November 2002 and the conveyor system is then to operate at full load. Hermann Scharl offers the following summary: "At this decisive final stage, we are confident that the technology can now show what it can do." The best automation system is the one that also supports us in the background without preventing us, breaking down or failing. However, we have excellent partners at hand and a number of companies with proven product quality. He adds "Our customers expect a high level of flexibility and reliability from us. We also demand this from the technical side." The RAPID LINK System will also make its valuable contribution.

RAPID LINK Conveys Plugs

The Fischer factories, founded in 1948 by Arthur Fischer in the Black Forest community of Waldachtal, developed into a worldwide company once it was taken over in 1980 by the founder's son Klaus Fischer. The group's intensive development activity and business foresight enabled it to achieve a turnover in 2001 of around 402 million Euros with 3,400 employees in 17 countries worldwide.



Over 1,800 individual inventions and over 8,700 patents worldwide testify to the company's innovative strength. Three company divisions form the pillars of this success story: "fischer fixing systems", "fischer Automotive Systems" and "fischertechnik". The company founder revolutionized the fixing market with the development of the S plug. Today Fischer is still generating the major part of its turnover from this company sector. Fischer has 1,200 employees at its headquarters in Waldachtal – Tumlingen, which is also the location of the fixing systems division with its production areas and central warehouse. Changes in warehouse capacities have doubled the goods turnover within a few years. This meant that the process between incoming goods and the dispatch area had reached its performance limits. Transport in Fischer's central warehouse was implemented exclusively with fork lift trucks, with a transport route of over 100 meters. When the level of fork lift truck traffic was high, the transportation time from incoming goods to the pallet warehouse was over three minutes, compared to a travelling time of one minute when the journey was clear. The objective: to reduce the transport times in spite of the high goods volume and to manage volume increases in the future. Fischer decided to build a 150 meter long pallet conveying system on two floors.

Double the capacity

In single shift operation, the company can now transport 300 pallets from the incoming goods area to the warehouse, and from there to the goods dispatch area. The system is designed for twice the capacity and thus ensures future material transport with high volumes.



Photos: Moeller, Fischer

Every day of building work counts. Only one working week was available for installing and commissioning the first section for the pallet conveyor system. The fast, reliable and simple installation possible was good enough reason to choose Moeller's RAPID LINK system. A further argument was the future security of the system. The switchgear and installation system uses AS-Interface, and the RAPID LINK Interface Control Unit allows it access for all higher-level fieldbus systems.

Fischer uses the flat cable concept for the power supply with a flexible busbar (7 x 2.5 mm²) for 400 Volt /24 Volt. The flat busbar, and the AS-Interface flat cable are laid on the lower level in cable racks. They are electrically isolated, and supply the power to the motor starters, as well as transferring the control commands and diagnostics messages to the PLC. Those responsible for the project at Fischer chose a new strategy with regard to safety: they fully used the AS-Interface for this as well. AS-i Safety was used for Emergency-stop functions. Benefit: no additional cable installation required for the emergency-stop circuit or for the feedback from the individual emergency-stop units.

Reduced installation costs

The second building section was carried out on the second floor. The motors and AS-i stations were installed at a transport height of 2.8 meters. The individual runs for the data and power bus were laid so that the motors and AS-i stations were connected to the runs on the lower level. This considerably reduced installation requirements for

the second building phase.

The RAPID LINK motor starters for both transport levels are installed on the lower level. The low working height involved simplified this installation. The key benefit of this positioning, however, was the continuous operation it allowed: if a fault occurs, for example AS-Interface fault, or a PLC failure, the motors could still be run manually using the Hand-0-AUTO operating element on the motor starter, without having to climb up ladders to the upper level. At the same time, the position on the ground floor allows the motor operating states to be checked quickly via the LEDs on the motor starter. All motors are connected to the power bus and to the AS-Interface via made up cables by means of IP 65 plug connectors. The motor feeder plug is designed according to the Desina standard. The extensive use of plug connections ensures the fast exchange of the motor starter in the event of a fault. As Eckhard Hagen, Sales Logistics manager at the Fischer plants reports, this hasn't been necessary since the system was commissioned and accepted in June 2001.

Conclusion

The Fischer production plants decided on the RAPID LINK decentralized control system in order to be able to plan and operate effectively in the future: this is ensured by the simple installation procedures, the reduced stockkeeping costs, the high level of availability and flexibility in the system. Fischertechnik building blocks and the modular structure of Moeller's RAPID LINK System have at least one thing in common: elegance, but with unmistakable simplicity in design and outstanding technical expertise – each in their own particular field...

Continuous Conveying: RAPID LINK Controls Material Flow in Video Cassette Production

Since 1996 the Berlin-based company MMS Langenberger & Co. KG has been particularly working with material flow systems in addition to manipulating equipment and customized packet systems. The company chose Moeller's RAPID LINK System on account of its simple installation and low engineering requirements, which ensure shorter commissioning times and a high level of system availability.



One system involves the preparation of video cassettes on two conveyor lines, and includes the steps of stacking, separating, attaching labels or covers, placing into the box, sorting by target markets such as free retail sale or bulk purchasers, and, if required, the sealing in cellophane wrappers. RAPID LINK Units control the entire system.

The drive controls are implemented using Moeller Motor Control Units from the RAPID LINK decentralized installation system. The motor starter is designed as a three-phase electronic motor protective device and DOL or reversing starter for motor ratings between 0.12 and 3 kW. This saves the considerable expense of keeping different modules in stock. AS-Interface is used to connect all the units to the higher-level PLC. Switching and control functions can therefore be initiated directly on the system. The simple installation of electrical components was given number one priority at MMS Langenberger. RAPID LINK meets this requirement both on the fieldbus level and in the power distribution. A power bus system based either on a flat cable or round cable design is used to feed all the modules. Benefits of the AS-Interface and power bus concept: both can be installed simply and without faults using plug connectors. The power and data bus are electrically isolated.

Power distribution

Users can choose between two concepts for power distribution. Firstly, the flat cable concept: the profiled cable (7 x 2.5 mm²) supplies the 400V AC voltage and the 24V DC

control voltage for the emergency-stop. A flexible busbar, the seven-core flat cable, is used. On this load feeder sockets can be installed at any point, and fault-free load junctions can be created using insulation piercing terminals. RAPID LINK Units use IP 65 plug connectors to ensure rapid module connection and exchange. The RAPID LINK units offer a high level of plug compatibility.

Secondly, the round cable concept: with this type of power supply system, the power cable simply has to be wired to or from the power distribution box and connected to the terminals. The connection between the motor starter and the power distribution box can be implemented with a plug connector.

Engineering and programming

Previous situation: the more complex the system, the more complicated the engineering and programming. With the RAPID LINK system every motor is assigned its own motor starter directly at the motor, thus keeping engineering and programming requirements to a minimum. This starts with the preparations for commissioning. These include data point tests, the testing of the power supply and bus connections, and the function tests of the individual components. The strengths of the RAPID LINK motor are already apparent at this stage. Motor Control Units, like all modules of the RAPID LINK System, are supplied ex works by Moeller as functionally tested units that are ready for connection. In other words, pre-assembled connection cables, i.e. fieldbus and power



Photos: Moeller, MMS

bus connection and motor feeder, do not leave the production plant until they have successfully undergone thorough quality testing, and are shipped to the user as a fully tested functional unit.

The LEDs on the motor starter indicate status and diagnostics information about bus communication, power supply, clockwise and counter-clockwise rotation, possible bus faults or the tripping of thermistor protection. The manual/automatic operating level is a key feature of the Motor Control Unit. It is used for testing the drive without a bus

connection and without the support of a user program. The HAND-0-AUTO switch also allows conveyor belts to be run empty, using manual operation and the rotation direction selector switch directly at the control unit. If a drive is rotating the wrong way due to incorrect mounting, the direction of rotation can be corrected simply via a DIP switch on the motor starter. The time-consuming reversal of phases on the motor terminal board is no longer an issue.

Conclusion

Flexible and future-proof

The RAPID LINK System used at MMS Langenberger was an unmistakable success on account of benefits such as

- Simple installation for commissioning and servicing,
- Fast and fault-free cabling with the flat cable concept,
- Reduced stockkeeping costs due to the small number of types required,
- High system availability.

RAPID LINK is helping MMS Langenberger to keep flexible. The system uses AS-Interface, although it is open for all commonly available fieldbus systems: the Interface Unit, which is designed as a gateway solution, allows higher-level bus systems such as Profibus-DP, Interbus, CANopen or DeviceNet to be installed with standard hardware. Apart from the gateway function, the Interface Control Unit is also used to prepare the AS-i voltage. RAPID LINK is therefore a sound financial investment offering security for the future.



EASY800 – Solid Performance for Profiling Equipment

Many machine builders are not only selling individual machines but also complete systems. In order to ensure fast and cost-effective engineering, a standard control concept is required for both types of products. Wema Probst, a company based in Freigericht, uses the power of EASY800 for the control of its new profiling system. The new control relay from Moeller also provides networking on board, from which not only the machine builders, but also their end customers can benefit.

Wema Probst Wolfgang Hofmann GmbH was founded by Wolfgang Hofmann, and has been active in the field of round timber processing for over thirty years. Wema Probst machines and systems have been particularly successful in the field of small timber processing. The outstanding feature of this medium-sized machine builder from Freigericht, Hessen, is that its machines can process raw wood from sizes as small as one meter in length.

Individual machines and complete systems

Most machine builders not only supply stand-alone machines but also complete systems that are made up from different individual machines. If a customer orders a complete system, the individual control systems

are often merged into a central control system. Otherwise, customers then require an additional control system that coordinates the individual machines. Result: one system is seldom the same as another, thus increasing engineering costs. After all, every application has to be adapted to specific customer requirements. It's also no easy matter to sell individual machines if they are to support the new project-related functions that are implemented in a central control system. This is the reason why machine builders have the advantage if they don't need to modify individual elements in order to create a system or integrate them into an existing one. This can only be achieved with a powerful networking concept. Something that the EASY800 can provide easily. The Wema Probst profiling system is used in a wide range of applications. For example, it is used for the production of boards for making pallets, the

production of wood for fences or also in the field of timber construction or laminated wood. In other words, complete systems for processing small timber must be adaptable. The profiling system itself consists of three system sections, firstly the wood feed and cut-off saw system (COS), secondly the rod rounding machine (RRM), and thirdly the profiling machine (PM).

EASY800 – a key function in the system concept

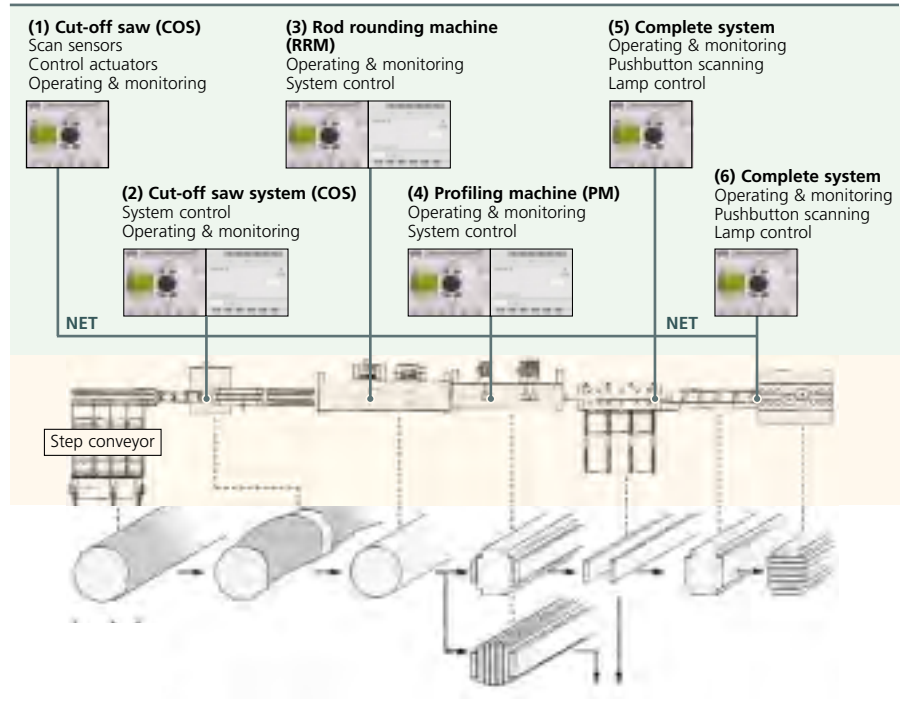
The Wema Probst concept: first of all, every system section should be equipped with its own stand-alone control system. When supplying a complete system, the individual control systems are to be networked to control the entire system. The system should then be operated and monitored from a central control panel. This is what Wema Probst required. "We cannot and must not develop new system controls for each customer. We want to be able to continually create new complete systems from existing elements", was the clear message from Peter Huber, who is responsible for purchasing and electrical engineering.

This demanding control concept can be implemented using the EASY800 control relay from Moeller. The automation concept of the entire profiling system has a modular structure (see figure on next page). The cut-off saw system is fitted with two EASY800s. All actuators and sensors located in the proximity of the graduated conveyor and saw are scanned and controlled by the EASY 800 (1). Field information is processed in a second EASY800 (2) in the COS control cabinet,





Profiling system for manufacturing timber profiles and boards thanks to easy



where the control program for this system section is processed. "The networking involved reduces the wiring requirements. We therefore only have to lay one

bus cable over long sections", reports Peter Huber. The EASY800 units for the rod rounding machine (3) and for the profiling machine (4), each with a local expansion module, also provide complete stand-alone control of the units concerned. Data exchange between the individual machines is implemented via the NET network which EASY800 already has on board, without any additional costs required. As can be seen, a single control concept is enough for Wema Probst to configure individual machines as well as complete systems.

Signalling included

In the central control panel, two additional EASY800 relays (5 +6) are used for operating and monitoring the production process. The backlit 4*16 character LCD displays can also output status and error messages. The integrated keypad on the EASY800 also allows manual operation of the system. Not only the control panel displays messages. A remote message display system is included in the control concept: each EASY800 in the complete system can display messages locally. "This is a decisive advantage", says Jörg Hofmann, technical manager at Wema Probst. "A plain text display at the machine allows us to localise faults quickly and simply together with the machine operator. This has a direct effect on machine operating times. "In other words, the availability of the system must be ensured at any time, as well cannot afford cost intensive faults", explains Peter Huber,

his colleague. This particularly applies to the system users, the customers of Wema Probst.

NET – powerful but simple

The NET network is the basic foundation of the decentralized structure. It is a CAN-based network and is optimised for the data exchange of up to eight networked EASY800 relays. Baud rates of up to 1 Mbit/sec can be run on the network depending on the length of the lines installed. Each station can read the inputs and outputs of another station, without having to send complicated declarations beforehand. The control relay passes on status changes automatically to the network. For example, in order to process input 1 of station 5 in the program of station 3, you just have to place the station address in front of the operand designation (I for input), i.e. 5 I1. That's all. User-friendly function blocks are also available for sending and receiving entire data areas.

Simple programming

Like EASY400 or EASY600, the control and display functions of the EASY800 are programmed in ladder logic or as a circuit diagram. The user simply wires up break contacts, make contacts and contactor coils just like in a conventional circuit diagram. The latest version 4 of EASY-SOFT features a function block display that is used for more complex functions, such as arithmetic operations

or incremental encoder functions. The new software version also features all the functions you would expect, such as complete offline simulation, a 16-channel oscilloscope, or circuit diagram documentation including a cross reference list. Alternatively, EASY800 can also be configured via the integrated LCD display, i.e. without using the programming tool.

With his customers in mind, Jörg Hofmann says "If necessary, the end customer can make small program modifications. This saves us travelling costs and means that the system is operational again more quickly".

Conclusion

The EASY800 control relay is a power pack which, with its new technical features, leaves conventional control relays far behind. The use of EASY800 is now gaining access to areas of applications that were previously the domain of compact PLCs, whilst still retaining the typical features of a control relay such as simple programming and configuration, and extensive hardware and software features.

Yeast Culturing with XI/ON Intelligent Remote I/O



XI/ON, "one Bit bitte"

Bitburger Brauerei Th. Simon GmbH, was founded in 1817, and is now one of the most important premium breweries in Germany. The Bitburger company, with a production output of 4.19 million hectoliters in 2001 is one of the largest premium beer brands in Germany, and is characterised by a blend of tradition with modern management. The company is owned by the seventh generation of the family, and achieved a turnover in 2001 of 371 million Euros.

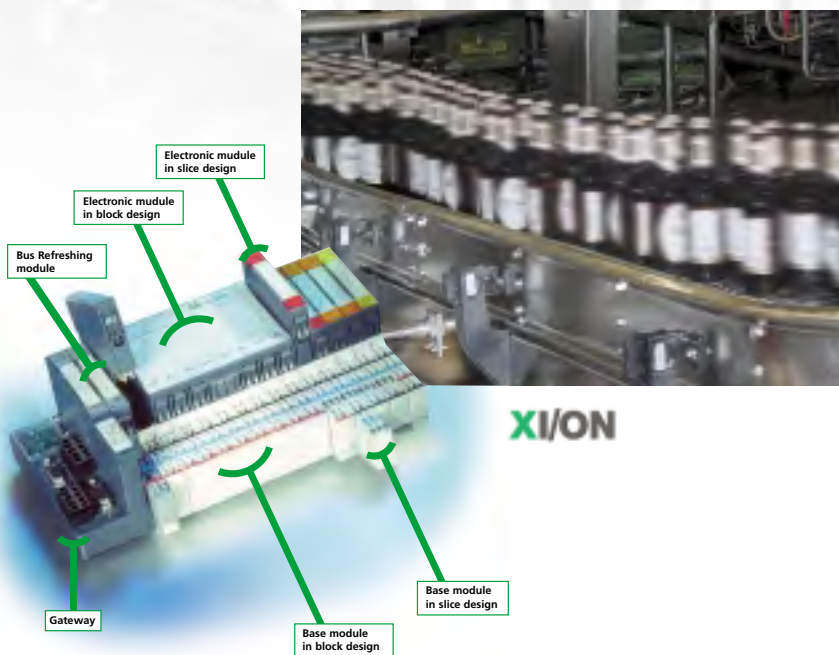


In order to ensure the quality of Bitburger beers from the brewery to the end consumer, the company uses qualified beverage wholesalers to sell its products. Bitburger is represented in 56 countries with over 1,000 specialist wholesalers worldwide. Its consistent quality policy is not only demonstrated by its DIN ISO 9001 certification but also by its analysis technology. Sensors and computers support the work of the brewer in ensuring that customers obtain a constantly high level of quality.

XI/ON in yeast culturing

Short planning, commissioning and maintenance times, minimum documentation requirements, flexibility and future security. These are the requirements that a state-of-the-art automation system is expected to meet with its different components.

The gateway, block and slice structure of the modular XI/ON offers a completely new level of quality in the field of I/O. The gateway offers the user independence from the type fieldbus required: it controls the entire data traffic between the fieldbus and I/O modules. The base modules with a slice and block design are integrated in the connection points for the field level and can be snap-fitted onto mounting rails. Electronic modules, also available in slice and block design, allow the functions required to be simply plugged in. Supply modules provide the voltage (24 V DC or 120/230 V AC) for all connected modules.





Photos: Moeller, Bitburger



The XI/ON System therefore combines slice and block designs to ensure a level of "fine granularity" and thus a compact design. The XI/ON concept gives users the openness and flexibility they need: the gateway, currently available for CANopen, DeviceNet, Profibus and Interbus, links the I/O points configured for the application with the implemented bus system. If the bus system is changed, then only the gateway needs changing. If the fieldbus needs changing, the complete field section of the system can then stay unchanged. This reduces time and cost requirements as well as the documentation required.

Tailored I/O stations

The Moeller I/O system includes a range of standard components such as digital and analog input and output modules, counters and technology modules, and temperature modules. The block modules of the system provide 16 inputs or 16 outputs. These modules reduce the price per channel. Single channels can be added as slice modules. This makes it possible to produce customized I/O stations, allowing analog, digital and function

modules to be combined into clear and logical units. Commissioning or maintenance is carried out using the user-friendly I/Oassistant PC software. This software supports interactive planning and commissioning. Modules and stations can be configured quickly and simply. The tool can also be used to check the plausibility of the application, such as the available auxiliary voltage. The software thus prevents the making of costly planning errors during commissioning. At the same time, the visualization function of the process image and the diagnostics messages support the user in localising faults immediately.

The screw terminal and spring-loaded terminals of the rugged XI/ON base modules ensure that cables are connected securely. The so-called "fixed wiring" reliably separates the mechanical and electronic functions. All electronic modules are simply fitted on the base modules and can be exchanged easily without unscrewing the wiring. The coding between the base and electronic module prevents modules from being plugged in incorrectly. Base modules can already be completely wired and voltage tested before being

fitted. The I/Oassistant software mentioned allows users to check the system in detail for faults and diagnose the connected wiring.

The system also offers flexibility after commissioning: XI/ON modules are hot swappable. This means that during operation users can simply pull out the modules for maintenance or in the event of faults in order to change them.

I/Oassistant – a universal tool

The integrated serial interface is a special highlight of Moeller's gateway concept. The I/Oassistant engineering and diagnostics tool allows users to access the gateway without affecting the current operating status. The I/Oassistant tool not only provides the possibility of local diagnostics, but is also a universal tool that offers the user interactive support during the planning and implementation process of the XI/ON system. The user can create and structure the project on screen, selecting gateways, base or electronic modules or adding accessories. Configuration and parameter assignment of the individual stations can be carried out either offline or online. Later modifications are possible at any time.

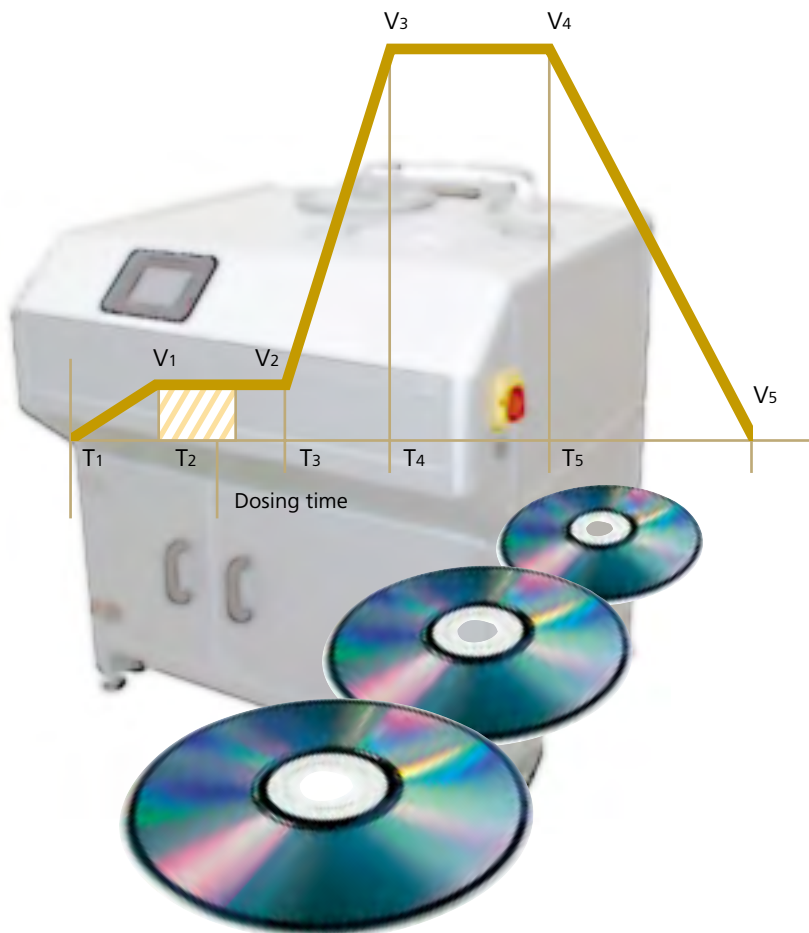
I/Oassistant can also help the user with ordering. A click of the mouse is all that's needed to create an order request for the station required and then fax it on to Moeller. In this way, for example, the user can select the type of housing (stainless steel or plastic) and order accessories.

Conclusion

The Bitburger brewery keeps a keen eye on its automation processes, so that the level of automation implemented meets its requirements exactly. Beer brewing is a logical process and can be broken down into a sequence of several individual steps. These system steps, developed from centuries of individual experience in beer brewing and direct observation, are supported by XI/ON reliably and yet with a degree of moderation. After all, even today beer brewing is not a fully automated process. The company's philosophy gives the highest priority to human experience and creativity, man and machine working together in a team. Nevertheless, the team players ought to be the best they possibly can...

HPG 230 Integrates Human-Machine Interface and PLC

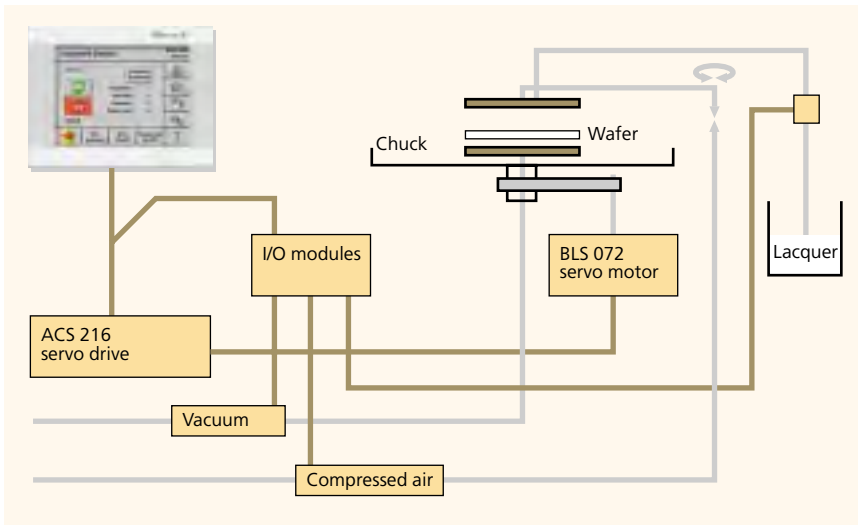
Infranor Inter AG is a provider of automation solutions and equipment and is registered on the Zürich stock exchange. It supplies its customers with servo motors and control solutions. One of its customers is Sawatec the machine builder. Sawatec AG, based in Liechtenstein, manufactures the LSM 300 spin coating module, a semiautomatic system with a manual substrate feed, that is optimised for research and pilot projects. The coat spinner is used for coating silicon wafers with substrate sizes from 2 to 12 inches, and glass substrates of up to 8 x 8 inches with photo lacquer. For its automation solutions, Infranor uses Moeller's HPG-230 HMI-PLC, which features machine controls and machine operating terminal integrated into one device.



The coat spinner uses a pressure-controlled and time-controlled dosing pump to apply the photo lacquer onto the substrate which is vacuum held on the slowly revolving chuck. Depending on the process, the chuck is accelerated to speeds of up to 10,000 rpm in order to ensure an even distribution of the lacquer coating. The operator programs the process cycles via the touch panel, where they can be stored as recipes in a database. The dosing time and the movement profile, defined with up to ten segments by speed and duration, can be programmed for each process cycle. A sensor detects the type of chuck fitted, and the correct controller settings are automatically selected.

HMI-PLC

The Infranor control concept includes servo controllers, high-speed motors, I/O modules and the HPG-230 HMI-PLC. An HPG-230 is designed as a display PLC – a graphical operator panel with a touch screen and a compact PLC combined into one. The processor core is PC-compatible, the data/program memory consists of an exchangeable compact Flash (Type 1 to 128 MB) memory. The HPG-230 offers a 5.7 inch infra-red colour touch display, a CANopen interface, an RS232 and Ethernet RJ45/10 Mbit interface, and also connection to Profibus-DP if required. Users requiring an active display area of 10.4 inches choose the HPG-300. The HPG-200 device series has a compact front design (212 mm x 156 mm, WxH) and offers IP 65 protection.



Object-oriented designing

The device user interfaces of the HPG series can be designed simply and effectively using the Easy PageMachine (EPAM) visualization tool, which enables the user to design screen masks using objects such as buttons, switches, alphanumeric variables, bargraphs or bitmaps. Objects can be configured easily in Microsoft Excel, linked with the appropriate PLC variables and combined to form complete screen pages. All PLC variables are imported from the IEC61131-3 standard. The generated screen pages are then combined together using links, and can then be activated by clicking the appropriate button objects. The Global Process Control (GPC) for EPAM software allows users to establish a link between production and the office world without the need for additional hardware or software components. GPC advances the capabilities of display PLCs to remote HMI units through the use of Intranet and Internet browsers, thus providing a consistent platform for implementing remote diagnostics functions if required.

The HMI-PLC makes it possible to integrate third-party systems, such as remote I/O or drives, into the overall system by using standard fieldbus interfaces. Infranor also utilised this benefit: the servo controller and the remote I/O modules are networked with the display PLC via CAN.

The external mass inertia is considerably greater than the inherent mass inertia of the motor, and with the largest chuck used this is 100 times greater. A status regulator with a load monitor is therefore used in the servo drive.

Conclusion

As a single-source supplier of complete automation solutions, Infranor found Moeller to be an attractive partner. Sawatec machine building required robust control solutions for a range of large mass inertia values and high speeds. Infranor integrated the HMI-PLC into its control concept as HPG display PLCs are designed for use rugged industrial environments. The compact design allowed a range of application versions that were previously not possible due to the space and cost requirements involved. Today's users are calling for flexible products that allow optimal adaptation of the solution to the customer's requirements. This requirement has been met by Infranor, Moeller and finally Sawatec in order to serve the end user.

FAX Reply:
++ 49 228 602-2040

Please send me Moeller Solutions regularly

Please send us information on the following topics:

- | | |
|--|---|
| <input type="checkbox"/> XSystem automation systems | <input type="checkbox"/> Easy 800 control relay |
| <input type="checkbox"/> Compact HMI-PLC | <input type="checkbox"/> Remote I/O XI/ON |
| <input type="checkbox"/> DV5/DV6 frequency inverters | <input type="checkbox"/> NZM circuit-breakers are communication-capable |
| <input type="checkbox"/> RAPID LINK in materials handling applications | <input type="checkbox"/> Electronic catalogue |

Company: _____

Name/First name: _____

Department/Function: _____

Street: _____

Post code/Town: _____

Telephone: _____

Fax: _____

e-mail: _____

Moeller GmbH
Division Industrieautomation
53115 Bonn
Germany

MOELLER

Think future. Switch to green.



Something for Every Taste: The New Flexibility – Automation with XSystem



A good combination: with Moeller's XSystem you have access to new flexible solutions for automation. Make up your individual device combinations to meet your requirements with virtually no restrictions, regardless of whether PLC units, I/O modules or text displays are required. The associated XSoft programming software combines tools for IEC 61131 programming, configuration, test/commissioning and visualization into one.

Moeller GmbH | D-53105 Bonn | Fax: +49 (0) 2 28 / 6 02-2275
E-Mail: xsystem@moeller.net | www.moeller.net

MOELLER 

Think future. Switch to green.