

## CASE STUDY: INDUSTRIAL CONTROL SYSTEMS

**Solution:** Gateway solutions  
**Country:** USA  
**Company:** Sytech Systems  
**Summary:** Anybus® X-gateways create a transparent bridge between Siemens PLCs and Modbus TCP.



### The effects

- ✓ Compatibility with several networks.
- ✓ Re-usable for future network connections.
- ✓ Fast and cost-effective implementation.

### A value added alternative to VME cards to enable network communication

Using the existing Ethernet communications port available on the GE Fanuc family of PLC's and the HMS Anybus® X-gateway™, Sytech Systems was able to create a transparent bridge between the PLC and any commonly used industrial network via Modbus TCP. Thanks to this open and cost effective solution, there was no need to add cards or racks to the system. Moreover, communication is transparent and a communication interface can be created with up to 4000 PROFIBUS slave devices.

Based in Stow in Ohio, Sytech Systems provides complete control solutions. From electrical and control panel design and construction to software engineering. They deliver a turnkey solution including implementation, installation and start up. Sytech Systems integrates hardware and software to achieve manufacturing excellence by using state of the art equipment, technology and methods. Sytech Systems is well known in the industry as an integrator of industrial process control systems: from tunnels deep under the Himalayas to modern steel production plants in Arkansas. They also integrate vision and data acquisition systems as well as MES.

"We work with every major brand of PLC, but creating a bridge between two networks in order to send and receive data is usually problematic and time consuming to accomplish", explains Jeffrey Moore, Senior System Engineer, at Sytech.

"One of our customers needed to interface between a GE Fanuc PACSystems RX7i PLC and a Siemens Simocode Motor Management system operating on a PROFIBUS network". "If there is an open slot in the GEFanuc PLC rack and there is a GEFanuc card or third-party VME card available to make the connection, then creating a bridge between the PLC and the "foreign" network is not too difficult. However, if there is no slot available, then the expense of expanding the current rack or adding another rack can be a costly proposition. Furthermore, some third-party VME cards have a set of issues all of their own, making their inclusion into the application time consuming".

*"In applications requiring a simple information transfer between two different industrial networks, the Anybus® X-gateway™ solution is an option worthy of consideration."*

Jeffrey Moore  
Senior System Engineer, Sytech

In the case of Sytech Systems' client, the problem was that there could be no rack expansion or PROFIBUS communication cards added to the system. "So, we chose to use the Anybus® X-gateway™. It enables us to provide a bridge between the Fanuc PLC Family's intrinsic or existing Ethernet network and almost any other industrial network. As in our client's application, PAC System RX7i Ethernet-to-PROFIBUSnetwork slave devices, Sytech Systems can create a communications path to meet the required specifications."

Thanks to Anybus<sup>®</sup> X-gateway™, there was no need to add Fanuc or third-party VME communications cards to expand the current PLC rack size or to add an expansion rack. Besides this,

Sytech says that this solution had 2 main benefits:

The remotely mounted and independently powered Anybus<sup>®</sup> X-gateway™ uses existing Ethernet communications to exchange data with the Fanuc PLC via Modbus/TCP. No other equipment is required to bridge between the PLC and another network other than the Anybus<sup>®</sup> X-gateway™ and a 24vDC power source.

In the PACSystems RX7i-to-PROFIBUS application discussed above, the Anybus<sup>®</sup> X-gateway™ allows up to 125 PROFIBUS slave devices. As cited in the example, the PACSystems RX7i has up to 32 Modbus/TCP channels. If each Modbus/TCP channel were connected to an Anybus<sup>®</sup> X-gateway™ device, the PACSystems RX7i could potentially communicate with 4000 PROFIBUS slave devices. Furthermore, communications between the PACSystems RX7i and the PROFIBUS network do not add significantly to the PLC sweep time. The PLC is able both to read and write data to and from the PROFIBUS slave devices.

### Implementation was simple

Using our client's application as an example, the Anybus<sup>®</sup> X-gateway™ must first be configured with an IP address as an Ethernet slave. Then it is configured as a Modbus server. Next, the Anybus<sup>®</sup> X-gateway™ must be configured with an image of the PROFIBUS network it serves. After configuration, the device is installed as the "bridge" between the two networks and communications confirmed between the Ethernet-Slave and PROFIBUS Master sides of the device. Finally, programming is added to the PLC application to read, write, and implement data from the "foreign" network. COMREQ function block, command block, and Modbus/TCP channel commands direct the communications between the Fanuc PLC and the Anybus<sup>®</sup> X-gateway™ as well as provide Status Data to monitor the health of the interface.

During the setup of the gateway, the user simply selects the amount of I/O to be transferred between the GE Fanuc PLC and the "foreign" network. Since all industrial networks support a different amount of

I/O data, the network with the least amount of I/O data determines how much data can be transferred in each case. The transfer time between the 2 networks is typically 10-15ms.



The Anybus<sup>®</sup> X-gateway™ family is a product line aimed at connecting almost every possible

combination of two industrial networks. The product family supports 17 different fieldbus networks such as PROFIBUS, DeviceNet, CANopen and CCLink allowing the GE Fanuc PLC family easy data transfer via Modbus/TCP. The X-gateways™ are designed for use in industrial automation plants where increasing numbers of different networks are being used. The X-gateways™ help system integrators to inter-connect any GE Fanuc PLC, enabling consistent information flow throughout the entire plant. The X-gateways™ primarily focus on the transfer of cyclic I/O data between two networks. This can either be a slave-slave combination or a master-slave combination.

The X-gateways™ can bring together the network worlds of GE-Fanuc, Siemens, Rockwell, Schneider, Mitsubishi, Omron, Hitachi, Bosch, Moeller, B&R, Beckhoff and many more.

"By using the Anybus<sup>®</sup> X-gateway™, Sytech Systems can bridge the Fanuc PLC Family to almost any other industrial network without adding more cards or racks to the system. The Anybus<sup>®</sup> X-gateway™ is economical, robust, and proven technology. The "foreign" bus data are easily read and written to by the Fanuc PLC. The flow of information is transparent to the Fanuc PLC application. The status of both the Anybus<sup>®</sup> X-gateway™ and the "foreign" bus may be monitored. In applications requiring a simple information transfer between two different industrial networks, the Anybus<sup>®</sup> X-gateway™ solution is an option worthy of consideration," concludes Jeffrey Moore.

**Learn more on [www.anybus.com](http://www.anybus.com) or [www.sytechsystems.net](http://www.sytechsystems.net)**



### Anybus X-gateways

Anybus X-gateways allow two different networks to talk to each other. In simple terms you could say that it is a real-time translator between any two networks. Gateways solve important industrial communication issues for system integrators working with industrial network design and offer a quick and easy way to connect two otherwise incompatible networks.

HMS Industrial Networks develops and manufactures state-of-the-art hardware and software for industrial communication. Products are marketed within the categories Embedded Solutions, Gateways and Remote Management. HMS was founded in 1988, is headquartered in Halmstad, Sweden and is listed on the NASDAQ OMX Nordic Exchange in Stockholm, ISIN-code: SE0002136242. Anybus<sup>®</sup> is a registered trademark of HMS Industrial Networks AB, Sweden, USA, Germany and other countries. Other marks and words belong to their respective companies. All other product or service names mentioned in this document are trademarks of their respective companies. Part No: MMA608 - © HMS Industrial Networks - All rights reserved - HMS reserves the right to make modifications without prior notice.

Solution: Anybus X-gateways

Country: U.S.

Company: Nagel Precision Inc.

## Case study: Honing machines



### Effects:

- Widens the market for Nagel's honing systems.
- Costs cut in half compared to third party network cards.
- Enables Nagel to focus on their core competence instead of networking.

## Honing machines can connect to any network with Anybus X-gateways

If you create world-leading industrial honing machines like Nagel's, you will get requests from factories all over the world for your equipment. The problem is that this requires you to be compatible with the different industrial networks used in these locations. Developing this connectivity can be a time-consuming and resource-demanding task. Nagel Precision Inc. found an easier solution in Anybus X-gateways.

Nagel Precision Inc. in Ann Arbor, Michigan is the U.S. subsidiary of German Nagel Maschinen- u. Werkzeugfabrik GmbH. They create machines for honing, superfinishing, and deep hole drilling which are used to manufacture engine blocks, transmissions, pinion gears, valves and other metal artefacts which require a very smooth surface. The machines are installed in manufacturing plants around the world by companies such as GM, Chrysler, KIA, Hyundai, and Ford to name but a few.

### The network dilemma

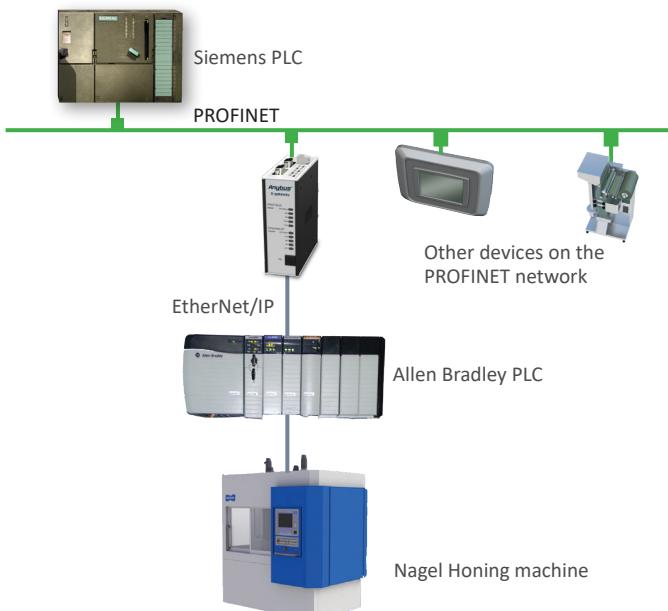
Nagel Precision's machinery is built on an EtherNet/IP-based control system with an Allen Bradley PLC, often with the Rockwell Kinetix 6000 Multi-Axis Servo Drives as the pivotal core. However, since the honing machines are exported to factories all over the world, Nagel was faced with the problem of how to communicate with other networks – especially PROFINET which is frequently used in car manufacturing plants.

"We first started out with third party network cards," says Jim Saule, Information Technology Director at Nagel Precision Inc." However, these were a bit cumbersome since they required a lot of configuration and were also quite expensive. It was also sometimes hard to find the correct card. That's when I started investigating into the Anybus X-gateway from HMS. I liked the fact that you could support several different networks with the same configuration – something which would save us a lot of work."

*"The Anybus X-gateways enables us to focus on our core business – building honing machinery – rather than working with compliance for different networks."*

**Jim Saule, Information Technology  
Director at Nagel Precision Inc.**

## Connecting Nagel's honing machines to a PROFINET network



The Anybus X-gateway allows Nagel's Allen Bradley PLC to communicate with any other industrial network. The above example uses a Slave-Adapter X-gateway between the EtherNet/IP-based equipment on the top rack and the PROFINET-based equipment on the bottom rack.

### Costs cut in half

About two years ago, the first Anybus X-gateways were installed in Nagel Precision's systems. The solution was delivered by HMS's distributor in Michigan – McNaughton McKay Inc. The possibility to focus on the core business instead of network connectivity has been an important decision parameter for choosing Anybus – not to mention the fact that the gateways are half the price of the third-party cards.

"We don't want to understand every type of controller out there," says Jim Saule. "We'd rather focus on perfecting our honing machines. Anybus X-gateways has allowed us to do just that. Furthermore, the third party network cards cost us about 1200-1500 dollars each, now we're down to around half that cost for a gateway."

### How it works

If the honing machine is to be installed in a factory that runs EtherNet/IP, it can be connected directly and communicate

with the network. But if the factory runs another network (for example PROFINET), an Anybus X-gateway is needed. The gateway works as a translator between EtherNet/IP and the factory system and "translates" parameters such as positioning data, status of the drives, start/stop commands etc. The communication stream is transparent on both sides of the gateway making the honing machine a separate node on the factory floor, fully able to communicate with the plant-wide network.

"We've been using the Anybus X-gateway for more than two years now and it has been flawless," says Jim Saule at Nagel Precision. "I have been designing these types of systems for more than 20 years and really appreciate the fact that HMS can support several different networks with the Anybus X-gateway. This enables us focus on our core business – building honing machinery – rather than working with compliance for different networks. I would definitely recommend any machine builder to look into Anybus, the variety is great and there are substantial savings to be made," finishes Jim Saule.



### Learn more on [www.anybus.com](http://www.anybus.com) or [www.nagelusa.com](http://www.nagelusa.com) Anybus X-gateways

Anybus X-gateways allow two different networks to talk to each other. In simple terms you could say that it is a real-time translator between any two networks. Gateways solve important industrial communication issues for system integrators working with industrial network design and offer a quick and easy way to connect two otherwise incompatible networks.

## CASE STUDY: VISUAL INSPECTION SYSTEMS

**Solution:** Gateway Solutions  
**Country:** Italy  
**Company:** SPAMI/Stevanato  
**Summary:** Anybus® X-gateways provide a link between smart cameras with Ethernet connections and Siemens PLCs on a Profibus network.



### The effects

- ✓ Instant connection between Ethernet and Profibus
- ✓ Quick set-up time
- ✓ Easy to connect to other networks later on

## Production of glass containers for pharmaceutical use

SPAMI, a company forming part of the Stevanato Group, has developed an inspection system to improve the quality of glassware. It uses quality control technologies to screen the glass tubing on arrival at the plant as well as the final product. The system includes a visual inspection system (NoVIS), a system for continuous temperature measurement, and also a digital image processing system, called CLEANER, which is able to detect and remove defects in the glass as small as a few microns in the final product. The fully integrated process machinery provides measurement of glass tube diameter, wall thickness, and temperature using infrared pyrometers (Pyrometer Annealing control) for total quality control, and motorised burners provide close control of their positioning.

Founded in 1949 as an artisan workshop in a region with a strong tradition in the art of glass-making, Stevanato Group is now an established industrial enterprise producing high technology systems.

The group comprises two divisions. The Glass Division specialises particularly in the production of primary packaging of glass tubing for pharmaceutical use. It offers a wide range of products from the most traditional primary packaging, such as ampoules and vials, to rapidly growing products such as cartridges for self-injectors and pen-injection systems, including sterile ready-to-fill syringes.

The Engineering Division, made up of the companies S.P.A.M.I. and Optrel, focuses on the design and production of machinery and equipment for the conversion, visual inspection and monitoring of glass tubing containers. The synergy between the two divisions ensures that the Stevanato Group has full control over the entire production process, from the purchase of the raw materials right down to after-sales support.

The mechanical and electrical solutions installed on the forming machines have been designed to provide the greatest precision and the best results in the production of glass containers.

All the components used to form the molten glass are installed and carefully checked to guarantee the dimensional tolerance of vials, syringes, cartridges and ampoules. The components installed in the forming machines and conveyor belts have been specifically

*"We are very satisfied with our choice. HMS's Anybus products are very sound, functional and simple to use compared to other similar devices that we tried",*

Marino Gobita

Responsibile for S.P.A.M.I.'s  
Electrical Technical department.

selected to avoid contaminating the containers. The process is fully automatic, from the loading of the tube to boxing.

The production cycle starts with the glass tubing which is acquired externally in pieces of approx. 1.5 m in length and with an appropriate diameter for the size of the finished product. The glass tubing is fed into rotary forming machines with several processing heads and is heated by burners. Depending on the processing cycle, which is selected according to the product to be made, the mouth and the bottom of the vial, ampoule, syringe, etc. are formed in this way.

#### **The following equipment is installed on the line:**

Downstream of the forming machines is a conveyor belt where dimensional and cosmetic inspections are carried out by means of cameras to ensure a thorough check of the glass containers. "These are basically dimensional measurements carried out by analysing the image", Gobita explained. "Since the product is subject to mechanical stress during processing, there is also an annealing oven providing a heat cycle to eliminate the tension formed in the glass." Then the final stage comprises quality control of the finished product and automatic packaging. It should be noted that this final part of the cycle is carried out in such a way as to ensure the levels of quality and sterility required for use in pharmaceutical applications.

There are a number of competitors on the market that operate at international level. "Our main competitors are German and American, whereas the other companies in Italy are much smaller than ours", explained Gobita.

The value added offered by S.P.A.M.I. is to be found primarily in the quality of its products, which has enabled it to excel in this sector. "Since they are used in pharmaceutical applications, our products have very high quality requirements and have to comply with very stringent regulatory limits. This requires a large number of very qualified Quality Control staff", continued Gobita.

"The difference between us and our national competitors can be seen in this very aspect. Our capacity for research and development is also a factor: when pharmaceutical companies ask us for trial products that are different from the standard products, we can do the product design because we can modify our systems. Just like the mechanical division which produces the systems within the group, S.P.A.M.I. can modify and adapt these systems to suit production requirements. This ability to customise systems is another important value added we can offer our customers. It should be remembered that there are a number of standard products in the pharmaceutical sector, such as ampoules and vials that we all know about, but there are also many special products - and their numbers are increasing - that for the most part are developed ad hoc. In these cases, a specific machine is needed, so in the majority of cases a pre-existing machine has to be modified".

#### **A positive collaboration with HMS**

The association with HMS came about in order to resolve a specific communication problem.

An application was developed by the mechanical division to carry out a series of product quality checks based on machine vision technology. More specifically, Cognex smart cameras had to be connected to Siemens PLCs. "We thus needed to enable cameras with Ethernet interface to communicate with PLCs with Profibus protocol", explained Gobita. "After some careful research, and through EFA Automation, the exclusive distributors in Italy of HMS's GATEWAY solutions, we singled out the Anybus devices which enabled us to solve the problem of communication between our equipment."

Other potential suppliers were considered at the time, but HMS was the only company that could offer a wide range of protocol converters.

"This widespread availability was central to our choice, because our various applications are often very different from each other. Initially, for example, we needed to manage the Profibus protocol since it was used by Siemens PLCs, but our company normally also uses programmable controllers from other suppliers. So it is essential for us to have an extensive product range."

The first HMS product used was a device from the range of Anybus converters that converts from Profibus to Modbus on Ethernet: the Anybus X-gateway.



More than one Anybus converter may be installed on each production line. "Up to now we have used a number of converters, because the application has been used in various systems", continued Gobita. "Smart cameras are used to check the product's various quality aspects and must be installed in several different points in the system. Basically, this is not a "one-off" application of HMS converters, but an application that has become standard for us."

"We are very satisfied with our choice. HMS's Anybus products are very sound, functional and simple to use compared to other similar devices that we tried. We all know that while it's very easy to find complex things, it isn't so easy to find simple things. We haven't had any problems and the way things have developed is also down to this. In the future we plan to use the HMS Anybus converters also on other lines, where they will of course be closely linked to our control systems via cameras. And, since standards require increasingly narrow tolerances, it is inevitable that checks by means of remote cameras will increase", concluded Gobita.

## CASE STUDY: INDUSTRIAL AUTOMATION

Solution:	Gateway solutions
Country:	Italy
Company:	C.I.A. Automation and Robotics
Summary:	Anybus® X-gateways provide robots with connectivity to several industrial networks such as for example Profibus and DeviceNet.



### The effects

- ✓ Instant connection to any network.
- ✓ Quick set-up time.
- ✓ Easy to connect to other networks later on.

### Automation: a ‘must’ to be able to compete on the global market

C.I.A. Automation and Robotics has extensive experience in the field of advanced automation, proposed as a strategic tool to increase the competitiveness of Italian companies in the world. It offers advanced technologies such as laser scanners, stereoscopic vision equipment and systems that can reproduce a die and copy it directly, automatically recomposing the scanning scattergrams, a very differentiating solution. As most of C.I.A Automation and Robotics applications are specific, they have to interface different kinds of devices in their automatic systems that use different communication protocols. They have chosen HMS's Anybus X-gateway which enables them to adapt to any communication protocol easily.

"We have produced automation systems, testing benches and machinery managed by PLCs and Scada systems for the foodstuffs, chemical, glass, plastics, metalworking, metallurgical and automobile industries", explained Mr Angelo Galimberti, the sole director of C.I.A. Automation and Robotics. "As well as many other applications, such as robotised stations for servo-mechanical machinery, palletisation lines, assembly lines and processing lines such as for handling, cutting, hot and cold pressing, welding, tacking, induction, brazing, deburring, etc."

C.I.A operates in a modern environment with a covered production area of 2300 sqm, equipped with the latest equipment and machine tools. The commercial and administrative offices and the mechanical and electronic design departments cover an area of 750 sqm. The company has two-dimensional, three-dimensional, electrical and electronic CAD systems and programming software for all the main kinds of PLCs, robots and supervisors.

A staff of engineers and mechanical, electronic and IT technicians develop all the projects and write the documents which are filed according to CE standards, while a group of specialised technicians and fitters carry out the assembly, testing and any maintenance of all the equipment produced. C.I.A. is a certified company with a computerised system which can guarantee the immediate retrieval of any information from any of its systems quickly and easily even after several years have passed.

*"This need for flexibility in diverse design conditions led us to try HMS products, which we appreciated immediately because they are particularly comprehensive and can be used to interface different kinds of machines, even pre-existing machinery."*

Angelo Galimberti,  
Director of C.I.A. Automation and  
Robotics.

## High value added

"Our company is involved in industrial automation in general and with robotised automation in particular", Mr Galimberti said. "We produce a number of different systems for a vast range of applications. For example, we operate in sectors ranging from the pharmaceutical industry to packaging, foodstuffs, the mechanical sector, and so on." "Almost all our applications are specific to some extent, because we deal with special equipment, produced ad hoc according to the customer's specific requirements", continued the director of C.I.A. "So we are like system integrators, since we design and integrate automation systems intended for all over the world." Some examples of applications implemented in various sectors can be seen on the company's website ([www.ciaautomazione.it](http://www.ciaautomazione.it)).

During the recent BIMU (the biennial machine tools fair) held in Milan last October, C.I.A. Automation and Robotics was represented on the ITIA CNR (National research council) stand, where it showcased some highly innovative systems characterised by the use of advanced technologies such as laser scanners, stereoscopic vision equipment and systems that can reproduce a die and copy it directly, automatically recomposing the scanning scattergrams. "No other company in Europe can offer this technology, which we have patented together with CNR", Mr Galimberti stressed. "Ours is a long-standing collaboration relationship. We have funded some of CNR's research and have produced robotised stations for various kinds of processing, while some of CNR's researchers have been involved in innovative developments and mathematical calculations. Even in the simplest of applications, such as the robotised loading/unloading of machine tools, we work with the same level of attention which has enabled us to develop these high-level applications."

The value added of C.I.A.'s solutions is above all in its ability to automate production cycles using advanced systems so as to make Italian companies competitive on the world market. It is a well-known fact that it is currently practically impossible to compete with factories in the East or China without automation: our labour costs are much too high and this is one of the reasons that many companies are moving their production overseas. With its automated systems, C.I.A.

Automation and Robotics is trying to ensure that certain processing activities, which would not otherwise be feasible to carry out manually in Italy because they require too much manpower, can compete with similar activities provided by far eastern countries.

## Opting for flexibility

C.I.A. Automation & Robotics got to know about HMS products and especially the line of Anybus-X-Gateway converters a few years ago, through a supplier of automation components. "We started using HMS devices in our applications almost straight away", explained Mr Galimberti, who added: "Very often, we have to interface different kinds of devices in our automatic systems that use different communication protocols. For example, we typically use robots with DeviceNet interface and PLCs with Profibus interface. This need for flexibility in diverse design conditions led us to try HMS products, which we appreciated immediately because they are particularly comprehensive and can be used to interface different kinds of machines, even pre-existing machinery."

Before opting for HMS products through EFA Automation, the exclusive distributors for Italy of HMS's GATEWAY solutions, the Albiate-based company also assessed what other suppliers had to offer. Selection criteria centred around the functionality and flexibility of the devices in particular, but the performance/price ratio was also part of the equation. The technical and economic features of the HMS Anybus family came out on top and C.I.A. has effectively adopted these devices on a permanent basis.

"We have produced various equipment with Profibus master PLCs and DeviceNet slaves, or with DeviceNet master PLCs and Profibus slaves, and so on", said Galimberti. "HMS products have enabled us to resolve and simplify a number of these applications. The protocols we use the most are Profibus and DeviceNet, which cover almost 90% of the cases we deal with involving robots and PLCs."

He added that C.I.A. was satisfied with the performance of HMS products and that no major problems were encountered. "I believe that we will continue to find space for HMS products in our future applications, whenever we need to interface system parts that use different communication protocols", concluded the director of C.I.A. Automation & Robotics.

**Learn more on [www.anybus.com](http://www.anybus.com) or [www.ciaautomazione.it](http://www.ciaautomazione.it)**



## Anybus X-gateways

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Solution: Anybus X-gateways

Country: Sweden

Company: SVIA  
(Svensk Industriautomation AB)



### Effects:

- Quick and easy to connect a robot cell to any network.
- Cheaper than using a robot cabinet with multiple networks installed.
- Clear cuts between the robot cell and the end user's network.



*"DeviceNet is the standard we use in most of our cabinets and instead of handling the conversion to other networks ourselves, we simply install an X-gateway from HMS."*

**Anders Mandorsson**  
Project Manager & Design,  
SVIA

### Networking made easy for SVIA

"OK, so how do we solve this?" Anders Mandorsson thought when he was informed that the PROFIBUS-system which he was promised access to, suddenly proved to be off limits. He now had to find another way to get his DeviceNet based robot system to communicate with the customer's PROFIBUS network. The solution he found was an Anybus X-gateway from HMS.

#### Seeing robots

Svensk Industriautomation (SVIA) is a fast-growing automation company in Jönköping, Sweden, developing robot systems for customers in the Nordic countries, Germany, U.K., the Netherlands, and the U.S. The systems are put together to robot cells which are able to communicate with other systems in a factory for example. The core of the robot cell is SVIA's own vision system called Pickvision, which detects exactly how a particular object is placed on a conveyor belt and thereby enables a robot to pick up the object. In simple terms, you could say that SVIA enables robots to see. This revolutionary technology has become very popular on the automation market and has enabled SVIA to double its turnover during the past few years.

"Our strength lies in the simplicity," says Anders Mandorsson, Designer and Project Manager at SVIA. "It is very easy to tell the robot what to pick from the carrier belt, and then you are ready to go." By using the Pickvision software, users take a picture of the object which is to be picked from the belt. The software automatically detects the shape of the object and every time this shape shows up in the camera, the robot is able to determine how to pick it up.

As most advanced automation systems, SVIA's robot cells need to communicate with some kind of plant-wide industrial network and this type of communication is not always hassle-free. "A couple of years ago, we built a robot cell for a customer who promised me access to their PROFIBUS system, but after a while, it became clear that our system was only to be a separate node in their network. That's when we found Anybus X-gateways from HMS. We tried installing one into our cabinet and it handled



An Anybus X-gateway handles the conversion between the robot cabinet's DeviceNet system and the end customer's PROFIBUS network.

the conversion between our DeviceNet based system and the customer's PROFIBUS system in a very elegant way," says Anders Mandorsson.

Since then, SVIA has used Anybus X-gateways in many of the robot cells they deliver to customers around the world. Once again, simplicity is key. "DeviceNet is the standard we use in most of our cabinets and instead of handling the conversion to other networks ourselves, we simply install an X-gateway from HMS. It is cheaper, but above all, it makes it easier for the customer since he gets a clear segregation between our system and his own factory network," says Anders Mandorsson.

## How it works

SVIA's robot cells usually come with robots from ABB which operate on a DeviceNet based network. The robots can easily communicate with another DeviceNet network, but if they are to be connected to another network, for example a PROFIBUS network (with a PLC from Siemens) or an EtherCAT network (with a PLC from Beckhoff) a "translator" is needed. Anybus X-gateways handle the conversion between the two networks through built-in software which restructures the telegrams from one side and make them understandable on the other side. The configuration is made in a matter of minutes by using the Anybus Configuration Manager software which means that no programming is necessary.

## Flexibility

SVIA's robot cells are very flexible and can easily be adjusted to cater for different customer applications such as mounting, packaging, drilling and lathing. Through Anybus

X-gateways, SVIA can also be very flexible when it comes to the network they can connect to. "To be honest, we don't really think much about networking anymore," says Anders Mandorsson. "When we create a robot system, we simply order the X-gateway which converts to the customer's industrial network — we plug it in and it works."



In Pickvision, the operator decides what to pick from the conveyor belt. A photo is taken of each item and the software identifies the shapes.



When the robot cell is in operation, a camera in the ceiling monitors the belt...



...and makes it possible for the robot to know exactly what to pick, and how to pick it up.