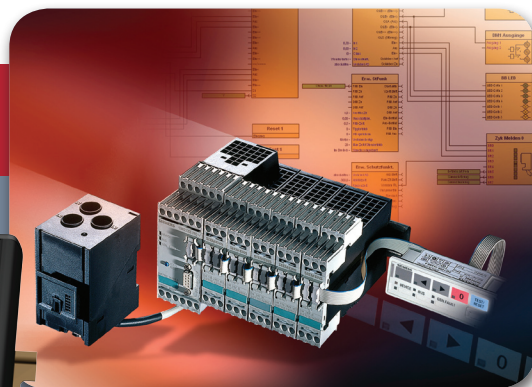


## CASE STUDY: INDUSTRIAL CONTROL SYSTEMS

**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 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."

*"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



Thanks to Anybus® 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® 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® X-gateway™ and a 24VDC power source.

In the PACSystems RX7i-to-PROFIBUS application discussed above, the Anybus® 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® 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® 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® 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® 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® 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® 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® 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® X-gateway™ and the "foreign" bus may be monitored. In applications requiring a simple information transfer between two different industrial networks, the Anybus® 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.

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