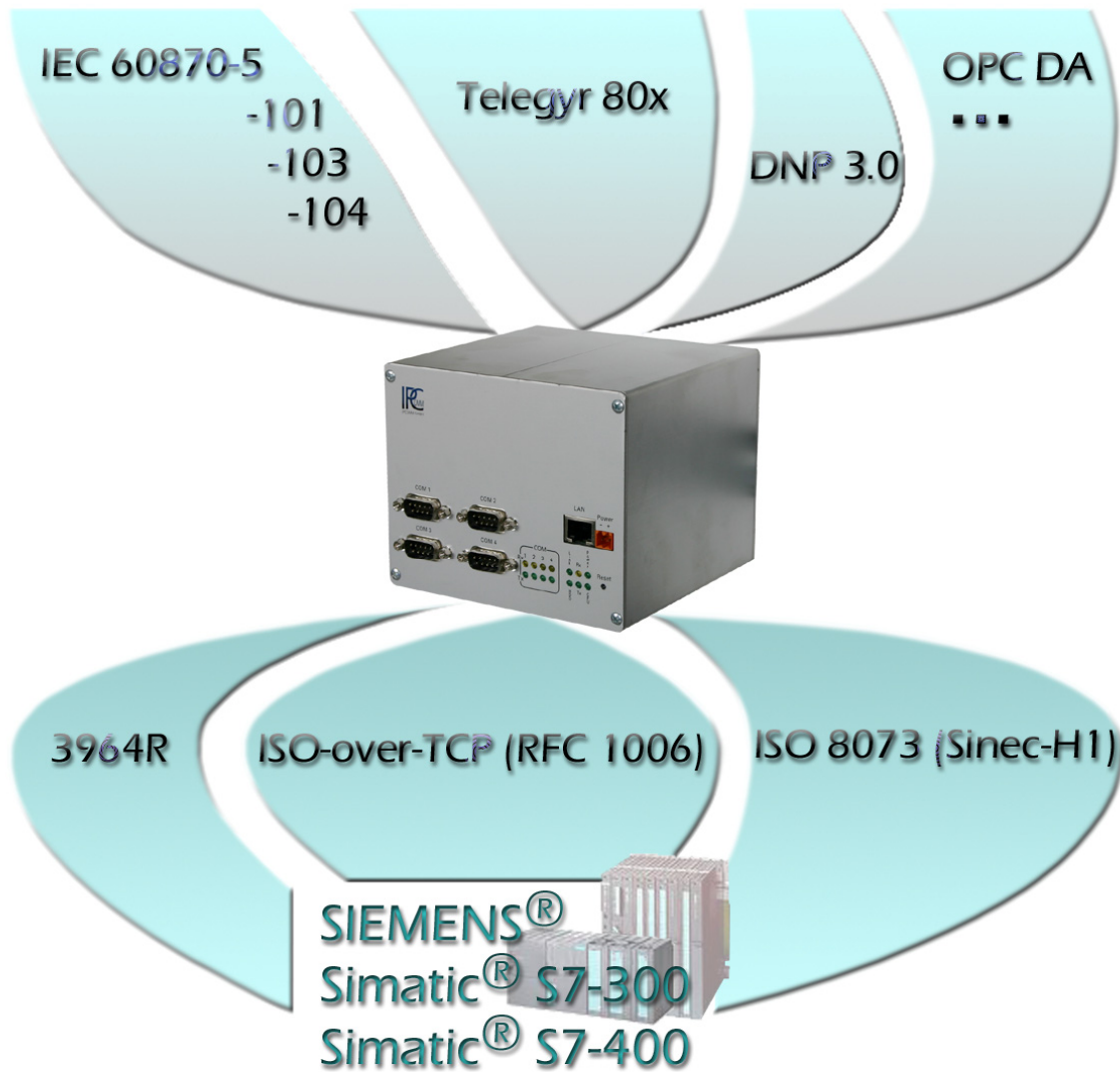
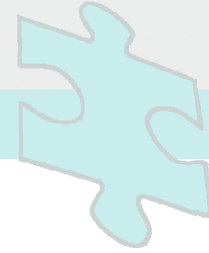


ipConvLite

SIMATIC S7 – Ethernet Gateway



THE CHALLENGE

SIMATIC S7-300/400 industrial automation systems have been designed for a wide range of applications in different industries. S7 programmable logic controllers (PLCs) handle all kinds of process monitoring and control tasks.

SIMATIC S7 PLCs provide various communication modules enabling the coupling of third-party systems for visualization and data processing. Unfortunately, not all third-party systems are equipped with a communication module that allows data communication with SIMATIC S7.

Now this is exactly where the easy-to-install, efficient and attractively priced IPCOMM solution comes in.

THE SOLUTION

The [ipConvLite](#) gateway (protocol converter) offers a universal solution for integrating Siemens devices in the SIMATIC S7-300/400 series via a wide range of protocols, such as IEC 60870-5-101, IEC 60870-5-103, IEC 60870-5-104, Telegyr 809, OPC and more.

The physical connection of a SIMATIC S7 PLC to the communication module is established through an Ethernet interface.

There is no need for modifications of any (existing) SIMATIC S7 programming to set up the connection.

THE SOFTWARE

The SIMATIC S7 PLC's FETCH/WRITE interface is used for connecting with the workstation or network, providing direct access to data blocks, data I/O sections, flags, I/O for peripheral devices, timers and counters.

No modifications of the SIMATIC S7 programming are required, all that needs to be done is to provide for the installation of an additional networking connection.

There is a wide choice of transport protocols available for data retrieval from the PLC controller and communication:

- TCP
- ISO-over-TCP (RFC 1006)
- ISO 8073 (Sinec-H1)
- 3964R

You can freely customize the FETCH/WRITE services to suit your needs by defining the length and location of the data area and even access cycles.

The data are retrieved as separate information objects and can also be dispatched as separate information objects. SIMATIC addresses and target protocol addresses can be freely assigned, the data volumes to be transferred can be reduced to a minimum.

Simply enter the individual data points in an Excel sheet and import the table - easy configuration the [ipConvLite](#) way. Of course, the [ipConvLite](#) standard functions also include data point processing, scaling and conversion.

Time stamps can be added locally to the information objects in the [ipConvLite](#) protocol converter. Precise clock synchronization for time stamps can be ensured either by the protocol (such as the IEC 60870-5-101 or 104), by NTP (**N**etwork **T**ime **P**rotocol) or an external GPS/DCF77 module which feeds the radio time signal to [ipConvLite](#).

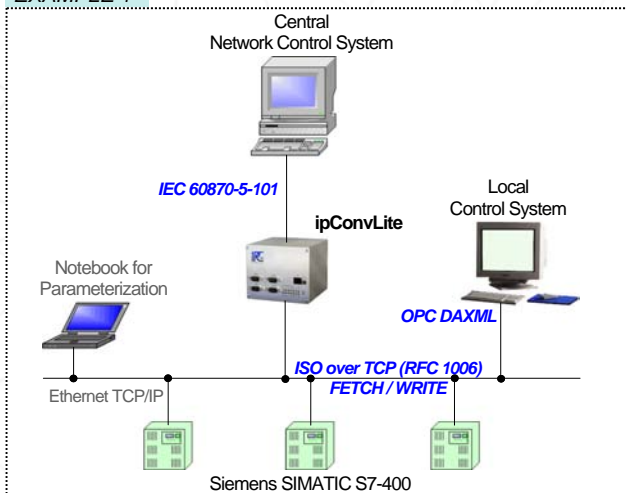
Information objects include quality descriptors based on the current connection state to the SIMATIC S7 controller. If the IEC 60870-5-101 or a similar target protocol is used, all information objects dispatched after a SIMATIC S7 connection failure are transmitted as "invalid" or "not topical". So once the connection is up again, all data points are sent to the process control system with their current value and the "valid" quality descriptor.

THE ADVANTAGES

- Direct access to all SIMATIC S7-300/400 data sections.
- No SIMATIC S7 programming required.
- Quick and easy installation in existing operating environment, without any interruptions.
- Supports simultaneous connection of multiple PLC controllers.
- Configurable data areas and access cycles.
- Information object based access. Data are dispatched as data points, not data blocks.
- Gateway can be used with all implemented protocol stacks.
- Gateway can serve as a node for simultaneous communication with several devices using multiple protocols .
- Time stamping on change of data value (configurable).
- Clock synchronization via the protocol, NTP or an external GPS/DCF77 module.
- Full support for redundant operation.
- Redundant networking with highly available SIMATIC S7 controllers.

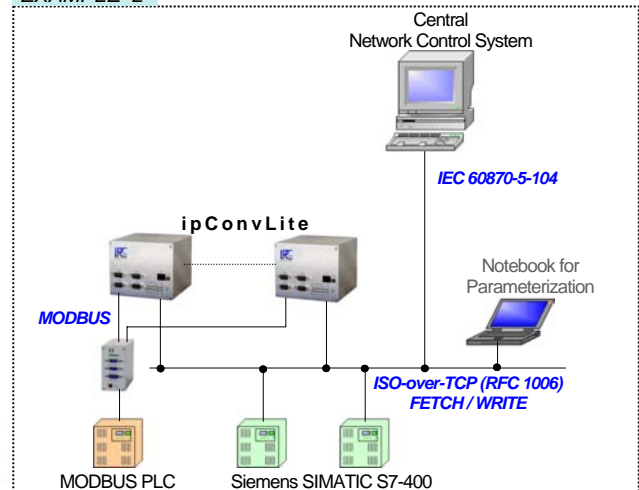
Example Applications

EXAMPLE 1



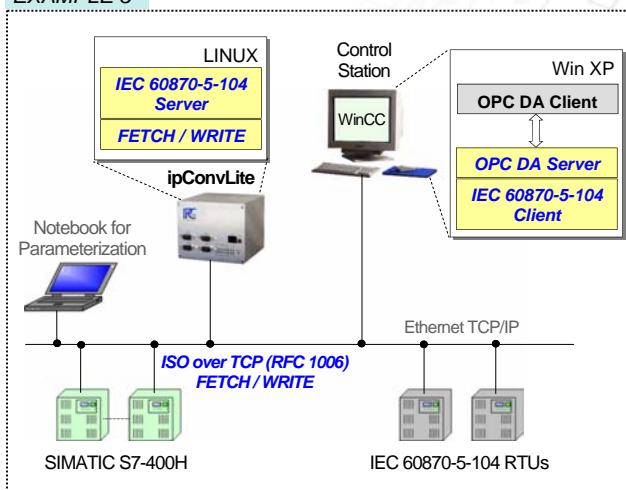
In this application, multiple SIMATIC S7 automation devices are linked up with two process control systems. ISO over TCP (RFC 1006) is used for data transmission. After conversion to the relevant protocol, the data are dispatched to the local control system using OPC DAXML. The central network control system retrieves the data via the IEC 60870-5-101 protocol.

EXAMPLE 2



This is an example of redundantly operating gateways that connect SIMATIC S7 to the process control system. For the redundant connections you can choose between an RS232 interface or an Ethernet interface. The active device is continuously monitored by the passive unit. If the active device fails, the passive device is triggered and takes over communication (hot standby). Communication also involves an additional PLC based on the MODBUS protocol. SIMATIC and MODBUS PLCs are capable of direct data exchange.

EXAMPLE 3



Here we have a redundancy of highly available SIMATIC S7-400H PLCs connected to a WinCC control station.

At first the conversion is done between the FETCH / WRITE interface and IEC 60870-5-104 protocol. The IPCOMM software solution ipConvOPC, which runs on the control station, allows the IEC 60870-5-104-based connection to the control station. The internal WinCC communication uses the OPC interface.

Direct communication between SIMATIC S7-400 and the control station via the OPC interface was not an option in this case for a good reason. Interconnecting the IEC 60870-5-104 protocol makes the system operation much more flexible. Additional IEC 60870-5-104 RTUs (controllers) from a wide variety of manufacturers can be easily and quickly added to the system - simply by making a few changes to the configuration.

SUPPORTED PROTOCOLS

ipConvLite Protocol Stacks

Protocol	Configuration	Interface / Profiles
DNP 3.0	master / slave	PCM async
Harris 5000/6000	slave	PCM async
Hitachi HC 4300	master / slave	PCM sync
HNZ 66 S11/15, T63	master / slave	PCM async
IEC 61850	server	TCP/IP
IEC 60870-5-101	master / slave	PCM async
IEC 60870-5-103	master / slave	PCM async
IEC 60870-5-104	master / slave	TCP/IP
Indactic 2033	slave	PCM sync
Indactic 33/41	slave	PCM sync

Protocol	Configuration	Interface / Profiles
MODBUS RTU	master / slave	PCM async
MODBUS TCP	master / slave	TCP/IP
OPC DA	client / server	TCP/IP
OPC DAXML	server	TCP/IP
SEAB 1 F	master / slave	PCM async
Sinaut ST1	slave	PCM async
SNMP	client	Ethernet
Telegyr 809	master / slave	PCM async

Other protocols on request.



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