

# CC-Link In Action

OPEN NETWORKS

## CC-Link reduces noise levels and energy costs on Building Management System

**AGSY TEC, a German based specialist building Technology Company have utilised the power of the latest Open fieldbus, CC-Link, for one of their customers to totally automate and link four factories and one office building on a single Building Management System.**

Before the new Building Management System (BMS) was installed all the buildings facilities had to be operated by hand. These facilities included lights, heating, windows, window blinds, presentation screens and a host of other functions.

Most people do not appreciate that using a manually operated building facilities system can at times be more expensive to operate than a totally automated one. But when viewed from an energy management perspective the long term cost savings of using an automated BMS system can be considerable. Apart from giving precise facility control, the use of the new BMS system also enhances security of the buildings as it can immediately indicate if windows are left open.

Old BMS systems do not allow for energy efficient heating of the rooms, nor do they compensate for hot spots created by other factors such as sunlight.

The new Building Management System from AGSY TEC changes all this with a new approach to the technology. It uses the latest in high speed automation to ensure precise real time control of all building facilities.

Mr. Heuchemer, Product manager for AGSY TEC states "We chose to use CC-Link at our customer's site as it has a remarkable tolerance to electro-magnetic noise. We have used other networks but CC-link worked without noise or expensive cabling and expensive earth precautions. Another reason we used CC-Link was because it was extremely fast, not just in network speed but actual speed of response due to its low overhead protocol. This high speed will allow us to expand the system at a later date without having to slow down or re-configure the network. A major advantage for us is that it allows us to offer customers the ability to connect to building controls and machines over the same network, dramatically reducing installation costs".



The site system consists of 4 micro PLCs connected back to a central modular PLC via CC-Link running at 10 mega baud per second. The central PLC takes care of all co-ordination, monitoring and reporting for the overall system. Each Building has its own independent PLC giving localised intelligent control, which is needed in order to ensure the system operates even if the network gets interrupted between buildings.

Each of the local PLC stations uses digital and analogue signalling to control a building. The stations use PT100s to input temperature data into PID loops in the PLC which calculate temperature heating and cooling, ensuring the buildings are heated efficiently. Each Temperature control loop uses clever damping which prevents the loop control switching heaters on and off every time a door is opened or people move within a room.

The whole BMS system is completely intelligent and has time-channel switching of all elements. Time-channel switching increases energy saving by allowing the rooms facilities to be turned on and off at particular times. The system uses this information to calculate the optimal timing for gradual raising of the building's room temperatures to the required level, rather than having to turn the heaters on full to heat the room in a short period, greatly saving energy.

Every room has a dual temperature sensor, with one in the north and one in the south. The System compensates area temperature changes due to sunlight heating through the windows, again adding to energy savings.

Connected to the centralised master PLC is a PC running AGSY TEC's own Visual Basic monitor and control software. From this central PC system operators can check status (such as which windows are open etc.) and change any building element and their associated set points from a central position.

For localised control of presentation facilities in the customer's conference room, AGSY TEC installed a small touch key HMI. The HMI allows the presenter from a central presentation position to close blinds, open/close windows, change all room lighting, lower projection screens, and change heating levels (which include normal radiator and a sub floor heating system).

To avoid unnecessary network traffic, the remote stations send back digital data when states have changed, but all analogue data such as temperature etc. is reported back on a real-time basis to the central master.

Christoph Lohmn, installation and service manager for AGSY TEC comments "With CC-Link we can remove station cabling when the system is running with any problems as the network is very industrialised. What we liked about

CC-Link from a maintenance point of view is that we can programme the network and connected stations over a modem connected to the master PLC. This allows us to offer the customer a very competent after sales maintenance and service, and diagnose problems remotely before going to site".