

# Engenuity

## S Y S T E M S

### STD32 & LonWorks

This same system architecture has been implemented for two different Engenuity customers using two different operating systems (VxWorks and Windows NT) and varying combinations of hardware and I/O. The system incorporated five 486-based embedded computers, four at the control level and one to implement the Host/Human Interface (see diagram below). These computers communicated with I/O through the LonWorks networks and with one another using Ethernet. The system is capable of handling over 600 Analog and/or Digital I/O points and can be implemented independent of application software and computing platform.

The system is segmented into several layers. At the top is the supervisory level, which performs overall control and data logging as well as provides the human interface. Beneath the supervisory layer is an embedded control level, which performs specific embedded functions for various parts of the system. Each of the four embedded controllers has an independent LonWorks network connected to the I/O level and an Ethernet connection back to the supervisory controller. The lowest level is the I/O level which includes the Data Acquisition and Control functions implemented by the LT-DACM (LonTalk Data Acquisition and Control Modules). Sensors and Actuators are connected to this level on one of four LonWorks networks. Engenuity supplied everything needed to implement each LonWorks network which included Embedded Network Management software, an STD-NSS10 LonWorks Network Management and Interface board, and up to six LT-DACM's per network.

Messages can be sent to I/O devices using acknowledged messages, unacknowledged messages, or a combination of both. The I/O control modules (LT-DACM's) are completely interchangeable using the same, reprogrammable device with onboard addressability.

The system's software consisted of several layers ranging from human interface to I/O objects. Engenuity was responsible for everything from the application interface down through the I/O. This included the following layers:

Custom Software developed to provide the layer of communication between the application and the rest of the system. It interfaced Honeywell's ControlWave software with Engenuity Systems' ENM software. Embedded Network Manager provided the API and managed the LonWorks networks. It performs functions such as installation of nodes, binding of variables, and automatic discovery of new nodes making field replacement simple and cost effective.

Driver and/or DLL software, which handles OS, board, and other hardware specific functions.

I/O objects for handling signal conditioning and various I/O configurations for the I/O devices and the LT-DACM's.

For More Information Please Contact:



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