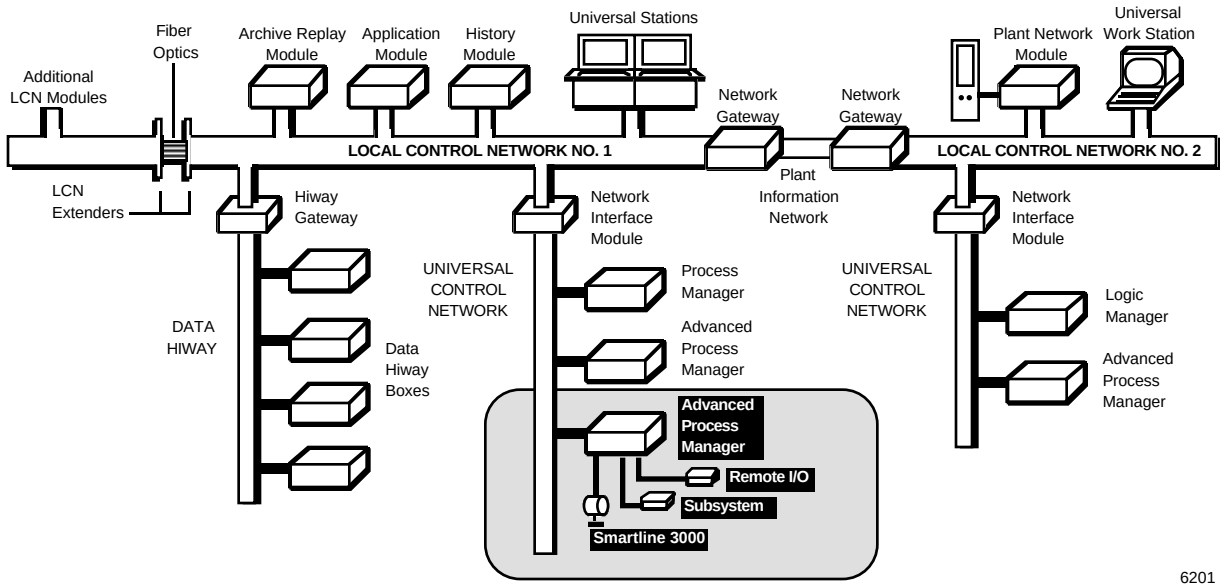

Figure 2 — TDC 3000^X Architecture

Introduction

The Advanced Process Manager (APM) is Honeywell's premier TDC 3000^X data acquisition and control device for industrial process applications.

Like the Process Manager™ (PM), the Advanced Process Manager's new-technology platform offers a range of capabilities that best meet today's and tomorrow's process requirements. The APM offers highly flexible I/O functions for both data monitoring and control. Powerful control functions, including regulatory, logic, and sequencing control are provided for continuous, batch, or hybrid applications.

An optimal toolbox of functions that can be configured and programmed meets the needs of data acquisition and advanced control requirements in a highly secure and performance-intensive manner. Of course, APM's capabilities include peer-to-peer communications and compatibility with industry-standard communications protocols.

As seen in Figure 2, the Advanced Process Manager is a fully integrated member of the TDC 3000^X family. Accordingly, it is capable of:

- Performing data acquisition and control functions, including regulatory, logic, and sequential control functions, as well as peer-to-peer communications with other Universal Control Network-resident devices.
- Providing bidirectional communications to Modbus™ and Allen-Bradley compatible subsystems through a serial interface.
- Fully communicating with operators and engineers at Universal Stations and Universal Work Stations. Procedures and displays are identical or similar to those used with other TDC 3000^X controllers. Plant personnel may already be familiar with them.
- Supporting higher level control strategies available on the Local Control Network through the Application Module and host computers.

Advanced Features

As described above, the APM has the same functionality of the PM plus:

- Digital Input Sequence of Events (DISOE) processing
- Device Control Points
- Array Points for CL Programs
- Foreign device (serial) interface capability
- Larger Memory (over four times larger than the PM)
- String Variables
- Time Variables

Universal Control Network

The communications channel for the Advanced Process Manager is a local area network called the Universal Control Network (UCN). Introduced to TDC 3000^X users in 1988, the UCN is the platform for process I/O connections to the TDC 3000^X.

™ Process Manager, Looptune-II, SP$_Q$C-II, and Logic Manager are trademarks of Honeywell Inc. Modbus is a trademark of AEG Modicon.

The UCN features a 5 megabit per second, carrier band communication system with a token bus network. It is designed to be compatible with IEEE* and ISO** standards. UCN communications are consistent with the growth and direction of evolving international standards, with appropriate Honeywell extensions for secure process control applications.

The UCN uses redundant coaxial cables and can support up to 32 redundant devices. The UCN supports peer-to-peer communication between devices on this network. This feature enables sharing information among Advanced Process Managers, Process Managers, and Logic Managers on the network, thus offering tremendous power and flexibility in implementing advanced, coordinated control strategies.

Network Interface Module

The Network Interface Module (NIM) provides the link between the Local Control Network and the Universal Control Network. Accordingly, it makes the transition from the transmission technique and protocol of the Local Control Network to the transmission technique and protocol of the Universal Control Network. The NIM provides LCN module access to data from UCN-resident devices. It supports program and database loads to the Advanced Process Manager and forwards alarms and messages from the network devices to the LCN. The NIM is also available in a redundant configuration to provide automatic continued operation in the event of a primary failure.

LCN time and UCN time are synchronized by the NIM. The NIM broadcasts LCN time over the UCN. The APM uses it for all alarm (or event) timestamping.

Functional Description

Functional Overview

The Advanced Process Manager is designed to provide flexible and powerful process scanning and control capabilities. To do this, it uses advanced multiprocessor architecture with separate microprocessors dedicated to perform specific tasks. As depicted in Figure 3, the APM consists of the Advanced Process Manager Module (APMM) and the I/O Subsystem.

The Advanced Process Manager Module consists of an Advanced Communication Processor and modem, Advanced I/O Link Interface Processor, and Advanced Control Processor. A redundant APMM can be optionally provided.

The Advanced Communication Processor is optimized to provide high-performance network communications, handling such functions as network data access and peer-to-peer communications. It also supports high-accuracy time stamps.

The Advanced Control Processor is the APM resource dedicated to executing regulatory, logic, and sequence functions, including an excellent user programming facility. Because communication and I/O processing are performed by separate dedicated hardware, the full power of the Advanced Control Processor can be applied to control strategy implementation. The Advanced I/O Link Interface Processor is the APMM interface to its I/O Subsystem.

The I/O Subsystem consists of the redundant I/O Link and up to 40 redundant I/O Processors. These I/O Processors handle all field I/O for both data acquisition and control functions. For example, the I/O Processors provide such functions as engineering unit conversion and alarm limit checking independent of the Advanced Process Manager Module.

The Smart Transmitter Interface processor provides full bidirectional communication to Honeywell smart transmitters, supporting transmitter configuration and improved data accuracy.

All control operations are performed within the Advanced Process Manager Module, with all data acquisition and signal conditioning being performed in I/O Processors. For added control security, the High Level Analog Input, Smart Transmitter Interface, and Analog Output processors can optionally be supplied as redundant devices. The remote I/O option allows I/O Processors to be remote-mounted up to 8 kilometers from the APM file. This option uses redundant fiber optic I/O Link extenders.

The process engineer has complete flexibility of choice in the assignment of point types and control strategies, within the maximum APMM design limits. These selections are implemented using the interactive tools provided by both the TDC 3000^X Universal Station and Universal Work Station.

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* Institute of Electrical and Electronics Engineers

** International Standards Organization