

Overall System Description LonWorks® UMCS/DDC

This document provides a basic overview of the Utility Monitoring and Control System (UMCS) and local building direct digital control (DDC) system specified in UFGS-13801 and UFGS-15951, respectively. The overall approach is based on LonWorks® open-systems technology which consists of a variety of devices and tools available from a wide variety of manufacturers. Figure 1 illustrates the basic architecture.

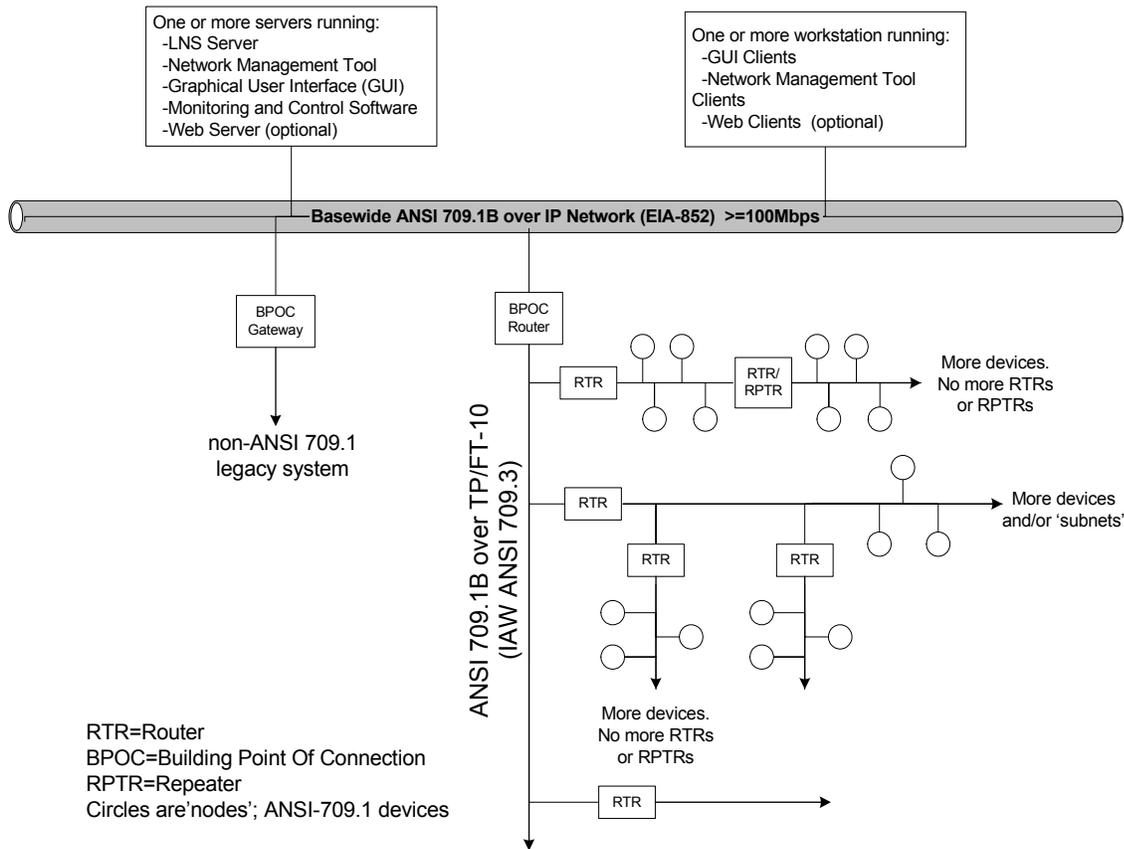


Figure 1: UMCS/DDC Network Architecture

Protocol/Topology:

The building level control network uses the ANSI/EIA-709.1 (sometimes referred to as LonTalk®) communications protocol over a TP/FT-10 network in (double-terminated) bus topology. Communication between devices is via Standard Network Variable Types (SNVTs).

The UMCS (campus-wide network) uses ANSI/EIA-709.1 over an IP network as specified in ANSI/EIA-852. The Internet Protocol (IP) network may be furnished by the Government, installed by the contractor or be a

combination of the two.

An ANSI/EIA-709.1 to EIA-852 router provides connectivity between the building and the UMCS. In these specifications, this router is referred to as the Building Point of Connection (BPOC).

Network Database:

Both the UMCS and building-level networks use LonWorks Network Services (LNS[®]) as the network operating system/database standard. A single (or few in the case of a larger system) database(s) will be maintained at the UMCS for the entire campus-wide network.

UMCS Monitoring and Control (M&C) Software:

The UMCS includes M&C software which provides an operator interface and supervisory monitoring and control functionality such as graphical display of the building-level systems, alarm handling, trending, demand limiting, and real-time pricing.

Scheduling:

Scheduling of equipment is primarily performed by the M&C Software through hardware in the building executing the System Scheduler sequence of operation. The System Scheduler also provides backup scheduling capability in the event of a loss of communication with the M&C Software Server.

Trending:

Trending is performed by the UMCS M&C software via SNVT.

Alarm Handling:

Alarms are generated locally by the building controls and sent to the UMCS via SNVT. The UMCS handles these alarms by sending them to a user display, email address, a pager, or printing the alarm information. The building-level control network can provide redundant alarm handling for extremely critical alarms.

Control Hardware:

Application specific configurable DDC hardware must be LonMark certified and provided with an LNS plug-in. The plug-in is used for control application configuration of the device. General purpose programmable controllers (GPPCs) must be provided with the controller programming software and a copy of the installed application program.

Contractor Responsibilities/Integrating Buildings and UMCS

The building contractor is responsible for:

1. Installing and verifying functionality of a control system capable of operating/controlling the building.
2. Ensuring that the building system is capable of being integrated into a UMCS by:

- a. Ensuring that SNVTs needed by a UMCS are available for binding to the UMCS.
- b. Preparing and submitting a 'Points Schedule' for all systems in the building (all DDC hardware) which details I/O (hardware and SNVT) for that system.
- c. Submitting an LNS database for the building network.

The UMCS contractor is responsible for:

1. Installing an "ANSI-709.1 TP/FT-10 to IP" Router to connect the building to the UMCS.
2. Merging the building database into the campus-wide database.
3. Establishing network variable (SNVT) bindings between the UMCS and the building network.
4. Updating the UMCS network configuration software to include the building-level database.
5. Configuring the Monitoring and Control software to provide an interface to the building-level system.