Introduction

This chapter describes the basic functions and operation of an N30 Supervisory Controller (N30). It also provides the foundation you need to monitor and control your facility using the N30.

This chapter includes:

- N30 concepts
- descriptions and illustrations of the Building Automation System (BAS) components
Key Concepts

N30 Supervisory Controller

The N30 monitors and controls HVAC equipment in your facility. It provides powerful data gathering and energy management tools, such as Totalization and Demand Limiting, which can improve the cost efficiency of your facility. The N30 is optionally available with an integral Local Display Terminal (LDT).

N30 Capabilities

You can complete the following BAS functions with the N30:

- schedule BAS actions
- set up calendars, including exception and holiday calendars
- monitor facility conditions
- detect and respond to alarms
- control equipment and automate routine functions
- collect trend and totalization data
- reduce energy consumption and costs

BAS Components

A typical BAS configuration consists of the components listed below and illustrated in Figure 2-1 and Figure 2-2.

- Multiple N30 Supervisory Controllers (with or without optional Local Display Terminal [LDT])
- VT100 Terminal/Terminal Emulator
- Ethernet Local Area Network (LAN)
- N2 Bus (field bus or controller bus)
- serial printer
- N2 controllers (Table 2-1)
Supported Application Specific Controllers (ASCs)

The N30 supports all current N2 devices except the N2 Dialer. This includes Metasys® (AS) and Facilitator™ (FA) models and support for the Variable Air Volume Modular Assembly (VMA) 1400 Series controller. Table 2-1 shows the firmware version of all currently supported ASCs.

Note: Metasys Integrator® (MIG), Variable Air Volume (VAV), Unitary (UNT), and Air Handling Unit (AHU) controllers with older code revisions are not allowed on an N30 system. They are forced offline when detected.

Table 2-1: Firmware Revision of Current ASCs*

<table>
<thead>
<tr>
<th>Device/Controller Type</th>
<th>Revision</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>DR-9100 1.x</td>
<td>Room Controller</td>
<td></td>
</tr>
<tr>
<td>DR-9100 2.x</td>
<td>Room Controller</td>
<td></td>
</tr>
<tr>
<td>DC-9100 1.x</td>
<td>Plant Controller</td>
<td></td>
</tr>
<tr>
<td>DC-9100 2.x</td>
<td>Plant Controller</td>
<td></td>
</tr>
<tr>
<td>DO-9100 1.x</td>
<td>Digital Optimizer</td>
<td></td>
</tr>
<tr>
<td>DX-9100 1.x</td>
<td>Digital Controller</td>
<td></td>
</tr>
<tr>
<td>DX-9100 2.x</td>
<td>Digital Controller</td>
<td></td>
</tr>
<tr>
<td>TC-9100 1.x-3.x</td>
<td>Temperature Controller</td>
<td></td>
</tr>
<tr>
<td>TEC1100 1.x</td>
<td>N2 LCD Thermostat</td>
<td></td>
</tr>
<tr>
<td>XT-9100 1.x</td>
<td>Extension Module</td>
<td></td>
</tr>
<tr>
<td>XTM-101 1.x</td>
<td>Extension Module</td>
<td></td>
</tr>
<tr>
<td>XTM-105 1.x</td>
<td>Extension Module</td>
<td></td>
</tr>
<tr>
<td>XTM-905 1.x</td>
<td>Extension Module</td>
<td></td>
</tr>
<tr>
<td>LDT A08 or later</td>
<td>Local Display Terminal</td>
<td></td>
</tr>
<tr>
<td>LCP-xxx All</td>
<td>Lab and Central Plant Controller</td>
<td></td>
</tr>
<tr>
<td>MIG 3.0 or later</td>
<td>Metasys Integrator</td>
<td></td>
</tr>
<tr>
<td>UNT B03 or later</td>
<td>Unitary Controller</td>
<td></td>
</tr>
<tr>
<td>VAV A03 or later</td>
<td>Variable Air Volume Controller</td>
<td></td>
</tr>
<tr>
<td>AHU C03 or later</td>
<td>Air Handling Unit Controller</td>
<td></td>
</tr>
<tr>
<td>PHX All</td>
<td>Phoenix Interface Module</td>
<td></td>
</tr>
<tr>
<td>VMA1400 All</td>
<td>VAV Modular Assembly</td>
<td></td>
</tr>
<tr>
<td>VND (Vendor Devices) All</td>
<td>Metasys Compatible (by others) including TEC1100</td>
<td></td>
</tr>
<tr>
<td>ILC** All</td>
<td>Intelligent Lighting Controller</td>
<td></td>
</tr>
<tr>
<td>IFC-1010/2020 All</td>
<td>Intelligent Fire Controller</td>
<td></td>
</tr>
</tbody>
</table>

* Some controllers are unique to a local market and may not be available on a global basis.

** Information for ILCs is not valid for Microlite lighting controllers. For Microlite panels, use the information for Vendor Devices instead (VND).
Interfaces to the N30

There are several user interfaces to the N30 available. M-Series Workstations are used for online browsing and editing of facility conditions with full graphical displays, VT100 Terminals or Terminal Emulators on PCs can be used to add, edit, and browse objects in text mode. Project Builder software is used for offline creation, management, and editing of N30 databases. The Local Display Terminal (LDT) installed in the N30 is used for display of a selected set of data from the facility, including alarms, and allows local onsite adjustments to operating conditions.

M-Series Workstation

Johnson Controls M-Series Workstation product portfolio represents a special packaging of software components.

The M3 Workstation software application suite includes monitoring, commissioning, and analysis features. It works in combination with N30 Series and existing Companion™/Facilitator Supervisory Controllers to provide a complete facility management solution.
The M5 Workstation provides extensions and enhancements to the Metasys Operator Workstation (OWS) to enable existing Metasys N1 systems to be expanded with N30 controllers.

**M-Tool**

M-Tool contains the System Tools and the Configuration Tools. The Project Builder component of System Tools includes the ability to:

- upgrade existing N30s to the latest firmware
- import Advanced Installation Management (AIM) Tools point lists and room schedule information
- configure the complete N30 database
- upload and download Application Specific Controllers (ASCs) and DXs from a file created by Configuration Tools

M-Tool includes the N30 Upgrade Utility, which allows you to upgrade databases from the data format used at one release to the data format used at the next release.

![Figure 2-2: Networked N30s Example](image)

**VT100 Terminal**

A video terminal developed by DEC and still a standard interface. A VT100 Terminal can be connected to a serial port on an N30 either directly or via modem.
VT100 Terminal Emulator
A program that allows a computer to function like a VT100 Terminal. The computer appears as a terminal to the N30 and accepts the same escape sequences for functions such as cursor positioning and clearing the screen.

Local Display Terminal (LDT)
A display device optionally installed in the N30 controller. The LDT provides alarm notification and navigation and access to data in the controller. It allows the display and modification of operating conditions, such as temperature, heating and cooling setpoints, and fan override.

For more information on the LDT, refer to the *N30 Supervisory Controller Installation Technical Bulletin (LIT-6891100).*

Printer
Connects to an N30 via a serial port or modem. The N30 sends data, such as alarm messages, summaries, or scheduled reports to a printer file in one of three ways: automatically, by operator command, or by scheduled command.

N2 Bus
The communication network that allows the application specific controllers to communicate with the N30.

Ethernet Bus
The Local Area Network (LAN) protocol used to allow multiple N30 Supervisory Controllers to communicate peer-to-peer using BACnet® messaging. It is a widely used LAN standard.

BACnet
The Building Automation Control Network (BACnet), Standard 35-1995, designed by the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) as a data communications protocol to promote connectivity between multiple vendors of control equipment.

10BaseT, Twisted Pair Cable
The Cable used to connect N30s in an Ethernet network. Specified by the IEEE 10BaseT standard, Unshielded Twisted Pair (UTP) and Shielded Twisted Pair (STP) are common and economical media to install in the network.