

## Section 1.3

# Preparation

Good preparation is the best way to ensure a successful installation. The work and effort put into preparation will pay dividends at the end of the project. This section describes the steps to take to prepare for a smooth and efficient installation process.

As with any innovation, the Network System will require learning a new approach. Yet in a short amount time, you will recognize the Network System is easier to install and wire than conventional control systems. The connections are the same in every installation, so understanding gained on one job transfers directly to the next.

### Hardware

An important step in preparing for an installation is learning about the hardware components.

**Section 1.2** describes each hardware component of the Network System. This section explains the typical locations for installing or mounting hardware.

Before starting a job, be sure you understand:

- What each device does
- Where each device will mount
- How to wire each device

You should also read all installation documents and identify the fasteners or mounting hardware necessary for the job.

### Wire Types

Determine the types and approximate lengths of wire for the installation.

The Network System primarily uses Cat5 Ethernet wire and 18/2 thermostat wire.

#### Use Cat5 for:

- Control-to-control communication
- Connections to peripheral devices such as boiler, pump and valve relays

#### Use 18/2 thermostat wire for:

- Connecting the thermostats to the Digital Zone Control Module (DZCM) and sensor wires (10k) if adding additional points of information or extending sensor wires

### Types of Ethernet Wire

Several types of Ethernet wire are available, including Cat5, Cat5e and Cat6. The naming convention might suggest that Cat5e is better than Cat5 and that Cat6 is the best. However, the primary difference among these wires is the maximum run length; see **Table 1.3-1**. Using Cat5e or Cat6 when Cat5 will work adds cost without any benefit.

**Note:** The Network System uses Ethernet wire for the connection plug, not the communication speed. Components will communicate at much slower rates than Ethernet wire will support.

Wire Type	Network Speeds	Maximum Distance
Cat5	350 mHz	250' (76.2m)
Cat5e	350 mHz	600' (182.9m)
Cat6	350 mHz	1,500' (457.2m)

**Table 1.3-1: Ethernet Wire Specifications**

Quality of wire varies regardless of the specification it meets. Two manufacturers may offer wire that meets the Cat5 specification, but with a noticeable quality difference. While the quality difference will not degrade Network System performance, it may cause assembly problems. For example, one manufacturer may use a thinner wire that breaks easier; another manufacturer may sell wire a shade lighter than its pair (such as pairing pale orange to orange), which can make it difficult to see the wire color-code combinations.

A feature of most Cat6 wire can also make assembly more difficult. Most Cat6 wire is made with a plastic spine in the middle of the wire core to separate the pairs. The spine requires additional steps in making the connectors without adding value to the Network System.

### Ethernet Connectors

Select the type of connector for the project and the approximate number required.

While there are several types of connectors for use with Ethernet wire, they are interchangeable. The two main types of connectors are Cat5 RJ45 connectors and Cat6 RJ45 connectors. The difference between

the two is the wires come through the end of the Cat6 RJ45 connectors. This difference makes wiring easier in two ways:

- It is easier to ensure the wires extend all the way into the connector when crimping them.
- It is easier to read the color coding as wire is not blocked as it is with the Cat5 RJ45 connector.

However, the Cat6 RJ45 connectors require a Cat6-specific crimper for trimming the wires.

### General Tools

**Table 1.3-2** lists the tools needed to install the Network System.

### Computer-related Tools

The Network System installation also requires two computer-related items: The Uponor Configuration Tool (UCT) software (A9090000) and a Universal Serial Bus (USB) flash drive.

The UCT sets up the controls and commands components on and off. Multiple installations can use the UCT software.

A USB flash drive (also called a thumb drive) makes a backup of the configuration files for Network System components. You can reload the back-up files in minutes if the end user accidentally changes a setting or if a piece of hardware fails or is damaged.

Tool	Function	Uponor Part Number
Standard Wire Strippers	Cuts Cat5 and thermostat wire to bare the wire for connections <b>Note:</b> When stripping wires, bare ¼" to ⅜" of the copper or stranded wire. Never expose too much wire as it may short against another wire, potentially damaging hardware or preventing operation.	Not applicable
Cat5 Cable Stripper	Removes the outer jacket of the four pairs of wire <b>Note:</b> Take care not to nick the small pairs of wires. They will break when separated to make a crimp connection. A Cat5 cable stripper is specifically designed to cut through the outer sheath without nicking the wires inside.	A9030200
Modular Plug Crimping Tool (Cat5 Cable Crimper)	Crimps the RJ45 connector onto the four pairs of wires after separating the colors and aligning them for placement in the connector	A9030300
Cable Tester	Ensures the cable is good To use: • Plug each connector of an assembled cable into the tester. • Press the Test button. If all indicators illuminate green, the cable is good.	A9030100
Small Blade Screwdriver	Used for screw-style terminal connections	Not applicable
Wire Tags	Labels each end of a wire to make future troubleshooting easier	Not applicable
Marker	Labels wires	Not applicable

**Table 1.3-2 Network System Tools**

## Record Keeping

Keep good records; this is an essential part of every job. When installing the Network System, record the ports and terminals on each module. Use the forms in **Appendix A.6** to record connections for each component in a particular installation. Leave one copy with the owner or property manager, and keep one copy in a job file. These records will save time when troubleshooting the system or verifying connections.

## New Terminology

With a new control platform or technology, there are new words to learn. Uponor training classes, support personnel and manuals use the following terms and definitions with the Network System.

- **Commission:** Commissioning is following the right steps to make sure a device connects correctly to the Network System. For example, you can use the UCT to tell a boiler to run. If the boiler is turned on, but does not start, you must troubleshoot the problem. If the boiler runs, it is “commissioned.”
- **Command:** The UCT software allows the user to turn devices on and off and to override sensor readings to test the Network System. When a device or sensor is “commanded,” a user has intervened so the Network System can no longer automatically change its state.
- **Configuration:** This term means defining the system setup. Defining which devices run when a thermostat calls for heat and telling the system there are four boilers to rotate and stage are examples of “configuring” a system.
- **Programming:** This term refers to the underlying software code that tells the Network System what to do. The Network System comes with standard features pre-programmed. It also allows for customization through “programming.” As you become comfortable with the Network System, you can use programming to simplify system controls. Uponor offers a training class for users who wish to learn about Network System programming. For information about Network System classes, call 800.321.4739 or visit [www.uponorpro.com](http://www.uponorpro.com).

