

## Using LONSTATION™ with Third Party Devices

LITERATURE TYPE



# LONSTATION™



**System Integrator's Guide:  
Using LONSTATION™ with  
Third Party Devices**

**By Honeywell**

**August 2001**

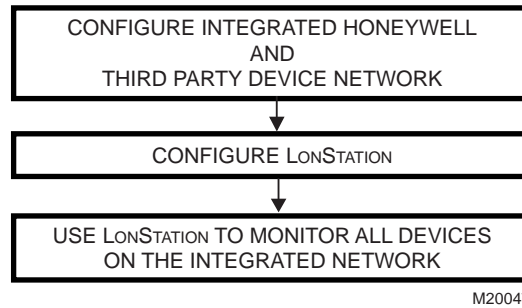
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## WHO SHOULD READ THE SYSTEM INTEGRATOR'S GUIDE?

The system integrator's guide is designed for use by anyone that could benefit by using LONSTATION™ to monitor both Honeywell LONWORKS® devices and third party LONWORKS® devices in the same network. Specifically, consulting engineers and building owners will find the Benefits of System Integration appendix section useful.

System integration is a three-step process as depicted by the diagram below:



This manual assumes familiarity with LonWorks® building automation systems including Honeywell XL15 and XL10 devices, the Honeywell LonSpec™ configuration and Honeywell LonStation™ monitoring tools, and the Echelon LonMaker configuration tool.

## ABBREVIATIONS USED IN THIS DOCUMENT

BAS	Building automation system that uses LonWorks digital communications to exchange information between the equipment and human interfaces in the system.
Binding	The process of logically connecting information in a source node to information in a destination node(s). When the source node information changes, the new value is automatically communicated to the destination node(s) over the LonWorks network.
Configuration Parameters	A device or object performs various predetermined and fixed functions selected by variables called <i>configuration parameters</i> . These parameters may select various functions from a repertoire of functions or may vary the function in some way (such as change the gain in a PID control loop).
Device, Node or Controller	An electronic module that controls mechanical equipment, displays device information to a human, or connects the communications network to another network. Nodes communicate with one another over the LonWorks network.
LNS	LonWorks Network Services - A server used by network tools to manage, monitor, and control the nodes on LonWorks networks.
LonMaker	An Echelon-made tool for configuring LonWorks devices. It is capable of configuring any LonWorks device that has compatible plug-in configuration software. It assigns network addresses and allows binding device variable devices together for data sharing. LonMaker has rudimentary monitoring capability. LonMaker is intended for use by system integrators and equipment installers. Monitoring capability can be extended by plug-ins or other third party tools. LonMaker uses LNS as its foundation.
LonSpec	A Honeywell-made tool for configuring Honeywell-made LonWorks devices. It is capable of configuring the Honeywell devices, assigning network addresses, and binding device variables together for data sharing. LonSpec has rudimentary monitoring capability. LonSpec is intended for use by equipment installers.
LonStation	A Honeywell-made tool for monitoring Honeywell and third party LonWorks devices. It is capable of reporting the current status and alarm conditions of devices on the network. LonStation is intended for use by the day-to-day on-site building operator or off-site representative.
PC	Personal computer work station running building management software.
Object	Each device contains one or more object. Each object has defined inputs, outputs, configuration parameters, and predetermined functionality.
Site or System	One building or campus. It consists of several devices connected together by one LonWorks network. Even if devices are miles apart, they can belong to one site if interconnected by one LonWorks network.
Third party device, node or controller	Device not manufactured by Honeywell but that meets LonMark standards. The device must at least operate on the LonWorks data network.
XIF file	An electronic Windows (DOS) file that specifies the network interface of a LonWorks device. Tools use this file to interpret information exchanged over the network. This file specifies only the LonMark standard interface data type. It does not specify user defined data types.

## TRADEMARKS

Echelon, LONMARK, LONWORKS, Digital Home, LonBuilder, LonManager, LonTalk, and Neuron are U.S. registered trademarks of Echelon Corporation.

LONSPEC, LONSTATION, and LNS, are trademarks of Echelon Corporation.

## REFERENCES

- “LonMark Application Layer Interoperability Guidelines” Revision 3.2 by LonMark Interoperability Association.
- “LonMark Layers 1-6 Interoperability Guidelines” Revision 3.0 by LonMark Interoperability Association.
- “LonMark External Interface File Reference Guide” Revision 4.0A by Echelon Corporation.
- “LonMark Resource File Developer’s Guide” by Echelon Corporation.
- “LonWorks Technology device Data” by Motorola.
- “SNVT Master List and Programmers Guide” by Echelon Corporation.
- “The LonWorks Network Services (LNS) Architecture Strategic Overview” white paper by Echelon Corporation.
- “The LonWorks Network Services (LNS) Architecture Technical Overview” white paper by Echelon Corporation.
- “LNS Programmers’ Guide for Windows” by Echelon Corporation.
- “Junction Box and Wiring Guideline for Twisted Pair LonWorks Networks” by Echelon Corporation.

See [www.echelon.com](http://www.echelon.com) for more information about LonWorks.

See [www.lonmark.com](http://www.lonmark.com) for more information about LonMark. **THIS WEB DOMAIN IS FOR SALE**

## INTENDED USES

A typical building automation system includes devices and monitoring tools. The devices control the environment (air temperature, humidity, lighting level, elevator travel, etc.) by interaction with building equipment. The monitoring tools report the present status (air temperature, humidity, lighting level, elevator floor, etc.) and operating condition of the building equipment.

Honeywell makes a product line of Heating Ventilating and Air Conditioning (HVAC) controls and compatible tools that use the LonWorks data network for communications. Other manufacturer's also make controls and tools for the LonWorks data communications network. Generally LonWorks devices operate with one another regardless who made the devices. This document shows how the Honeywell products can be used with third party devices.

There is a tremendous advantage to a building owner when systems made by different manufacturers can work together. See the "Benefits of System Integration" section for more details.

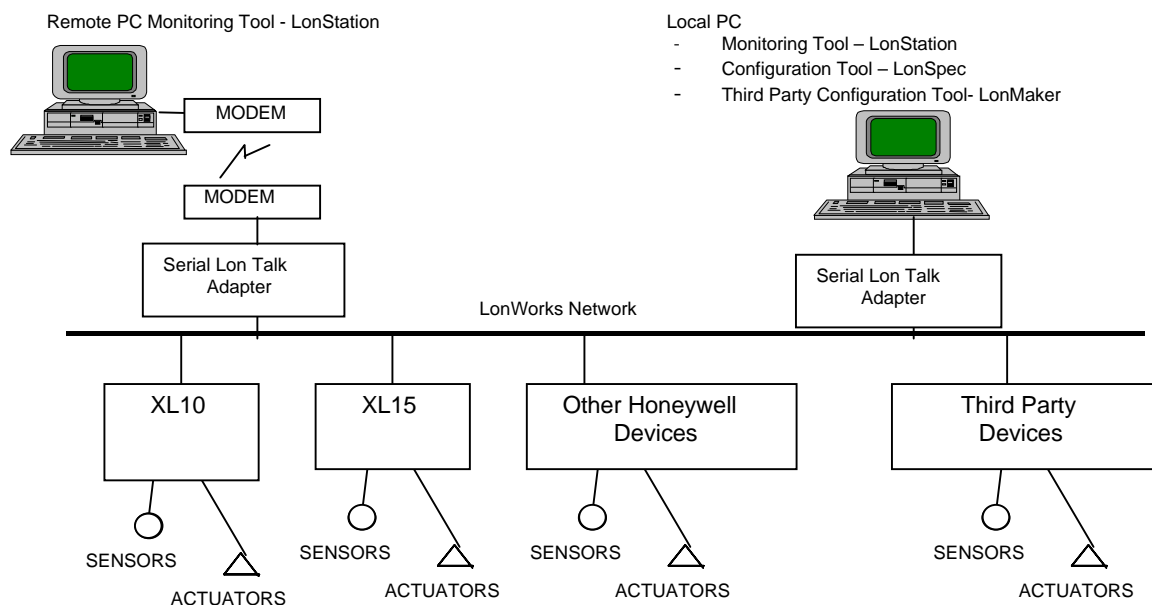
The scenario used throughout this document is:

- Honeywell devices are included in the network.
- The Honeywell configuration tool, LonSpec, is used to configure the Honeywell devices.
- The Honeywell configuration tool, LonSpec, is used to connect points (also called binding) in Honeywell devices logically together for data sharing purposes.
- Third party devices are included in the network
- LonMaker (or another third party configuration tool) is used to configure the third party devices). Optionally a LNS plug-in is available to configure the device.
- LonMaker (or another third party configuration tool) is used to connect points (also called binding) in third party devices logically together for data sharing purposes.
- This document focuses on using LonMaker as the third party configuration tool.
- XIF files are available for the third party devices.
- The Honeywell monitoring tool, LonStation, monitors the entire network.

Limitations imposed by this scenario:

- Only one third party configuration tool is used for third party devices. Additional third party configuration tools may be used but they are not addressed in scenarios described herein.
- Only one channel. No routers. A physical layer repeater is allowed.
- There is no data sharing between the Honeywell devices and the third party devices.
- The domain length must be one. LonSpec and LonStation require the domain length to be one.
- All devices operate on the same domain id.
- Two subnets maximum. Typically one for the LonSpec installed devices and one for the LonMaker installed devices.
- LonStation only monitors Standard Network Variable Types (SNVTs) in third party devices. LonStation does not monitor user defined data types (UNVTs) in third party devices.
- LonStation only monitors network variables in third party devices. LonStation does not monitor files in third party devices.
- Honeywell configured networks should not be recovered into a LNS environment using the LonMaker Network Recovery facility. The recovery process alters some of the bindings and may alter the device addresses causing a portion of the Honeywell devices to no longer function correctly.
- Do not merge the LonMaker network into another network using the LonMaker Merge facility. The LonMaker Merge facility alters all of the addresses of all the devices on the network. This can prevent some Honeywell devices from functioning properly.
- This document was written specifically for LonSpec 3.x, LonStation 3.x, and LonMaker 3.x. In principle this document applies to earlier or later versions of the software but the details may vary. LonStation does not have third party capability in earlier versions.

The figure below illustrates a typical system.



## WHAT IS NEEDED BEFORE INTEGRATION?

Before integration is attempted, the following items need to be available:

- LonSpec 3.1.0 or above (with Network Interface).
- Honeywell devices.
- LonMaker version 3.1.0 or above or other tool (with Network Interface).
- LNS plug-ins for third party devices (or alternative way of commissioning third party devices).
- Third party devices.
- LonMark certified XIF files for all third party devices.
- LonStation 3.1.0 or above (with network interface – either local or remote).
- Documentation for LonSpec, LonMaker, LonStation (desirable but optional).
- Installer documentation for all Honeywell and third party devices (desirable but optional).
- Domain ID of integrated network.

## STEP BY STEP INTEGRATION

When using LonStation as the monitor tool, there are two major steps to system integration:

1. Create the integrated network. An integrated network is one with both Honeywell devices installed using LonSpec, and third party devices installed using LonMaker. There are three possible combinations:
  - a. Create a new integrated network. System planning is highly beneficial.
  - b. Add third party devices to an existing Honeywell network using LonMaker
  - c. Add Honeywell devices to an existing third party network using LonSpec.

Because two configuration tools are used during the creation of the integrated network (and because each tool assigns network addresses independently), the installer must manage the network addresses. Specifically:

- (1) Both configuration tools must be programmed to use the same domain address for all devices.
  - (2) Each configuration tool must be programmed to use a different subnet address for each device that it configures. Alternatively, dummy devices can be created as place holders for devices being commissioned on another tool.
  - (3) LonStation requires that all devices use the same domain index for the active domain index. Since LonMaker uses domain index 0 for the active domain index, all devices must use domain index 0 for the active domain index. Sometimes the active domain is referred to as the non-zero length domain.
2. Configure LonStation for use with third party devices. The LonStation Administrator must register the XIF files for third party devices. In addition the Administrator may customize the device name and the monitor screen. See LonStation on-line help for additional details.

### IMPORTANT

- *It is anticipated that the installer already knows how to use LonSpec, LonMaker, and LonStation. Detailed instructions are available in the respective tool documentation.*
- *This document provides instructions on how to integrate third party devices into a Honeywell network for display by LonStation.*
- *It is also expected that the installer already knows how he plans to use the functionality of devices. This document does not help configure the devices for functionality within the system.*

## Creating a New Integrated Network

The general steps for creating a new integrated network are:

1. Determine addressing scheme to be used in the integrated network. The domain length must be one and the domain id for both LonMaker and LonSpec must be the same. The subnet addresses must not conflict between LonMaker and LonSpec.
2. Create a network with LonSpec using Honeywell Devices (Not Connected)
3. Create a network with LonMaker using third party devices. (OffNet)
4. Connect all the devices and tools to the network
5. Commission all Honeywell devices using LonSpec (Connected)
6. Commission all third party devices using LonMaker (OnNet)

NOTE: The steps are detailed below.

### Determine the Addressing Scheme to Be Used in the Integrated Network

The following network addresses must be determined:

- Domain id of the integrated network. The LonSpec domain is always one byte long. The LonSpec default id is 44 decimal or 2C Hexadecimal. Using the default LonSpec domain id is acceptable in this case.
- Subnet address of the third party devices. LonMaker generally assigns subnet 1 to as many devices that can fit into a subnet. A subnet can have 127 devices.
- Subnet address of the Honeywell devices. When a subnet is created in LonSpec, there is an opportunity to change the subnet. It is recommended that subnet 127 be used.



## Create a Network with LonSpec (Not Connected)

1. Create a new project. From the menu, select Project – New; then give the project a name.
2. Select the project.
3. From the menu, select Network – New. Enter the network name and optional telephone number.
4. Click on Advanced Features.

**New Network**

Network Name: EAMPLED

Telephone No:

Site ID: 1

Advanced Features

OK Cancel Help

5. On the Advanced Features dialog, set the Domain id to the desired integrated network domain. Set the domain index for non-zero length domain to "0 (LNS based systems)". Click OK twice.

**Advanced Features**

Domain ID: 44

Domain index for non-zero length domain: 0 (LNS based systems)

OK Cancel Help

6. Create a new subnet with the subnet of the Honeywell devices. From the menu, select Network – New subnet.
7. On Add Subnet dialog, give the subnet a name and enter the desired LonSpec (Honeywell) subnet.
8. Click OK.

**Add Subnet**

Subnet Name: SUBNET127

Subnet ID: 127

OK Cancel Help

9. Create devices on the network by dragging devices to the subnet.
10. Configure devices on the network.
11. Create any additional bindings using refer points.

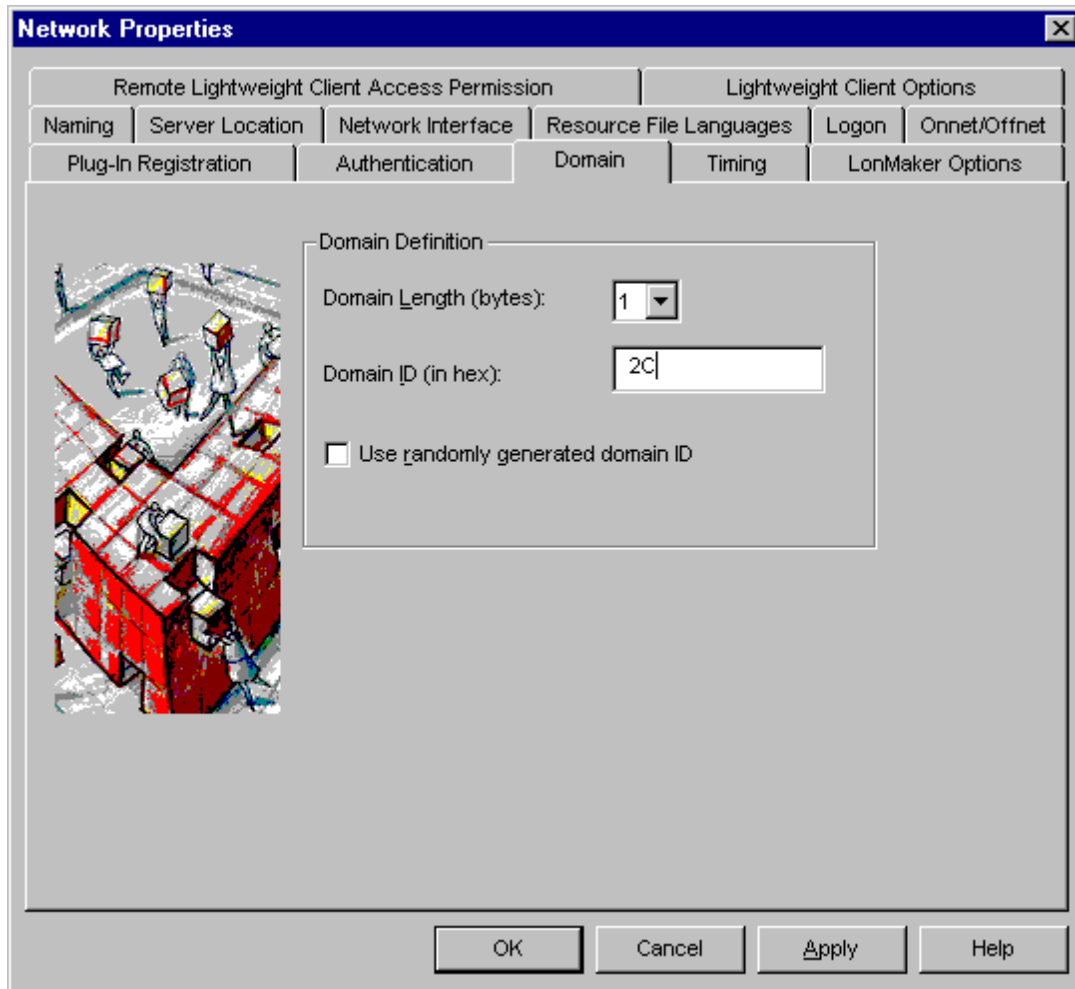
## Create a Network with LonMaker (OffNet – Not Attached to Network)

1. Install plug-ins and resource files for the third party devices.
2. Create a new network.

3. From the menu, select LonMaker and then Network Properties.
4. On the Network Properties dialog, select the Domain tab. Set the network domain id to the desired integrated network domain.

NOTE: The domain length must be one.

5. Click OK.



6. Create the third party devices on the network drawing (import XIF files as needed).
7. Create function blocks on the network drawing.
8. Create connections (bindings) between function block network variables on the network drawing.
9. Configure the function blocks and devices using the plug-ins provided for the third party devices.

### Connect All the Devices and Tools to the Network

1. Use appropriate network wiring practices.
2. Equipment controlled by the devices should be disabled until after device commissioning.
3. Power is applied to the devices.

### Commission all Honeywell Devices Using LonSpec (Connected)

1. Assign the neuron id of Honeywell devices to devices on LonSpec.
2. Commission all Honeywell devices.

### Commission All Third Party Devices Using LonMaker (Attached to Network - OnNet)

1. Commissioning prompts the user for the neuron id of third party devices.
2. LonMaker automatically downloads the configuration parameters and network image to the third party devices.

## Adding Third Party Devices to an Existing Honeywell Network

The general steps for creating a integrated network from a an existing Honeywell network are:

1. Determine addressing scheme to be used in the integrated network. The domain length must be one and the domain id for both LonMaker and LonSpec must be the same. The subnet addresses must not conflict between LonMaker and LonSpec. Use LonSpec to check the domain id and subnet address on the network.
2. Create a network with LonMaker using third party devices. Create dummy device place holders for addresses that have been (or will be) commissioned by LonSpec. (OffNet).
3. Using LonSpec, set the active domain index to zero (Not Connected).
4. Connect all the devices and tools to the network.
5. Re-Commission all Honeywell devices using LonSpec (Connected).
6. Commission all third party devices using LonMaker (OnNet).

NOTE: The steps are detailed below.

### Determine the Addressing Scheme to Be Used in the Integrated Network

The following network addresses must be determined:

1. Domain id of the integrated network.

NOTE: The LonSpec domain is always one byte long. Using the LonSpec domain id is acceptable in this case.

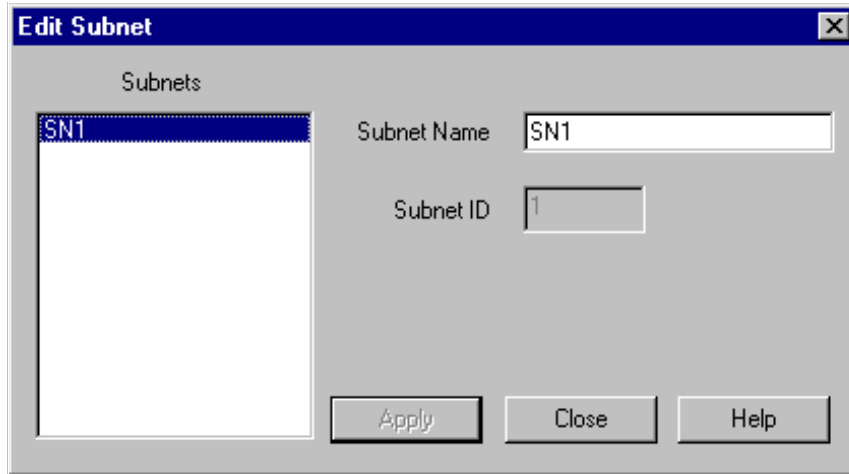
2. Using LonSpec, read the LonSpec domain id by first selecting the network.
3. From the menu, select Network – Edit to display the Network dialog shown below:

4. Click Advanced Features to display Advanced Features dialog. The domain id is displayed in decimal. LonMaker displays the domain id in hexadecimal.

NOTE: You will have to convert the LonSpec domain id to hexadecimal for use with LonMaker.

5. Subnet address of the Honeywell devices. Using LonSpec, read the LonSpec subnet by first selecting the subnet.
6. From the menu, select Network – Edit Subnet to display the Edit Subnet dialog shown below.

NOTE: The Subnet ID is shown but cannot be changed.



7. Because the default subnet id is one, the LonSpec subnet id is likely one:
  - a. If the LonSpec subnet id is one, list all of the devices using LonSpec by selecting the network or subnet.
  - b. If LonSpec does not use subnet id equal to one, then skip step 8.

Device	Type	Status	Subnet/Node	Neuron ID
VAV ZONE1	XL10 VAV II	Commissioned	1/1	000411203400
VAV UNUSED	XL10 VAV II	Not Assigned	1/2	000000000000
XL15C AHU1	XL15C Plant Control	Not Commissioned	1/3	010037AB1100
RI01	XL10 RIO	Not Commissioned	1/4	01005443B900
VAV ZONE2	XL10 VAV II	Commissioned	1/5	01001F2F7E00
VAV ZONE3	XL10 VAV II	Commissioned	1/6	000398983500

**NOTE:** Because LonMaker also assigns subnet id equal to one to the first devices, there will be a conflict when LonMaker commissions devices on the network. Therefore it will be necessary to create dummy devices as placeholders in the LonMaker network. Additional placeholders should be created in LonMaker to account for possible future expansion of the LonSpec commissioned devices. For example: If the highest node id assigned by LonSpec was 45, then 70 dummy devices need to be created in LonMaker allowing 25 devices for future expansion of the LonSpec network.

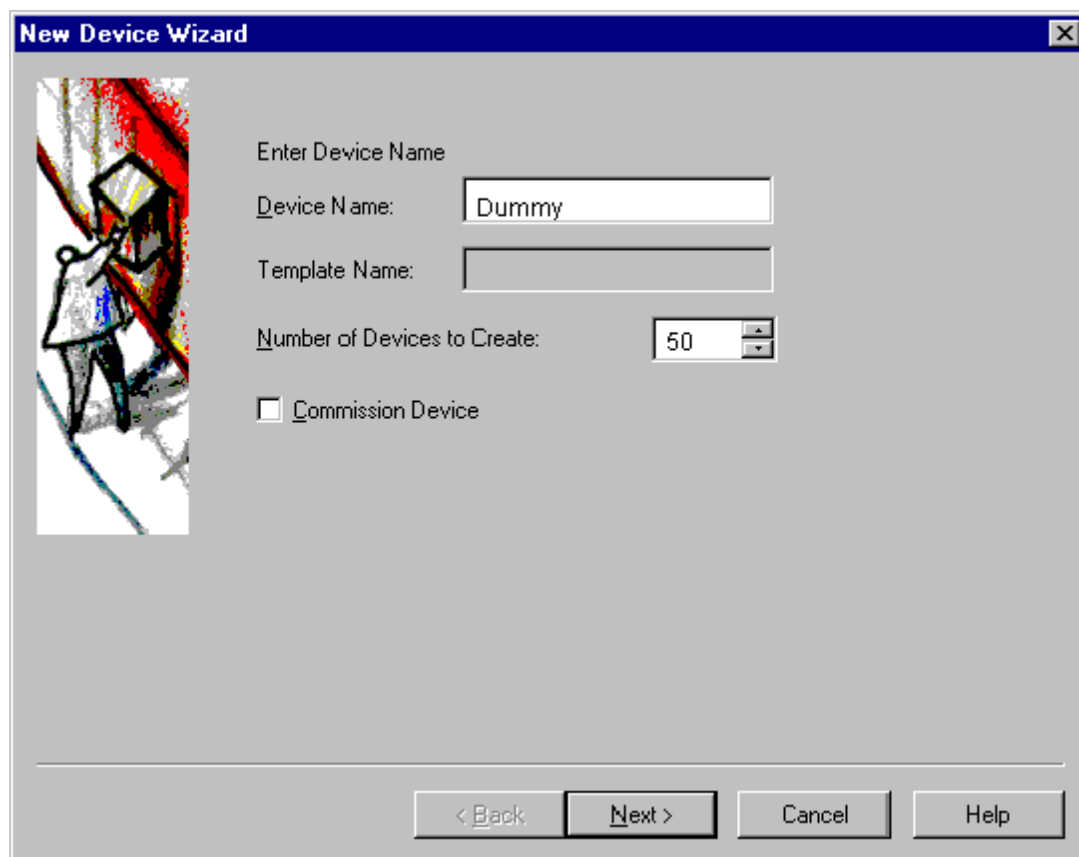
8. To create dummy devices:
  - a. From the menu, select Reports – Device Status. The Offline Device Status reports all the devices in the network and their subnet – node addresses.
  - b. Sort through the list to determine the highest node number assigned by LonSpec.

## Create a Network with LonMaker (OffNet – Not Attached to Network)

1. Install plug-ins and resource files for the third party devices.
2. Create a new network.
3. Set the network domain id to the desired integrated network domain. From the menu select LonMaker, Network Properties and then the Domain tab.
4. Create dummy devices as place holders for devices that have been installed by LonSpec, allowing for additional expansion of the LonSpec network. Dummy devices are created in the same way as other devices:
  - a. Drag the device onto the drawing causing the New Device Wizard to Appear.
  - b. Give the device a name.
  - c. Select the number of devices to create.

NOTE: There is a limit of 64 devices at a time. Do not commission the devices. Dummy devices are never commissioned.

- d. Click Next.



**New Device Wizard**

Enter Device Name

Device Name:

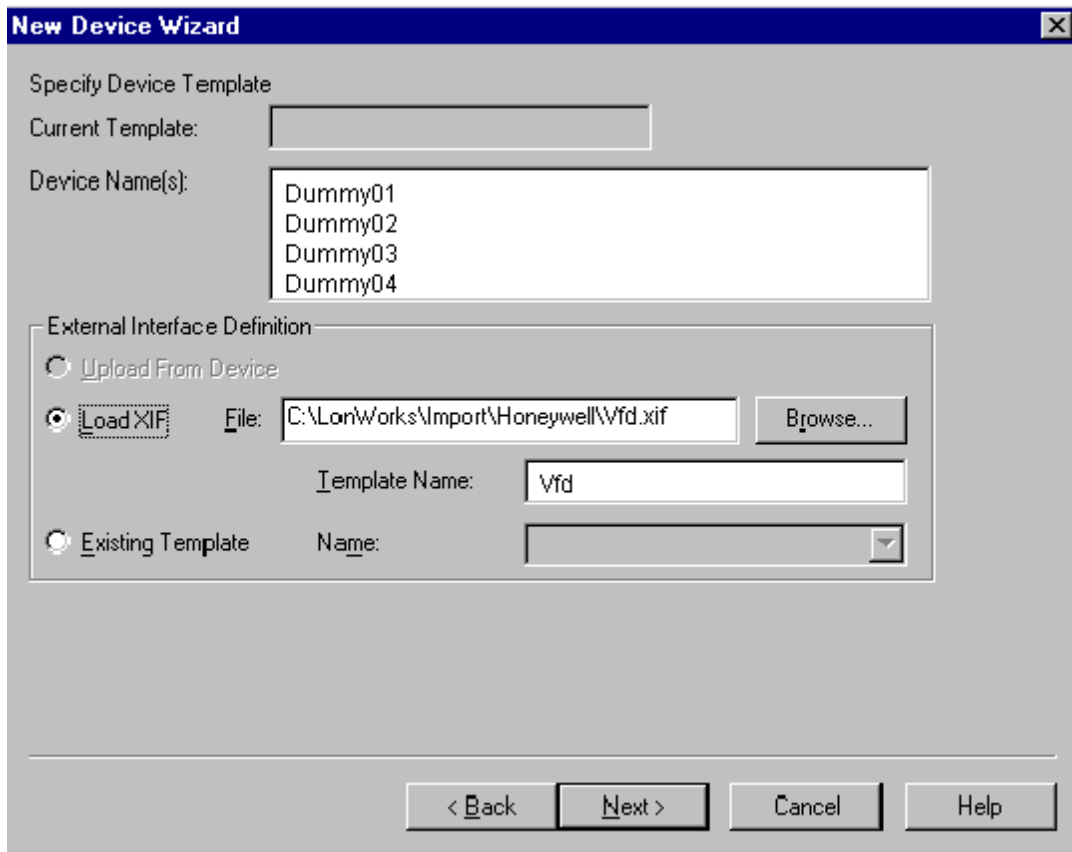
Template Name:

Number of Devices to Create:

☐ Commission Device

< Back   Next >   Cancel   Help

5. Select any XIF file that you have available.
6. Click Next and Finish.

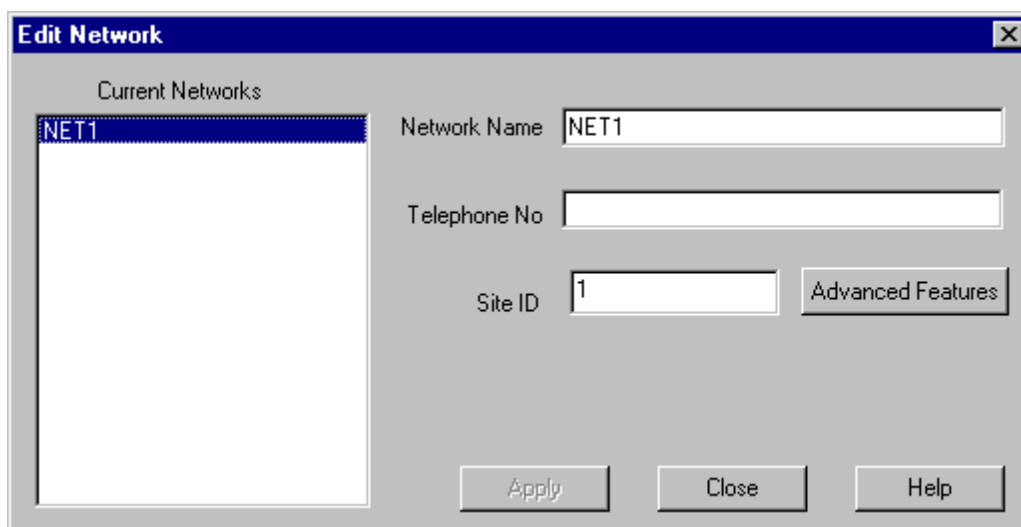


7. Create the third party devices on the network drawing (import XIF files as needed).
8. Create function blocks on the network drawing.
9. Create connections (bindings) between function block network variables on the network drawing.
10. Configure the function blocks and devices using the plug-ins provided for the third party devices.

### Using LonSpec, Set the Active Domain Index to Zero (Not Connected)

LonStation requires that all devices use the same domain index for the active domain index. Since LonMaker uses domain index 0 for the active domain index, all devices must use domain index 0 for the active domain index. Sometimes the active domain is referred to as the non-zero length domain:

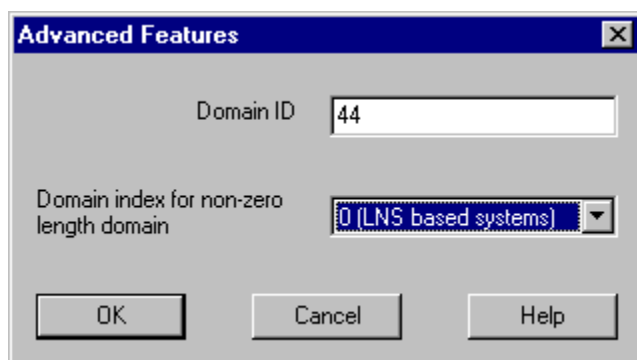
1. From LonSpec, select first the project and make a backup. The back up can be used in case something goes wrong with the following step.
2. Select the network.
3. From the menu, select Network – Edit. Enter the network name and optional telephone number.
4. Click on Advanced Features.



5. On the Advanced Features dialog set the domain index for non-zero length domain to "0 (LNS based systems)".

NOTE: When the domain index for non-zero length domain is changed, you will have to re-commission all the Honeywell controllers with LonSpec in a later step. If the Honeywell network is already using 0 for the Domain index for non-zero length domain you will not have to re-commission the Honeywell devices.

6. Click OK twice.



### Connect All the Devices and Tools to the Network

1. Use appropriate network wiring practices.
2. Equipment controlled by the devices should be disabled until after device commissioning.
3. Power is applied to the devices.

### Re-Commission all Honeywell Devices Using LonSpec (Connected)

If the non-zero length domain index was changed in a previous step, Commission all Honeywell devices.

### Commission All Third Party Devices Using LonMaker (OnNet)

1. Commissioning prompts the user for the neuron id of third party devices. Do not commission dummy devices.
2. LonMaker automatically downloads the configuration parameters and network image to the third party devices.

## Adding Honeywell devices to an existing third party network

The general steps for creating a integrated network from a an existing third party network are:

1. Determine the addressing scheme to be used in the integrated network:
  - a. The domain length must be one.
  - b. The domain id for both LonMaker and LonSpec must be the same.
  - c. The subnet addresses must not conflict between LonMaker and LonSpec.
  - d. Use LonMaker to read the existing domain id and subnet addresses.
2. Create a network with LonSpec using Honeywell Devices (Not Connected).
3. Connect the new devices and tools to the network.
4. Commission all Honeywell devices using LonSpec (Connected).

NOTE: The steps are detailed below.

### DETERMINE THE ADDRESSING SCHEME TO BE USED IN THE INTEGRATED NETWORK

The following network addresses must be determined:

1. Domain id of the integrated network. Check LonMaker for the domain id of the network. From the LonMaker menu, select LonMaker, Network Properties. There is a domain tab that shows the selected domain id.
  - If the domain length is not one, change it to one. Put LonMaker OnNet to update all the third party devices.
  - LonMaker Network Properties – Domain shows the domain id. Use this domain id for LonSpec. LonMaker shows the domain id in hexadecimal. LonSpec shows the domain id in decimal. You must convert hexadecimal numbers to decimal numbers.
2. Subnet address of third party devices. LonMaker generally assigns subnet 1 to as many devices that can fit into a subnet.
  - a. A subnet can have 127 devices. If there are more than 127 devices, LonMaker may assign devices to subnet 2, 3, etc.
  - b. Device addresses can be viewed one at a time using LonMaker:
    - (1) Select a device on the drawing.
    - (2) Right click to show the drop down menu.
    - (3) From the drop down menu select Properties to show the Device Properties.
    - (4) Click the Identifiers tab to view the subnet/Node Id of the device.

The screenshot shows the 'Device Properties' dialog box with the 'Identifiers' tab selected. The dialog has three main tabs at the top: 'Advanced Properties', 'Self-documentation', and 'Functional Blocks'. Under 'Advanced Properties', there are three sub-tabs: 'Attributes', 'Identifiers' (which is active), and 'Basic Properties'. The 'Identifiers' tab contains the following fields:

- Device Name:** A text box containing 'Device 79'.
- Handle:** A text box containing '80'.
- Subnet/Node ID:** A text box containing '1/79'.
- Subnet Name:** A text box containing 'Subnet\_1\_1'.
- Neuron ID:** A section containing two text boxes:
  - Current:** A text box containing '<Unknown>'.
  - Pending:** An empty text box.

At the bottom of the dialog are four buttons: 'OK', 'Cancel', 'Apply', and 'Help'.



3. Subnet address of Honeywell devices. When a subnet is created in LonSpec, there is an opportunity to change the subnet. It is recommended that the subnet 127 be used.

#### CREATE A NETWORK WITH LONSPEC (NOT CONNECTED)

1. Create a new project. From the menu, select Project – New; then give the project a name.
2. Select the project.
3. From the menu, select Network – New. Enter the network name and optional telephone number.
4. Click on Advanced Features.

**New Network**

Network Name: EAMPLED

Telephone No:

Site ID: 1

Advanced Features

OK Cancel Help

5. From the menu, select Network - New. Enter the network name and optional telephone number.
6. Click on Advanced Features.
7. On the Advanced Features dialog, set the Domain id to the desired integrated network domain.
8. Set the domain index for non-zero length domain to "0 (LNS based systems)".
9. Click OK twice.

**Advanced Features**

Domain ID: 44

Domain index for non-zero length domain: 0 (LNS based systems)

OK Cancel Help

10. Create a new subnet with the subnet of the Honeywell devices:
  - a. From the menu, select Network – New subnet.
  - b. On Add Subnet dialog, give the subnet a name and enter the desired LonSpec (Honeywell) subnet.
  - c. Click OK.

**Add Subnet**

Subnet Name: SUBNET127

Subnet ID: 127

OK Cancel Help

11. Create devices on the network by dragging devices to the subnet.

12. Configure devices on the network.
13. Create any additional bindings using refer points.

#### CONNECT ALL THE DEVICES AND TOOLS TO THE NETWORK

1. Use appropriate network wiring practices.
2. Equipment controlled by the devices should be disabled until after device commissioning.
3. Power is applied to the devices.

#### COMMISSION ALL HONEYWELL DEVICES USING LONSPEC (CONNECTED)

1. Assign the neuron id of Honeywell devices to devices on LonSpec.
2. Commission all Honeywell devices.

## LonStation Set Up

LonStation can monitor third party devices after the XIF file for the device has been registered. In addition the display of device variables may be customized. LonStation is able to display Standard Network Variable Types (SNVTs) defined by LonMark. LonStation is not able to display User defined network variable types (UNVTs) defined by other manufacturers. LonStation only displays network variables and cannot display files.

### Registering XIF File into LonStation

The user must have the LonMark certified XIF file for the device. The XIF file contains information of how to identify particular device types and how to access and display device variables. The first step is to register the XIF file with LonStation:

1. Copy the XIF file to a drive on your computer.
2. Log onto LonStation as the Administrator. Only the Administrator can register XIF files or customize the third party monitor screen.
3. From the main menu select Configure, then Third Party Devices.
4. On the "Register Third Party LON Device" dialog box, Click the Register button.
5. Using the file select dialog, Select the desired XIF file.
6. Change or enter the Type name.
7. Change or enter the manufacturer's name.
8. Click Save to save the new XIF registration.
9. Click Close to close the dialog box.

**Register Third Party LON Device**

Registered Third Party LON Devices

- Hydroniccontroller
- WattNode PowerEnergy Sensor,

Register Unregister

Device Identification

Program ID : 8:0000C:5014:0304:0B

Type Name : Hydroniccontroller

Manufacturer : Third Party

Available SNVT Fields

SNo	Monitor	NV Name	Alias Name	Metric Unit	British Unit	Native Unit	Access Level	Low Limit	High Limit
1	<input checked="" type="checkbox"/>	nviRequest	usermodifiedobject				4	0	65535
2	<input checked="" type="checkbox"/>	nviRequest	nviRequest_Object_requ				4	0	255
3	<input checked="" type="checkbox"/>	nvoStatus	nvoStatus_object_id				1	0	65535
4	<input checked="" type="checkbox"/>	nvoStatus	nvoStatus_invalid_id				1	0	1
5	<input checked="" type="checkbox"/>	nvoStatus	nvoStatus_invalid_reque				1	0	1
6	<input checked="" type="checkbox"/>	nvoStatus	nvoStatus_disabled				1	0	1
7	<input checked="" type="checkbox"/>	nvoStatus	nvoStatus_out_of_limits				1	0	1
8	<input checked="" type="checkbox"/>	nvoStatus	nvoStatus_open_circuit				1	0	1
9	<input checked="" type="checkbox"/>	nvoStatus	nvoStatus_out_of_servic				1	0	1
10	<input checked="" type="checkbox"/>	nvoStatus	nvoStatus_mechanical_f				1	0	1
11	<input checked="" type="checkbox"/>	nvoStatus	nvoStatus_feedback_fai				1	0	1
12	<input checked="" type="checkbox"/>	nvoStatus	nvoStatus_over_range				1	0	1
13	<input checked="" type="checkbox"/>	nvoStatus	nvoStatus_under_range				1	0	1

Save Print Close Help

## Customizing the Third Party Monitor Screen

The *Register Third Party LON Device* dialog contains a tabular list of parameters which may be changed to customize the monitor screen for each third party device type. Each line on tabular list is for a particular device variable. The columns specify how the variable displays on the monitor screen. The Administrator may change any the parameters.

NOTE: Some parameters are fixed by the XIF file and cannot be changed.

Parameter	Changeable by Administrator	Meaning
S No:	No	Sequential number for each variable within a network variable.
Monitor	Yes	When checked, the variable is displayed on the monitor screen.
NV Name	No	Network variable name given by the XIF file.
Field Alias Name	Yes	Name of the variable displayed on the monitor screen.
Metric Unit	Analog Values – Yes Enumerated Values - No	The engineering unit that is displayed with this variable when LonStation is displaying metric units.
British Unit	Analog Values – Yes Enumerated Values - No	The engineering unit that is displayed with this variable when LonStation is displaying English units.
Native Unit	No	Native unit of variable given by the SNVT number in the XIF file.
Access Level	Yes	The LonStation Access level for which this variable will be displayed: 1 = Monitor points only. 2 = Monitor points, change set points and bypass the schedule. 3 = Allows privileges of access level 2 plus can change schedules. 4 = Allow full monitor and configuration capability.
Low Limit	Yes	On the monitor screen, the lowest value that may be entered by a user to change this variable. Does not apply to variables that may not be changed.
High Limit	Yes	On the monitor screen, the highest value that may be entered by a user to change this variable. Does not apply to variables that may not be changed.

How to change display parameters:

1. From the main menu select Configure, then Third Party Devices.
2. On the dialog box in the "Third Party LON Devices" window, select the device type you wish to customize.
3. Change any of the parameters as you desire.
4. Click on Save to save your changes.

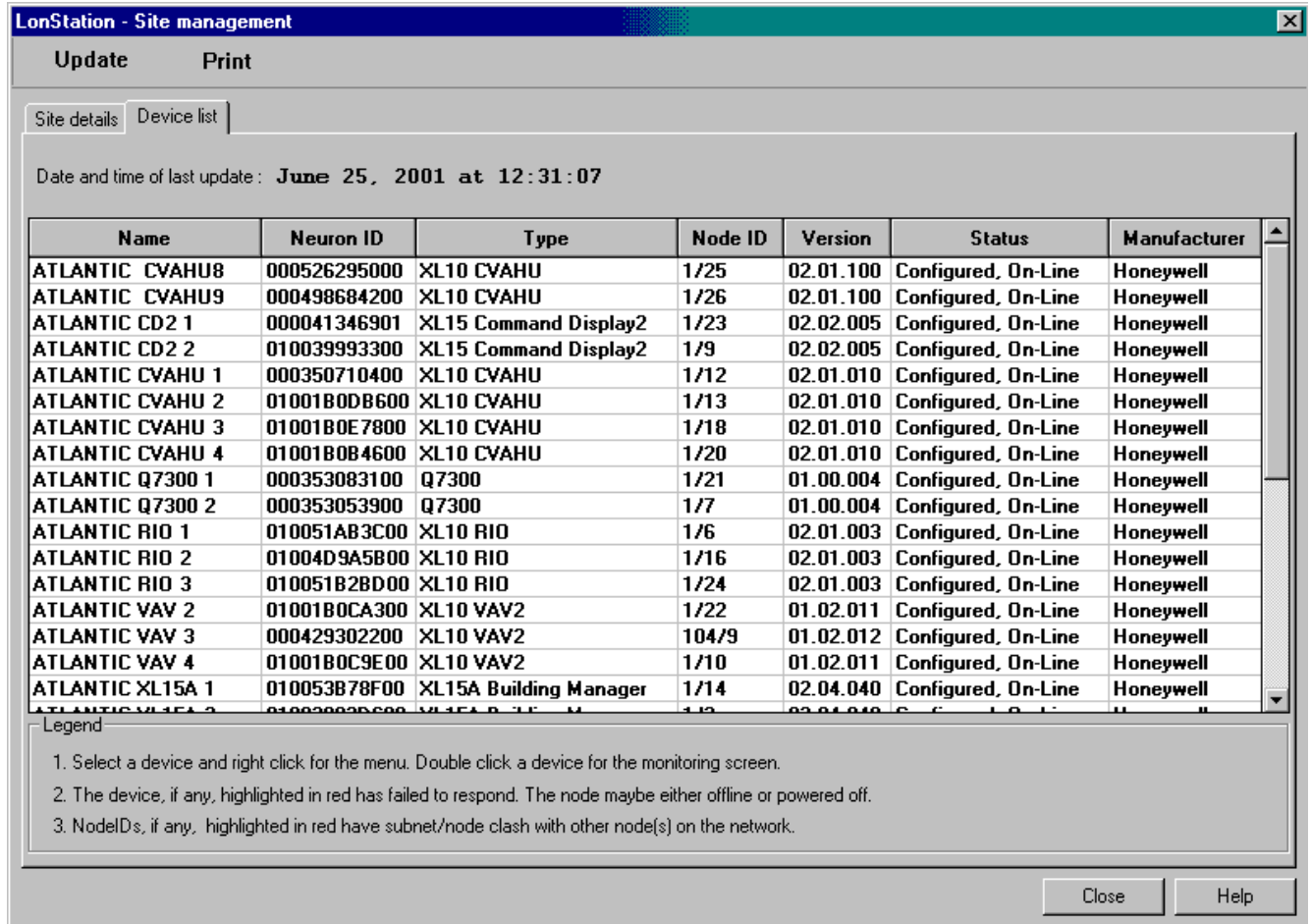
NOTE: A device type may be unregistered by clicking the *UnRegister* button.

## Naming the Third Party Devices

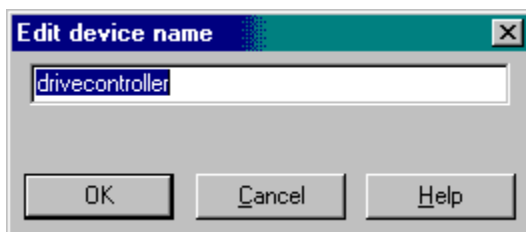
When LonStation is connected to the network, a list of devices can be displayed:

1. In the Services List, Select Site.
2. In the Site details navigation tree, select the site.
3. Press Connect, to connect to the site.
4. Click on the Device List Tab to display the Device List.

NOTE: If this is the first time displaying the third party device, you may have to click Update to command LonStation to search for new nodes.



5. To change the name of a device:
  - a. Select the device in the device list.
  - b. Right click brings up a drop down menu.
  - c. Select Edit Device to show the Edit Device Name Dialog.
  - d. Change the device name as desired.
  - e. Click OK.



NOTE: It will be helpful to have the neuron ids of third party devices so that the proper name can be given to each device. Neuron Ids are available in LonMaker or may be listed on the device label or tag.

## Monitoring Third Party Devices

Third party devices have a different monitoring screen than Honeywell devices. To monitor devices:

1. Select the device in the device list.
2. Right click the device to display the drop down menu.
3. Select Monitor. (The monitor screen is shown below.)

Monitoring WattNode			
SNo	Point Name	Value	Units
49	nciStsMaxSendT_elapsed_day	0.000000	
50	nciStsMaxSendT_elapsed_hour	0.00	hr
51	nciStsMaxSendT_elapsed_minute	0.00	hr
52	nciStsMaxSendT_elapsed_second	0.00	hr
53	nciStsMaxSendT_elapsed_milliseco	0.00	hr
54	nvoElecWH_f_elec_whr_f	6	BTU
55	nvoElecKWH KiloWattHr	0	BTU
56	nvoEngyClrT_time_stamp_year	Invalid	
57	nvoEngyClrT_time_stamp_month	0.000000	
58	nvoEngyClrT_time_stamp_day	0.000000	
59	nvoEngyClrT_time_stamp_hour	0.00	hr
60	nvoEngyClrT_time_stamp_minute	0.00	hr
61	nvoEngyClrT time_stamp_second	0.00	hr
62	nciGain_muldiv	10882.000000	
63	nciGain_divisor	0.000000	
64	nciCTAmps_Amp	5000.0	mA
65	nciWHMaxSendT_elapsed_day	0.000000	
66	nciWHMaxSendT_elapsed_hour	0.00	hr
67	nciWHMaxSendT_elapsed_minute	0.00	hr
68	nciWHMaxSendT_elapsed_second	0.00	hr

Apply Refresh Save To File Print Close Help

NOTE: In addition Custom graphics can be made for third party devices just like the Honeywell devices. See the LonStation documentation for instructions on how to create custom graphics for Honeywell and third party devices.

## APPENDIX

### Benefits of System Integration

The benefits of integrating equipment into a building automation system generally are:

- Reduced energy cost.
- Improved comfort, and / or safety for building occupants.
- Accommodate building use by enabling unique functions.
- Reduced equipment maintenance cost.
- Information sharing to reduce installed cost.

The benefits are enabled because the building equipment can “communicate” with their counterparts, can “report” certain conditions automatically to a remote location, and can be “reprogrammed”. For example:

- Energy is saved by reducing comfort when the building or a space in the building is not occupied. The space temperature can be allowed to float higher or lower when the building is not occupied.
- Automatic off-site monitoring of building equipment is an economic way of providing equipment maintenance only when needed. A single off-site monitoring station can monitor hundreds of buildings with little or no human intervention.
- By keeping track of equipment run time, maintenance can be “requested” by the equipment when it is time for maintenance.
- By viewing the current operating conditions of building equipment over a remote communications connection (telephone line), a technician can often diagnose a problem from his office. The serviceperson can be sure to bring the required parts on his truck when visiting the site.
- Many temporary “repairs” may be made over a remote communications connection to keep the building running at reduced functionality or efficiency, until a serviceperson can visit the site.
- Periodically, the building equipment operating conditions can be entered into a “trend log”. The log can later be viewed on a PC to show system performance. The log can verify that the system is (or is not) operating properly without a person having to be there to watch a system operate. Trend logs can be used for troubleshooting complaints made by building occupants.
- The control strategies can be tuned to decrease maintenance, and increase comfort. By viewing a carefully designed trend log, operating parameters of the equipment may be tuned for a desired result.
- The equipment may cooperate in an emergency. For example: In case of a fire, ventilation is turned off in the fire area reducing the oxygen available to the fire while other areas are pressurized to reduce smoke damage. After the fire, outside air is used to purge the smoke from the building.
- Some sensors may be shared by many devices. For example: One outside air temperature sensor may be shared by many devices resulting in lower installed cost.
- Custom features may be added to the building to accommodate the building use. For example:
  - Custom schemes may be designed to save energy; improve safety, security, or comfort.
  - A building owner may wish to charge extra energy cost when the building is occupied beyond normal hours. A billing device may monitor building occupancy to bill the tenant when the space is occupied beyond normal hours.

When the functionality of all the devices in a system are put together the benefits of system integration can be realized. For example the following devices may be shared all the devices on a network to provide benefits that one device type alone could not provide:

- Occupancy scheduler to provides occupancy related energy savings through a schedule for building occupancy
- Occupancy override provides one or more means for overriding the schedule when the building becomes occupied during a scheduled unoccupied period. Typically a user interface (may be a PC) is used to initiate an override period but turning on the lights manually or disarming the security system could be used to indicated occupancy.
- Off site communications device enables remote control and monitoring. For example:
  - The Echelon Serial LonTalk Adapter (SLTA) and a modem connects between a dial up telephone line and the LonWorks Network so a remote PC may monitor and control the building.
  - Internet server connects between a LonWorks network and the Internet (TC/IP) network enable a PC with Internet browser to monitor and control a building.
- An alarm logging device that receives alarms from devices and periodically checks devices for out of range conditions reports alarms to local and / or remote PCs.
- A trend logging device periodically records information from devices to store a trend log for troubleshooting.
- A user interface PC running building management software may do one or more of the following:
  - Local and / or remote communications to various sites including dial in capability for remote alarm logging.
  - Display a list of all the sites known to the building management software and a list of devices at each site.
  - Display the current status of devices.
  - Display and change occupancy schedules, zone set points, manual occupancy and other parameters.
  - Display and configure the alarm and trend logs.
  - Advanced features for multi site monitoring (scheduled periodic monitoring of buildings, change the schedule at multiple sites with only one entry, and others).
  - Manage user permissions, restricting the functions available to each user according to job description.
  - Configuration of the devices and the network (available only to installers and system integrators).
  - Manually control devices (available only to installers).
- Other devices may be needed in the system as determined by the application requirements and system integrator.

## LonWorks overview

Some of the features of the LonWorks system are:

- All devices use the LonTalk protocol defined and documented by Echelon Corporation. The protocol defines: electrical communications signals used by devices, the type of wire to use between devices, and how information is exchanged between devices.
- Each device contains a unique identifier called the neuron id. Most devices contain a microprocessor called the “neuron” and each neuron is given a unique 48-bit identifier at the time of manufacture. The neuron id is read by a PC tool during the installation process. An example of a neuron id is the hexadecimal number 00 01 3F EE 2F 7A.
- Each device has a unique address identifier. The unique addresses are assigned by a system integrator using a PC tool that keeps track of all the devices and their addresses in the system. The neuron ids, addresses, device names, and device types are saved in the tool database.
- Each device has information that may be shared with other devices. The information is stored in each device in “network variables” and optionally in “files”. Each device type has a set of network variables and files unique to the device type. PC tools read computer files that tell them what network variables and files are available in each device type.
- A device will report a network variable to other devices when ask or “polled” by another device. For example: water temperature, device state, alarms, etc., may be polled by a PC to display the current values on the screen. The PC needs a database of device addresses, device names, and device types to retrieve and display information from devices.
- A network variable in a source device may be “bound” to volunteer information to destination device(s). For example: the output network variable on the outdoor air temperature sensor may be bound (connected) to all the network variable inputs on devices that use outdoor air temperature. Whenever outdoor air temperature changes, the sensor sends the new temperature to all the devices that need it. Binding is done by the system integrator using a PC tool to tell the devices to bind the network variable output in one device to input network variables in another device(s). The binding information is saved in the PC tool database.
- All bound network variables are volunteered by the source device when the network variable value changes.
- Some bound network variables may also be volunteered by the source device periodically even if no change has been made. The periodic volunteering of information is called the heart – beat, and is used by the destination device(s) to determine that the source node is still working. If the destination device fails to receive the information periodically, the destination device will take alternative action.
- Some of the input network variables or files are stored in non-volatile memory and used by the device to tailor the device operation to the application. These variables are called “configuration parameters” and are set by the installer or system integrator using a PC tool. The configuration parameters are saved in the PC tool database.

**Honeywell**

**Home and Building Control**

Honeywell  
1985 Douglas Drive North  
Golden Valley, MN 55422

**Home and Building Control**

Honeywell Limited-Honeywell Limitée  
35 Dynamic Drive  
Scarborough, Ontario  
M1V 4Z9

**Honeywell International**

Home and Building Control  
Honeywell Building  
17 Changi Business Park Central 1  
Singapore 486073

**Honeywell Europe S.A.**

3 Avenue du Bourget  
1140 Brussels  
Belgium

**Honeywell Latin American  
Region**

480 Sawgrass Corporate Parkway  
Suite 200  
Sunrise FL 33325

