

LON INTEGRATION

Technical Documents: NiagaraAX 3.x Lonworks Guide, NiagaraAX 3.x Drivers Guide

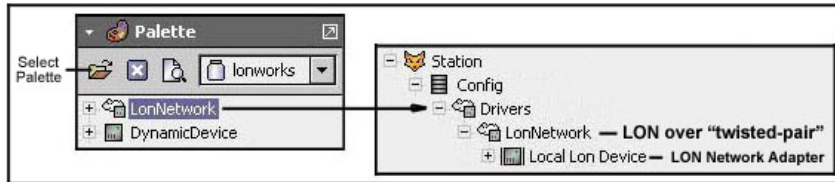
Note: the JACE must be licensed for LonWorks (see 'Basic Steps-Installing AX Workbench' section).

1 - CONFIGURE THE LON NETWORK

Add a LON Network

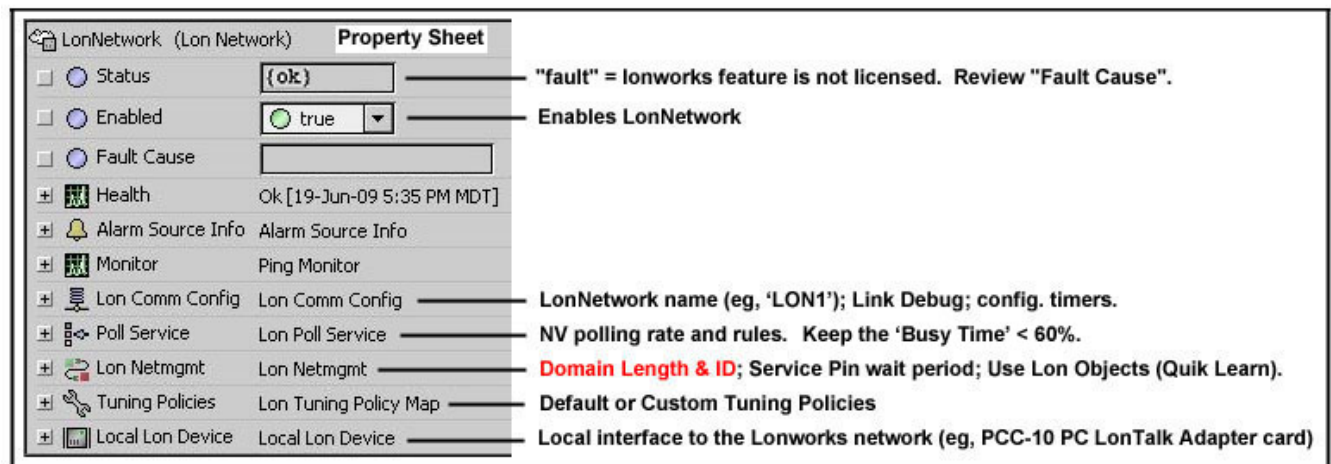
1. Open Config > Drivers.
2. Select 'lonworks' palette.
3. Drag the 'LonNetwork' component onto the 'Drivers' node (or select the 'New' button).
4. If the JACE has multiple LON ports, add a LonNetwork for each physical port. In 'Lon Comm Config' specify the port's Device Name (eg, LON1, LON2).

Note: the 'Local Lon Device' object represents the LON network adapter which Station uses to connect to the LON network.



Configure the LON Network Properties

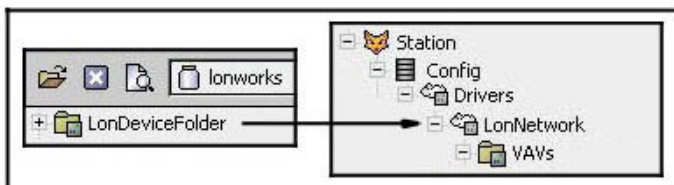
1. Open the LonNetwork Property Sheet (R.C. 'LonNetwork' > View)
 - 1) Alarm Source Info: set 'ToOffNormal' text (ping fail).
 - 2) Lon Comm Config: 'Device Name' must match the Host machine LON I/F device (eg, PCC10 card).
 - 3) Poll Service: if poll service > 60% during operation, set the service to Normal Rate (30sec).
 - 4) **Lon Netmgmt: default Domain length=0** (Honeywell default: Domain length=1; id = 2c). Important.
 - 5) Tuning Policy: duplicate a policy. Name it 'SlowPollPolicy' (freq=slow; max WT=2min; min=2s)
2. Set Unit Conversion to English (Tools > Options > General > Unit Conversion)
3. Set the Station Auto Save Frequency to 1 hour (Station > Config > Services > Platform Services)



2 - CREATE LON DEVICES

Manually Add Lon Devices (Off-line Engineering)

1. Open the 'lonworks' palette and drag a 'LonDeviceFolder' object onto the 'LonNetwork' node (for organization).
2. Name the folder (eg, VAVs).



3. Open the appropriate LON device palette.
4. Drag the LON device onto the Lon Device Folder (or 'LonNetwork' if not using folders).

Manually Add LON Devices Cont.)

5. Name the device (eg, VAV_1).



6. Set the device's configuration settings (eg, VAV: Ctrl type, OccCool setpoint). (see Honeywell section for XL10 VAV configuration)

7. Repeat the process to add more Lon devices.

8. Save the Station (right-click 'Station' > Save Station)

9. Continue to Section 3 – Device Matching.

Using Online Discover to Add Lon Devices (On-line Engineering)

The 'Discovery' process is an on-line process which learns what Lon devices are on the working domain (as defined in the LonNetwork property sheet; default Domain Len = 0).

1. Open the Lon Device Manager (double-click 'LonNetwork').

2. Click the 'Discover' button.

3. Discovered Lon devices will appear in the 'Discovered' pane (top).

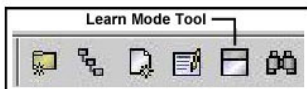
(if you do not see a Lon device in the Discover pane, check the Domain ID)

4. Select the devices then click 'Add'.

5. In the 'Add' dialog box edit the device name(s). OK.

6. The desired Lon devices should appear in the 'Database' pane (lower).

7. To close the split-pane, click the Learn Mode tool to toggle out of 'learn' mode.



Learn Lon Devices (On-line Engineering)

'Quik Learn' is a Device Manager tool that combines the 'Discover' and 'Add' steps into one operation. Besides *first-time learning* of new networks, Quik Learn can be used to add Lon devices to an already configured network.

Note: Quik Learn searches locally-installed lon<vendor> modules to find possible .Inml files. This differs from a 'Discover' and 'Add', where all modules used by Workbench are searched. Important that any needed Lon modules are installed on the JACE platform before running Quik Learn.

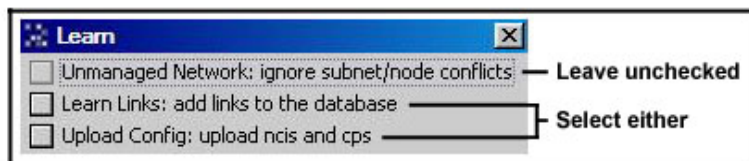
To Populate a New Network from a Previously Managed Network

Managed Lon devices have unique subnet/node addresses, are configured and often have bindings with other devices. In this case, you usually want to learn all the existing network management. "Managed" preserves the commissioning of all the nodes where the initial state is "Config Online".

1. Open the Lon Device Manager (double-click the 'LonNetwork').

2. Click the 'Quik Learn' button (bottom).

3. In the 'Learn' dialog, select "Learn Links" or "Upload Config" (leave "Unmanaged Network" cleared).



Learn Links: allows you to view the learned bindings in other views of the LonNetwork, including the LonWorks Link Manager view or in the network wire sheet view

Upload Config: allows you to see the values of any device's NCIs from its Nc Manager view (right-click the device and select Views > Nc Manager).

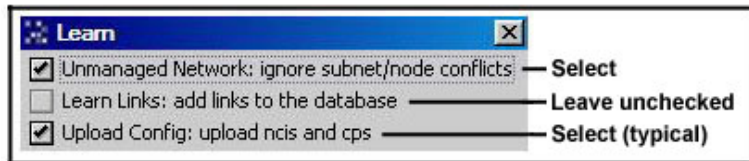
4. Learned Lon nodes are listed in the 'Database' table. All devices should appear listed with unique subnet/node address. Use the Lon Link Manager to view the learned bindings. To view the values of the device's ncis use the 'Nc Manager' (Views > Nc Manager). (note: 'Commission' is not performed in 'Previously Managed Network')

Learn LON Devices Cont.)

To Populate a New Network from Previously Unmanaged Network

Unmanaged Lon devices are unconfigured – Lon devices can only respond to it Neuron ID rather than the subnet/node address. Lon bindings between devices do not exist. There is no existing Lon network management to learn (only to be establish for the first time). Avoids the strong possibility in having duplicate address or other address conflicts.

1. Open the Lon Device Manager (double-click the 'LonNetwork').
2. Click the 'Quick Learn' button (bottom).
3. In the 'Learn' dialog, select "Unmanaged Network" and, typically, "Upload Config".



4. Select all the devices in the 'Database' table.
5. Click the 'Commission' button.

3 – DEVICE MATCHING

The 'Match' function maps the manually added Lon devices (off-line database) with on-line 'discovered' Lon devices. A match is possible only if the program IDs are the same. The match synchronizes the Lonworks neuron ID and applies appropriate subnet-node logical addressing. Note: JACE controllers must be commissioned before they can be discovered (see JACE section for commissioning).

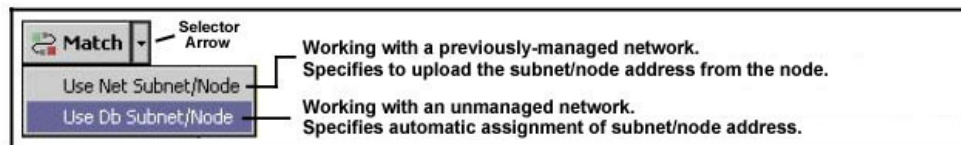
Discover & Match Devices (On-line)

1. Open the Lon Device Manager (double-click the 'LonNetwork').
2. Locate the Lon Controller and double-click it.
3. Review the controller's logical address: 1) Channel ID, 2) Subnet #, 3) Node #. Update as required. Click OK.

4. Click the 'Discover' button ('Discover' sends a broadcast message).

Discovered					
State	Subnet	Node	Manufacturer	Program Id	Neuron Id
Config Online	1	1	Honeywell	80 00 0c 50 1e 03 04 01	04 cd 84 42 02 00

5. Select (highlight) the controller in the 'Discovered' pane and in the 'Database' pane. If the controller does not show up in the 'Discovered' pane, use the controller's Service Pin to discover it.
- 6a. Select the appropriate Match function > Use the black arrow next to the 'Match' button, select:
 - "Use Net Subnet/Node" – to upload the logical address from the device (node).
 - "Use Db Subnet/Node" – for automatic assignment of logical address (subnet/node).(be careful with the selection tool – if the selection you want is already selected, click off the menu to close it.)



- 6b. Click the 'Match' button. As need, edit any properties (eg, Node #) as required.
7. Click OK.

Commission & Download the Controller

Niagara Process:

- 1) Commission
- 2) Download
- 3) Bind

New LON Controller

Commissioning sets the controller's logical address: 1) Channel ID, 2) Subnet #, 3) Node #.

1. Select the Lon Controller and the 'Local LON Device' in the Database window.

Database										2 objects
Name	Type	Exts	State	Subnet	Node	Fault Cause	Manufacturer	Program Id	Neuro	
Local Lon Device	Local Lon Device		Config Online	1	127		Tridium	90 00 8e 01 03 80 00 03	04 8d 1d 2	
RTU_01	Cvahu		Unknown	1	1		Honeywell	80 00 0c 50 1e 03 04 01	04 cd 84 4	

2. Click the 'Commission' button (note the status indicator at the top of the window).
3. Download when the commission is complete (right-click the Lon Controller > Actions > Download).
4. The controller state should display 'Config Online'. If not, go to the device's property and manually set the state to 'Config Online'.

Database					
Name	Type	Exts	State	Subnet	Node
Local Lon Device	LonDevice		Config Online	1	127
Ahu1	Cvahu		Config Online	1	6
Ahu2	Cvahu		Config Online	1	12
Ahu3	Cvahu		Config Online	1	4

Config Online

Edit

☐ Name: Ahu1

☐ State: Config Online

☐ Channel Id: 1

☐ Subnet: 1

☐ Node: 6

☐ Program Id: 80 00 0c 50 1e 03 04 01

☐ Neuron Id: 00 a3 29 28 40 00

☐ Enabled: ☒ true

☐ Lon Xml File: local:|module://lonhoneywellAXWizards/Cvahu.lnml

Existing LON Controller

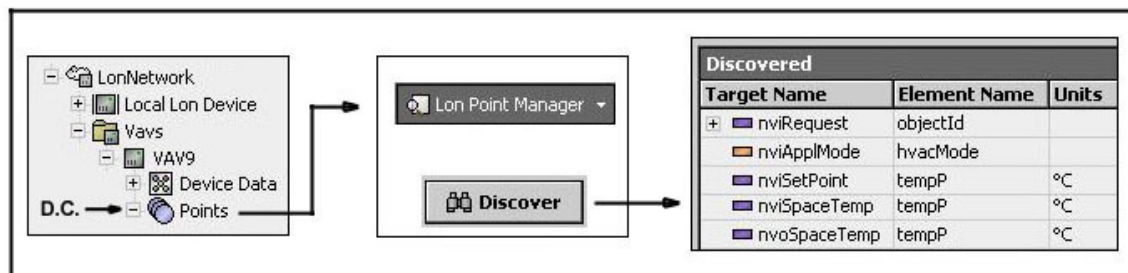
If you re-commission an existing LON controller all of the bindings will break. Use Quik Learn to discover the device(s) and use the 'Replace' feature to re-commission the device(s) to avoid breaking the LON bindings.

4 – CREATE LON PROXY POINTS

Proxy the Points into the Station

Discovering and adding points to the Station is known as 'proxying the points into the Station'.

1. Open the Lon Point Manager (double-click the 'Points' folder of the Lon device).
2. Click the 'Discover' button (bottom). Discovered network variables (nvi, nvo, nci) are listed in the top pane (split pane = learn mode). Each row in the Discovered table represents one Lon proxy point candidate.



CREATE LON PROXY POINTS Cont.)

3. Select the required points and drag and drop them from the 'Discover' pane (top) into the 'Database' pane (bottom).
4. Edit the point's properties (name, type, facets) as required.

Add

Name	Type	Target	Element	Facets	Conversion	Link Type
nvoCtlDataG2_SpaceTemp	Numeric Point	nvoCtlDataG2	SpaceTemp	units=°F, Default	Standard	

Name

nvoCtlDataG2_SpaceTemp

"nvi, nvo or nci" name. Data structure includes a trailing element name ("SpaceTemp") for unique point.

Type

Numeric Point

nvis & ncis = "writable"; nvos = "read-only"

Target

nvoCtlDataG2

LonComponent represented by the proxy point.

Element

SpaceTemp

Data element if a structure, or the SNVT type if unstructured.

Facets

units=°F,precision=3,min=-256.00,max=255.99

>> Click '>>' to Edit Facets

Conversion

Default

Conversion to use between "read value" and the parent point's facets.

Link Type

Standard

Lon service type to use when binding to this item.

LON Network Variable Prefixes

nvi	Network Variable Input
nvo	Network Variable Output
nci	Configuration Property Network Variable Input stored in Non-Volatile Memory
nro	Network Variable Output stored in Non-Volatile Memory

Alternative Method: Add Points from a Personal Palette

1. Open the Personal Palette and the appropriate folder (with the device's points).
2. Copy the required points and paste them into the Lon device's 'Points' folder (or sub-folder).

Control Strategy Reminders

1. Edit the four numeric writable setpoints to establish default setpoint values (OccCool, UnOccCool, OccHeat, UnOccHeat). To set the setpoint value: right-click the setpoint > Actions > Set. Note: setpoints will not update until the device is on-line.
2. Add point extensions as required (eg, Totalizer, Alarm, History).
3. Use the Composite editor to expose required slots for specific control logic (eg, 'Reset Elapsed Active Time').

5 – BIND LON PROXY POINTS

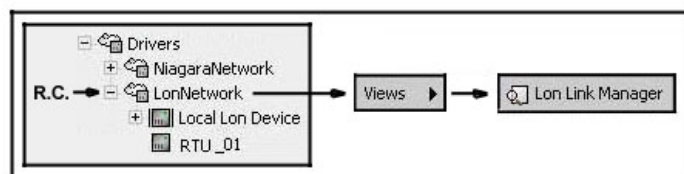
Sharing points (eg, OAT) between Lon Devices is a two-step process:

- 1) Binding: Peer-to-Peer Connection.
- 2) Linking the points.

Binding: Peer-to-Peer Connection

The LON Link Manager changes what the station treats as polled connections into bound connections. After 'Binding' the link resides in the network rather than the JACE. This allows the connection to be a true peer-to-peer connection (LonTalk protocol – ISO 14908). Without using the Link Manager all communications must go through the station (JACE), because the LON devices don't know about the connections. Polled traffic typically results in more traffic on the Lon network. With Peer-to-Peer binding, communication between the Lon devices is unaffected if the JACE communication fails, or even if the JACE is turned off. If binding is not performed, the connection will still work, but the connection will function as a polled connection (JACE communication and power must be functional).

1. Open the Lon Link Manager (R.C. LonNetwork > Views > Lon Link Manager)



2. Select the desired binding connection.

If the point has multiple datafields, like 'nviTodEvent', select one of the point connections (eg, 'CurrentState'). All of the other datafields should highlight.

NetworkVariableLinks						
selector	linkStatus	srcDevice	srcNv	targetDevice	targetNv	linkType
1	New Link	RTU_01	nvoCtlDataG2	LocalDev	SpaceTemp	standard
3	New Link	LocalDev	CurrentState	RTU_01	nviTodEvent	standard
3	New Link	LocalDev	NextState	RTU_01	nviTodEvent	standard
3	New Link	LocalDev	TUNCO5	RTU_01	nviTodEvent	standard

Binding: Peer-to-Peer Connection Cont.)

3. Click the 'Set Service Type' button. Set the service type to 'Reliable' (repeated).
4. Click the Bind button (bottom) to complete the connection. This binds the JACE points to the network card.

Note1: with a functioning Lon card, you will see the connections, but the linkStatus will display as 'Device Error'.

Note2: if the controller is re-commissioned the bindings will have to be redone.

Linking the Points

1. R.C. the master Lon device (eg, with OAT sensor).
2. Select 'Copy'
3. R.C. the LonNetwork > 'Paste Special'.
4. Set the # of copies to 1
5. Select the 'Keep All Links' > 'OK'
6. Remote the OAT sensor from the slave Lon device (use the configuration window).
7. Open the Wire Sheet of the LonNetwork.
8. Connect the temperature points:
9. Drag a link from the output side of the grey bar (bottom) on the master Lon device to the input side of the grey bar on the slave Lon device. The Link Box will appear:



10. From the [Source] select 'nvoOdTemp'. From the [Target] select 'nviOdTemp'. Click 'OK'.
11. Copy the slave Lon device.
12. Create new Lon devices with the 'Paste Special' function. Keep all the links.
13. Open the Lon Link Manager.
14. Select all the new bindings.
15. Click the 'Selective Bind' button.

Point Notes:

- 1) 'nviSetpoint' – not a true setpoint. Applies to middle of deadband. True setpoint is 'nvisetpoint' +/- the deviation.
- 2) Flow Setpoint is shared as a % of max. flow.
- 3) nvoShare linked to nviShare – all parameters get shared. Satellite function (group binding).
- 4) Lon Points in structured folders: CVAHU: 'nvoControlDataG1' & 'G2'; VAV: 'nvoControlDataG'.

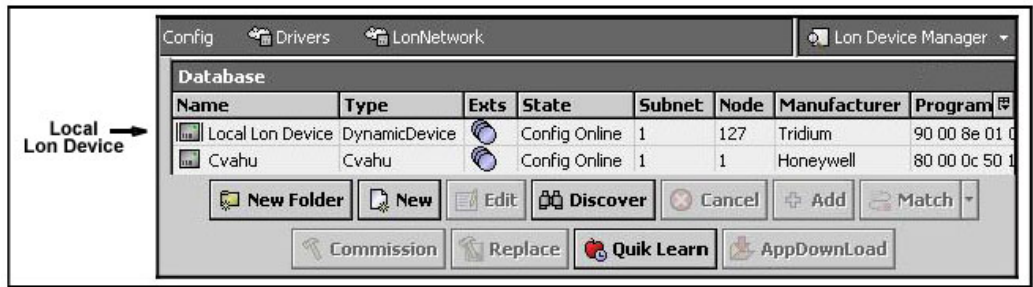
LON NETWORK VIEWS

Technical Document: Niagara AX-3.x LonWorks Guide, pg. 3-13.

To facilitate network management, the LonNetwork provides four different manager views.

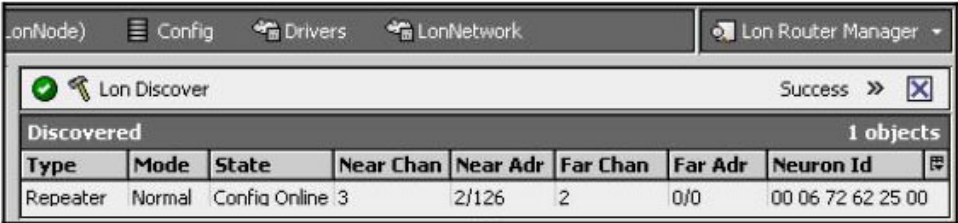
Right-click 'LonNetwork' > Views:

1) Lon Device Manager View – provides support for learning (or discovering/adding) Lonworks devices to the database, for managing device addresses, and downloading standard applications to devices.

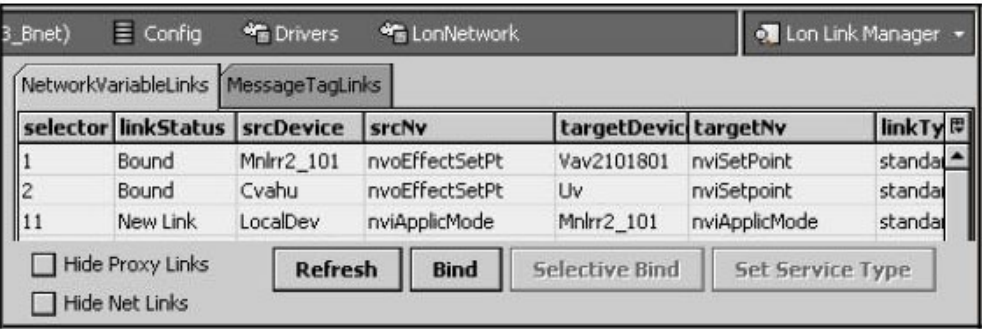


The 'Local Lon Device' represents the local interface to the LonWorks network. It is modeled similar to any other Lon device, however it cannot be deleted or duplicated. As of AX-3.4 you can use Workbench to create an .xif file (external I/F file) of the LocalLonDevice (right-click action). The .xif file describes the JACE's Lonworks capabilities and can be used by another LonWorks network management tool for offline engineering.

2) Lon Router Manager View – provides support for discovering and adding Lonworks routers to the database, and for managing router addresses.



3) Lon Link Manager View – provides support where you can review/manage the bindings of the network variables. Key view since Niagara Station is typically "the network manager". Use the Link Manager to change a point to 'poll only'.



4) Lon Utilities Manager View – provides support to perform a variety of queries to both devices in the LonNetwork and discovered nodes. Example: see [Tasks] – 'To Identify a LON Device Using its Service Pin'.

LON DEVICE VIEWS

Technical Document: Niagara AX-3.x LonWorks Guide, pg. 3-31.

Any Lon device has two special manager views, in addition to the standard component views (property sheet, wire sheet, category sheet, slot sheet, link sheet). These views are:

1a) Local Nv Manager – applies only to the 'Local Lon Device'. Used to view custom Lon network variables (nvis, nvos, ncis) when the station is configured as a 'Lon Node' (see section 'Station as a Lon Node').

1b) Nv Manager View – allows you to browse through a table of the devices nvs (nvi, nvo) LonComponents, showing a number of sortable columns of data. You can use the standard table edit controls to change the number and types of data displayed in this view. Summary data is updated dynamically through polling.

LON DEVICE ACTIONS

Each Lon device has the following right-click actions:

1) Ping – attempts communication with the device. If successful, the device's status is ok. If this fails, the device's status is set to down.

2) Upload – reads transient (nvs) and persistent (ncis and cps) data from the device and writes to the station database (Lon device). Recursive upload is always recommended. After using 'Discover' and 'Add' to create a new Lon device (and assigning the device a Lon Xml file), you can use Upload to populate current LonData in the device's LonComponents (nvs, ncis, cps). The Quik Learn feature includes the Upload process.

3) Download – writes persistent data (ncis and cps) to the device from values in the station database (Lon Device).

4) Reset – issues a reset command to the device.

5) Learn Nv – builds the Lon device's child LonComponents as a collection of nvs, ncis, and (if available) cps based on the Lonworks self-documentation that resides in the device. Use Learn Nv *only* if there is no available Lon Xml (lnml) file for a device, or if the device has a programmable (changeable) external interface.

Note: if you perform a Learn Nv on any Lon device previously using a Lon Xml file, LonComponent data from any manufacture-define type info is lost. Workbench does not allow a Learn Nv if the Lon device has an "Xml File" property that is not "null".

6) Trim – used to automatically *remove* a Lon device's LonComponent nvi and nvo slots that do not have an associated Lon proxy point, or that are not linked, or have a Px bind. This can conserve station memory and allows database support for more devices. Otherwise, you can manually delete individual nvi/nvo LonComponent slots that have no interest. To restore deleted nvis and nvos, perform an ImportXml command on the device.

[Tasks]

Sharing a Wall Module between two VAV Controllers

The steps below shows how to bind two VAV controllers (Lon devices). The binding is peer-to-peer so that each VAV can communicate with each other without having to go through the WEB Controller (JACE).

1. Open the Configuration Window on the 'slave' VAV controller.
2. Change the Flow Type setting to 'Shared Wall Module'.
3. Open the wire sheet of the LonNetwork.
4. Drag a link from the output side of the grey bar (bottom) on the master controller to the input side of the grey bar on the slave controller. The Link Box will appear:

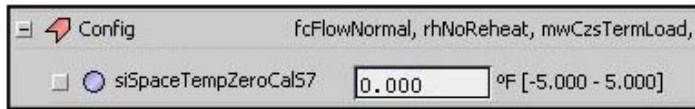


5. From the [Source] select 'nvoShare'. From the [Target] select 'nviShare'. Click 'OK'
6. Open the Points Folder in the slave VAV controller.
7. Delete all the point from the Points folder except the following:
 - FlowControlPt
 - BoxFlow
 - DamperPos
 - ReheatPos
8. Open the LON Link Manager (R.C. LonNetwork > View > LON Link Manager).
9. Review the connections in the window.
10. Click the 'Bind' button to complete the connections

Calibrating the Sensor of an VAV or CVAHU Controller

VAV Controller

1. Open the VAV controller Property Sheet.
2. Temperature: locate the 'siSpaceTempZeroCalS7' object from the Config object:



3. Set the value (the entered value is added to the sensed value).
4. Save the change.

CVAHU Controller

1. Open the CVAHU controller Property Sheet.
2. Expand the view of the 'nciconfig' object
3. Temperature: locate the 'SpaceTempZeroCal'. Set the appropriate value.
4. Resistive: locate the 'ResistiveOffsetCalAI1'. Set the appropriate value.
5. Save the change.

To View a Device Current Domain Table

The device's Domain Table lists the domain length and ID. If the device's domain length must match the LonNetwork's working domain (to edit: LonNetwork > View).

1. Right-click the LonNetwork > Views > Lon Utilities Manager.
2. Near the bottom, click the (device) drop-down and select the node just found from a service pin.
3. Click the lower-left drop-down control (command menu) and select 'Data Structs'. To the right (command submenu), click the drop-down control and select 'Domain Table'.
4. Click the 'Execute' button.

To Import an XML File to a Remote JACE

Each Lon device (DynamicDevice) has an available right-click 'ImportXml' command in Workbench. This command provides a popup dialog that displays the specified .Inml file – as stored in the device's 'Lon Xml' property, and allows you to change it (if needed).

Typically, this command is used only if programming offline, when devices (and their associated Inml files) cannot be automatically learned. This same functionality is automatically provided when you "Add" discovered Lon devices, providing that a Lon Xml file was found for the device.

Issue: If a remote JACE does not have the same module already installed at the local host.

1. Right-click the device (that came from local module palette).
2. Select the 'ImportXmlcommand'.
3. The following should appear: "module://lon<vendor>/<device>.Inml".
4. Click OK.

Data will be read from the local .Inml file into the device component in the remote station. The device is now ready for offline programming, or if online with the JACE, ready for matching with an actual device.

To Add a Dynamic Device

(See Honeywell: XL5K Integration)

Saving the Device and Points in the Personal Palette

1. Open the Wire Sheet of your Personal Palette (create a new folder if necessary).
2. Copy the Lon device onto the Wire Sheet.
3. Save the palette.

To Replicate a Device

1. 'Copy' the first device.
 2. Select 'Paste Special'.
 3. Choose 'Keep All Links' and specify the number of copies.
- Note: if you modify any of the settings (eg, Float Reheat), click on the 'Commit' button.

To Create a Device Folder

1. To organize the devices within a project, special device folders are used.
2. Open the 'lonworks' palette.
3. Drag a 'LonDeviceFolder' onto the 'LonNetwork'.
4. Name the folder (eg, RTU_Devices)
5. Select all the devices and 'move' them to the new folder.
6. Repeat for other types of devices (eg, VAV_1F)

Note: R.C. the LonDeviceFolder > Actions > Download option available.

To duplicate Folders

1. R.C. folder (eg, VAV_1F)
2. Select 'Copy'.
3. R.C. the 'LonNetwork'.
4. Select 'Paste Special' & 'Keep Links'.
5. Name the new folder (eg, VAV_2F).
6. Use the 'Replace With' function to rename the devices within the folders.

To Identify a LON Device Using its Service Pin

In Niagara AX you do not have to expressly listen for a service pin message. In the Lon Device Manager, any unsolicited service pin message is handled as follows:

- If the node is *not* represented *in the database*, it is added to the Discovery table (learn mode).
- If the node is already *in the database*, it becomes *selected* (highlighted) in the Database table.

1. Open the Lon Utilities Manager (right-click 'LonNetwork' > Views)
2. Configure the drop-down menus (bottom):
 - 1) Command: select 'Identify'.
 - 2) SubCommand: select 'Service Pin'.



3. Click the 'Execute' button.
4. Press the service Pin of the Lon Device.
5. Review the device's Domain Length and ID. It must match the LonNetwork's working domain (see the LonNetwork's property sheet).

To Replace a LON Device

Before removal, if possible, run a verify report using the Lon Utilities Manager. Review for any errors. Confirm that the device's NV bind configuration matches the network management stored in Niagara.

1. Remove the Lon device and replace with an identical type.
2. Open Lon Device Manager.
3. Highlight the original device.
4. Click on 'Replace' (bottom).
5. Use Service Pin or Neuron ID to set the physical address.
6. Verification is made that the new device's program ID matches the programId stored in the existing Lon Device. The device's domain table is initialized and the all entries in the address table are set to match the station database.
7. The Node is set to state: "Configured, online".
8. Using Lon Utilities Manager, examine the device's internal tables.

To determine the Busy Time of a Lon Network

1. Close any Property Sheets or Control Programs that may be in use.
2. LonNetwork > Lon Link Manager view. Verify that all links are bound.
3. Open the LonNetwork property sheet and expand the Poll Service property.
4. Right-click the Poll Service property > Actions > Reset Statistics.
5. Wait a few minutes for new data to be collected.
6. If the Busy Time exceeds 60%, increase the Normal Rate poll interval and repeat steps 4-6. (A good starting Normal Rate value is 30 seconds.)

Troubleshooting

Issue: VAV Box Effective Setpoint is locked; unable to change setpoints; very high cfm #.

Resolve: configuration is ok; 'commission' doesn't work; Power boot VAV controller doesn't work.

Fix: Rediscover VAV controller.

Record all the VAV setpoints (ie Occ. Htg/Clg; Unocc. Htg/Clg)

1) LON Device Manager:

1. Delete VAV controller.
2. Discover.
3. Add
 - 1) Name: (VAV box name)
 - 2) Type: Excel10VAV (important)
 - 3) LON Xml File: local module://lonhoneywellAxWizards/vavxxx.lnml
4. Commission

2) Graphics Update:

- 1a. Right click VAV box: 'New View' > select existing template (eg, 'VAV')
- 1b. "File already exists"
- 1c. Reuse.
- 2a. Copy all the points from a good VAV box (point container).
- 2b. Paste the points to the new VAV box (point container). Auto recognize.
3. Update the Setpoints
4. Update the VAV Menu: jump to VAV graphic
 - 1) Drag the updated VAV Box to the PxEditor.
 - 2) Record the slot path.
 - 3) Update the VAV 'jump to graphic' properties using the slot path:
 1. Ord
 2. Hyperlink

3) Unable to write to a nci point (LON heat pump).

1. Review the .lnml file.
2. Replaced all modifyFlag fields that contained the value "mfgOnly" with "readWrite" for all of the nci points (use a text editor).
3. Discover as writable points.

Misc. Notes

nviTodEvent & Intelligent Recovery

Niagara requires more engineering than Honeywell regarding the nviTodEvent point.

nviTodEvent point has three parts:

1. 'Current State' - Enum writable
2. 'Next State' – Enum writable
3. Time to Next State' (also known as TUNCOS – 'Time Until Next Change of State'). Starts at a predetermined value and counts down to zero.

Intelligent Recovery avoids a sudden step change in setpoint by gradually ramping down the setpoint.

If you don't specify 'Next State' the ctrl. will assume Occupied.

If you don't specify 'TUNCOS' the ctrl. will assume the value '0'.

Niagara does not compensate for this, you must manage it.

Edit the Current State, Next State, TUNCOS: text, Facets, etc

Niagara does not provide a slot for TUNCOS in the Enum Schedule. Resolve: use schedule from the Personal Palette called "EnumScheduleWithTUNCOS".

Note: if performing multiple controllers copies, the schedule in the controller logic will get repeated as well. Typically, only one master schedule is required.

To cancel Intelligent Recovery you must command it (no need for TUNCOS).

Network Variables

SNVT – Std. NV Types. Permits successful data interchange between manufactures' controllers. Rules like temperature is broadcast as Celsius.

UNVT – User-defined NV Types. (eg, nvoCtlDataG1 – structured NV). Not required to follow LonMark rules.

You can select points within nvoCtlDataG1, put into the Database and Edit in the 'Add' window.

Boolean Point must have "TrueText" and "FalseText" facets.

Types are Read only for nvo's (no writable points).

Station as a LON Node

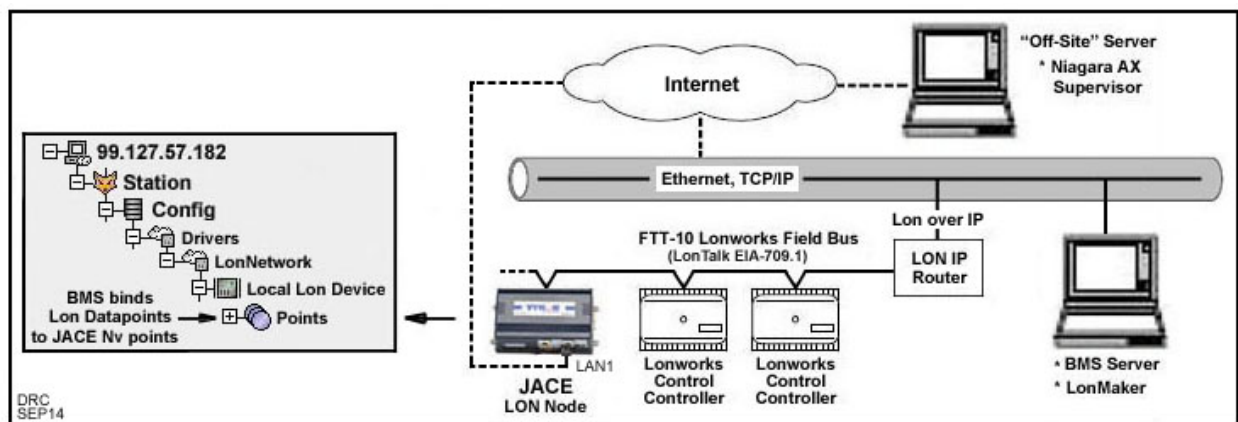
Technical Documents: NiagaraAX 3.x Lonworks Guide, NiagaraAX 3.x Drivers Guide

Note: the JACE must be licensed for LonWorks (see 'Basic Steps-Installing AX Workbench' section).

When configuring the Station as a Lonworks node (only), the Station appears as a "peer" Lonworks device. In this scenario, Lonworks network management is not handled by the Station. You do not use the various LonNetwork views that provide the interface to Lonworks network management. Instead, you work only in (and under) the 'Local Lon Device' when engineering the Station.

When a JACE is installed as another 'Lonworks node', where another (external) Lonworks network management tool is used (eg, LonMaker), you configure the 'Local Lon Device' to not perform network management. You expose Station data as network variables (nvs) and ncis under the Local Lon Device. The Container 'Points' of the Local Lon Device is equivalent to the 'Export Table' of the Bacnet Local Device ('Export Points').

One application is the data sharing between a BAS server and a JACE. Lon 'binding' is required on the BAS side.



Set the Local Lon Device: External Config Property

1. Set External Config = True.
2. Set Self Doc = &3.0@0 < other text>



Create New LON Network Variable (Nv) Point

1. Open the Local Nv Manager (double click 'Local Lon Device')
2. Select 'New' (bottom).



3. For more than 1 point, update the 'Number to Add' field. OK.

Create New LON Network Variable (Nv) Point Cont.)

Name	Direction	SnvtType	SelfDoc	Lnml File	Type
LocalNv	Input	Snvt Xxx		null	0

☐ Name: LocalNv
☐ Direction: Input
☐ SnvtType: Snvt Xxx
☐ SelfDoc:
☐ Lnml File: null
☐ Type: 0

OK Cancel

4. Update: 1) Name, 2) Direction (input=data from BMS; output=data to BMS), 3) Snvt Type.

Name	Direction	SnvtType	SelfDoc	Lnml File	Type
AHU7SAT	Input	Snvt tempP		null	0

☐ Name: AHU7SAT
☐ Direction: Input
☐ SnvtType: Snvt tempP
☐ SelfDoc:
☐ Lnml File: null
☐ Type: 0

OK Cancel

5. OK.

6. Right-click the new Nv point > '+Add'.

AHU7SAT + Add

7. Update 'Type' (Numeric or Boolean)

Name	Type	Target	Element	Facets	Conversion	Link Type
AHU7SAT	Numeric Point	AHU7SAT	tempP	units=°C,precision=3,min=-273.17,max=327.66	Default	Standard

☐ Name: AHU7SAT
☐ Type: Numeric Point
☐ Target: AHU7SAT
☐ Element: tempP
☐ Facets: units=°C,precision=3,min=-273.17,max=327.66
☐ Conversion: Default
☐ Link Type: Standard

OK Cancel

8. Update Facets & precision. For Boolean points, the following instructs on how to modify the facets of the Off/On states.

Facets units=°C,precision=3 >>

Key	Type	Value
range	EnumRange	{stateOff=...

OK Cancel

OK Cancel

Ordinal	Tag	Display
-1	stateNul	stateNul
0	stateOff	stateOff
1	stateOn	stateOn

OK Cancel

Create New LON Network Variable (Nv) Point Cont.)

9. Remove the “-1” Ordinal.

Ordinal	Tag	Display
-1	stateNul	stateNul
0	stateOff	stateOff
1	stateOn	stateOn

10. Modify the display text for the '0' {Off} and '1' {On} states.

Ordinal	Tag	Display
0	stateOff	stateOff
1	stateOn	stateOn

0 Disable

Add Modify Remove

Ordinal	Tag	Display
0	Disable	Disable
1	stateOn	stateOn

1 Enable

Add Modify Remove

11. Repeat steps 1-10 for other points.

12. Link-Mark Nv point to Proxy Point.

13. Use BAS LonWorks tool to map BAS Lon datapoints to JACE Nv points (in Container Points folder).

Technical Notes

For LNS compatibility. LocalLonDevice requires:

- 1) SNVT_obj_request
- 2) SNVT_obj_status

LocalLonDevice Startup

1. Address is set to default: channel Id 1, subnet node 1/127
2. DeviceData is filled in from local neuron: Neuron Id, Address Count,

Upon Station startup, the following occurs:

1. Updates to domain table, address table, and device state per station database.
2. Program Id is set.
3. Executes ping.

Create New LON Network Variable (Nv) Point Cont.)

Name	Direction	SnvtType	SelfDoc	Lnml File	Type
LocalNv	Input	Snvt Xxx		null	0

☐ Name: LocalNv
☐ Direction: Input
☐ SnvtType: Snvt Xxx
☐ SelfDoc:
☐ Lnml File: null
☐ Type: 0

OK Cancel

4. Update: 1) Name, 2) Direction (input=data from BMS; output=data to BMS), 3) Snvt Type.

Name	Direction	SnvtType	SelfDoc	Lnml File	Type
AHU7SAT	Input	Snvt tempP		null	0

☐ Name: AHU7SAT
☐ Direction: Input
☐ SnvtType: Snvt tempP
☐ SelfDoc:
☐ Lnml File: null
☐ Type: 0

OK Cancel

5. OK.

6. Right-click the new Nv point > '+Add'.

AHU7SAT + Add

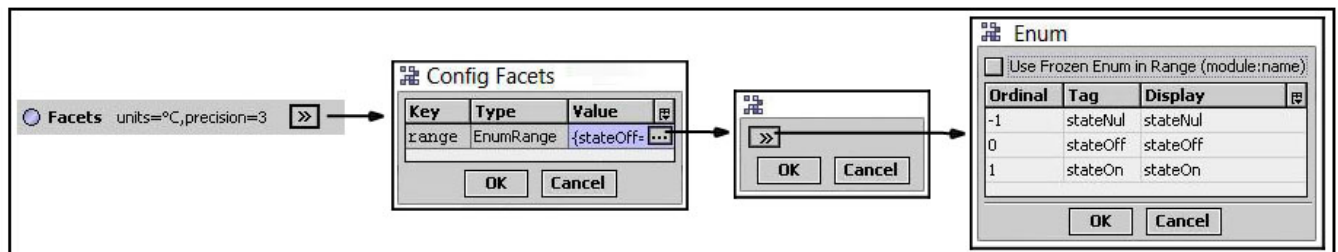
7. Update 'Type' (Numeric or Boolean)

Name	Type	Target	Element	Facets	Conversion	Link Type
AHU7SAT	Numeric Point	AHU7SAT	tempP	units=°C,precision=3,min=-273.17,max=327.66	Default	Standard

☐ Name: AHU7SAT
☐ Type: Numeric Point
☐ Target: AHU7SAT
☐ Element: tempP
☐ Facets: units=°C,precision=3,min=-273.17,max=327.66
☐ Conversion: Default
☐ Link Type: Standard

OK Cancel

8. Update Facets & precision. For Boolean points, the following instructs on how to modify the facets of the Off/On states.



Create New LON Network Variable (Nv) Point Cont.)

9. Remove the “-1” Ordinal.

Enum

☐ Use Frozen Enum in Range

Ordinal	Tag	Display
-1	stateNul	stateNul
0	stateOff	stateOff
1	stateOn	stateOn

10. Modify the display text for the '0' {Off} and '1' {On} states.

'0' State {Off} = 'Disable'

Ordinal	Tag	Display
0	stateOff	stateOff
1	stateOn	stateOn

0

Disable

Add Modify Remove

'1' State {On} = 'Enable'

Ordinal	Tag	Display
0	Disable	Disable
1	stateOn	stateOn

1

Enable

Add Modify Remove

11. Repeat steps 1-10 for other points.

12. Link-Mark Nv point to Proxy Point.

13. Use BAS LonWorks tool to map BAS Lon datapoints to JACE Nv points (in Container Points folder).

Technical Notes

For LNS compatibility. LocalLonDevice requires:

- 1) SNVT_obj_request
- 2) SNVT_obj_status

LocalLonDevice Startup

1. Address is set to default: channel Id 1, subnet node 1/127
2. DeviceData is filled in from local neuron: Neuron Id, Address Count,

Upon Station startup, the following occurs:

1. Updates to domain table, address table, and device state per station database.
2. Program Id is set.
3. Executes ping.

LON Integration: LON Over IP

Technical Document: NiagaraAX 3.x Lonworks Guide, Appendix C

In LON Over IP ('LonIpNetwork' driver) LonTalk packets are transmitted over the Ethernet Port. In this scenario the Neuron ID is virtual which requires that the network manager be an *external* manager (eg, LonMaker). Station is not the network manager.

LON Over IP is useful if you need to integrate an existing LON network with a new JACE + associated LON devices (eg, microzone controllers). This eliminates the need to re-engineer existing bindings.

The restriction of LON Over IP is that you cannot use the Points Container of the Local Lon Device to export data to a BMS server (due to a virtual Neuron ID). (to pass Lon data to & from a BMS server, see 'Station as LON Node').

