NodeLoad Utility User's Guide

ECHELON®
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Contents

The NodeLoad Utility

The NodeLoad Utility lets you download transceiver parameters or application software into Echelon's Free Topology Smart Transceivers (FT 3120®, FT 3150®, and FT 5000 Smart Transceivers), Echelon's Power Line Smart Transceivers (PL 3120, PL 3150, and PL 3170™ Smart Transceivers), and Echelon's Neuron® 5000 Processor, even after they have been soldered into a device.

Using the NodeLoad Utility

The NodeLoad utility is a Microsoft® Windows® console application that you can call from your functional test software. The NodeLoad utility is compatible with most LONWORKS® network interface adapters, including the following devices:

- *i*.LON® 10 Ethernet Adapter
- *i*.LON 100 Internet Server
- U10 and U20 USB Network Interface
- PCLTA-21 PCI Network Interface
- PCC-10 PC Card Network Interface
- SLTA-10 Serial LonTalk® Adapter

The NodeLoad utility is not limited to the interface adapters listed. Any interface that supports the LDV32.DLL should work with the NodeLoad utility.

Getting Started

Before calling NodeLoad, make sure that the network interface driver for the selected network interface is installed and is appropriately configured for your hardware. See the documentation for your selected network interface for details.

Open the Windows command prompt:

- For Windows XP: From the **Start** menu, select **Programs → Accessories → Command Prompt**. Set the path to the folder that contains the NodeLoad utility.

- For Windows Vista: Click the **Start** icon, click **All Programs**, expand the **Accessories** menu, then click **Command Prompt**. Set the path to the folder that contains the NodeLoad utility.

You can now run NodeLoad.

Command Line Options

The NodeLoad utility accepts the command line arguments listed in the following table.

Argument	Description
-B	Bypass the LNS® interface and go directly to the OpenLDV™ interface. NodeLoad can share the LNS interface with other LNS applications—the OpenLDV interface cannot be shared. *Note: By default, NodeLoad automatically uses the LNS interface if the LNS software is installed, and use the OpenLDV interface if there is no LNS software.*
-C	Suppress the device initialization prompt after an application download is finished and leave the device unconfigured.

Argument	Description

-D	Specify the LONWORKS network interface. For example:
	
	    `-DLON2`
	    `-D\\.\xlonusb0`
	
	To specify an i.LON 10 or i.LON 100 as the network interface, use the form X.*Profile.iLONname*. For example:
	
	    `-DX.Default.iLONatHQ`
	
	LON1 is the default (no interface specified).

-E<Windows Handle>	Redirect the NodeLoad output string to another Windows application. The application uses the **WM_COPYDATA** message to send the output string to another application. The receiving application can then access the output string from the **COPYDATASTRUCT** structure sent by the NodeLoad application. See the WM_COPYDATA documentation at <u>msdn.microsoft.com</u> for more information.
-F	Fast download of communications parameters accomplished by skipping the final reset at the end of the download. Changes to the communications parameters will take effect on the next power cycle or reset. This option applies to transceiver-parameter-only programming (`-X` without `-L`). This option is also mutually exclusive with the `-M` argument.
-H	Hold the current configuration of the network interface. • If the device is currently configured, no changes are made. • If the device is currently unconfigured and domain index 0 is valid, the device will be configured. • If the device is unconfigured and domain index 0 is invalid, then the normal default configuration is used (zero length domain, random subnet ID, and node ID 126).

-K<key>	Specify the 6- or 12-byte authentication key to program into the device after downloading the application and transceiver parameters. The chip will be authenticated after the key is programmed.
	
	    `-K474D52445746`
	    `-K4B4953534D59475249545321`

-L<file>	Download application found in `<file>` in Intel Hex format. This file has the NDL file extension. `-Lmyapp.ndl`
-M	Specify a MIP image download, such as a ShortStack Micro Server image. This option is used for downloads of applications that become non-responsive at the end of the load, such as a ShortStack Micro Server. Such applications go into a "quiet mode" after the application starts but before it is fully initialized by the host processor. Thus, if you do not specify the `-M` argument, NodeLoad will report a failure at the end of the load process, even though the load is likely to have succeeded. This option is mutually exclusive with the `-F` argument.
-N	Specify the unique ID or Neuron ID of the chip to program. The unique ID or Neuron ID should be specified as 12 hex digits. For example: `-N05000A1CE900`

Argument	Description
`-O<file>`	Redirect the NodeLoad output string to the file specified. **-O**_filename.txt_
`-Q`	Send a query for unconfigured devices on the network and program the first device found. This argument is the default if none of `-N`, `-W`, and `-Q` are specified. _Note: This method is not recommended when building power line-based devices unless the NodeLoad station has a good power line communications isolator._

`-U<key>`	Specify the 6- or 12-byte authentication key used to unlock a previously authenticated device.
	
	`-U474D52445746`
	`-U4B4953534D59475249545321`

`-V`	Set to verbose mode.
`-W<secs>`	Wait for a service pin message before downloading. If no service pin message is received within the specified time, NodeLoad exits. For example, to wait 5 seconds for a service pin message, use the following command: `-W5`
`-X[<file>]`	Update transceiver parameters using those found in the file specified in `-L<file>` above or in the `-X<file>` if the optional `<file>` argument is specified. `-Xmyapp.ndl` _Note: If `-L<file>` is not specified, then the `<file>` argument becomes required for the `-X` option._

`-Z<value>`	Specify 0-, 1-, 3-, or 6-byte domain ID. Leave the argument empty for the zero-length domain.
	
	`-Z` -> zero-length domain
	`-Z14`
	`-Z020812`
	`-Z140923100523`

`-#`	Force a larger buffer for faster downloads. NodeLoad will ignore this option if it is not safe.
`-!`	Bypasses the transceiver-compatibility check of the image to be downloaded. Normally, NodeLoad checks that the image file is compatible with the transceiver before it loads the image. _Note: Do not use this option if you have any doubt about the transceiver-compatibility of your image file. An incompatible image can damage a transceiver._

Example NodeLoad Commands

Here are five examples that use the NodeLoad commands.

1. This example command opens LON1, finds a device, downloads an application named "test", and sets the transceiver parameters:

    ```
    nodeload –Ltest.ndl –Xtest.ndl
    ```

2. This example command opens LON2, waits 3 seconds for a service pin message, and downloads the transceiver parameters.

    ```
    nodeload –DLON2 –W3 –Xtest.ndl
    ```

3. This example command opens LON1, waits 10 seconds for a service pin message, and downloads an application named "test" from a directory named "C:\myApplication".

    ```
    nodeload –DLON1 –W10 –L"C:\myApplication\test.ndl"
    ```

4. This example command opens LON1, specifies the Neuron ID of the node to load, and downloads only the application.

    ```
    nodeload –N050012AC1D00 –Ltest.ndl
    ```

5. This example command opens LON1, waits 20 seconds for a service pin message, specifies a ShortStack Micro Server image, and specifies the image name.

    ```
    nodeload –Dlon1 –W20 –M –Lss210_ft3120e4_20000khz.ndl
    ```

Result Strings and Codes

When NodeLoad completes, it returns a result string by the calling application to determine success or failure.

Errors that typically occur during setup, such as invalid network interface, invalid file format, invalid arguments, and so on, will be printed before the final "Nodeload Result" message in order to aid in debugging during setup. The Nodeload Result message is formatted to make parsing relatively easy for calling an application on the production assembly line.

Passing Result

This result message indicates passing results and returns the NID of the loaded node.

```
Nodeload Result: Success; NID=050001020300
```

Failing Result

This result message indicates failing results and includes a code that specifies the failure.

```
Nodeload Result: Failed (error - #x)
```

Error Code Reference

Error codes for the NodeLoad utility (`error - #x`) are defined in the following table.

Error Code	Error Title	Description
1	No nodes found	The "`-Q`" switch was specified and no devices were found during the query.
2	Service pin timeout	The "`-W`" switch was specified and no service pin message was received.
3	Comm failure	A communication failure occurred either on initial contact with the "`-N`" switch or subsequent contact in any mode.
4	File error	The NDL file was not found or was corrupted.
5	Reset failure	Nodeload could not successfully cause the node to reset. This could indicate an excessively long reset clause in the application.
6	Buffer failure	Nodeload could not successfully configure the buffers on the network interface.
7	State failure	The device could not be successfully put into the correct state at the end of the load.
8	Checksum failure	The device failed to set its checksum after the load.
9	Version mismatch	The device firmware version didn't match the firmware version that the NDL file was linked for.
10	Model mismatch	The device model number (that is, part type) did not match the model number that the NDL file was linked for.
11	Interface error	The network interface (for example, U10) could not be communicated with.
12	Response error	The device reported a failing response. This could be due to an authentication key mismatch or a failure to write non-volatile memory.