NLUTIL MANUAL

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SUMMARY

INTRODUCTION

Thank you for choosing **NLUtil** software member of NLSuite.

We are happy to help you in your LonWorks integration job. All softwares of NLSuite are often updated for correcting bugs and improve performances. We propose to you to check version on Web site www.newron-system.com.

NL220

Generic LonWorks LNS Manager tools.

NLFacilities

It is graphical tool for managing your living spaces.

NLOPC-MIP

A very fast OPC server with embedded tool for tuning your Scada.

NLOPC-VNI

A LNS OPC server. It can manage directly iLon interfaces.

NLUtil

Window node utility. It is used before installation for checking channel and other LonWorks products.

INSTALLATION OF PROGRAM

This section explains how to install the NLUtil program

Configuration requirements

The table below shows the minimum configuration and the recommended configuration for the installation and correct functioning of the program.

Equipment	Minimum	Recommended
Operating system	Windows 95, 98, Me,NT, 2000, Xp	Windows NT, 2000, Xp
Computer	Pentium III 350 Mhz, 800 x 600 screen	Pentium III 750 Mhz, 1024 x 768 screen
Memory	64 M octets	128 M octets
Hard disk	5 Mo	5 M octets
CD ROM	Required for installation	Required for installation
Interface network	Type MIP or NSI card	Type MIP or NSI card

Table 1 The equipment

Installation

A setup program will guide you through the installation procedure and will ask you for any information necessary.

Just insert the CDROM in the CD reader.

You have the choice between the following installations:

Installation	*Details*
Complete	Complete installation of NLUtil and SNVT Master List.
Custom	You can choose the module to be installed

Table 2 Type of installation

You should restart your PC at the end of the installation, according to the instructions

NETWORK INTERFACE

The network interface allows a physical link to be created between the PC and LonWorks network.

Valid interfaces

Type of interface	Maker	Connection	MIP	NSI
PCC10	Echelon	Slot PCMCIA	X	X
PCLTA21	Echelon	Slot PCI	X	X
iLon100	Echelon	xDriver RNI	X	X
NIC USB	Loytec	USB driver	X*	X
NIC PCI	Loytec	Slot PCI	X*	X
NIC IP	Loytec	IP driver	X*	X

Table 3 Type of PC interface

* On require

To work, NLUtil needs a Firmware MIP or NSI interface

Driver for interface

Just install the Windows driver of the PC interface card.

Contents

Knowledge's

For an optimal use of NLUTIL, it is recommended to have the following knowledge's:

- Notions of LonWorks network.
- LonTalk protocol notions.
- Neuron Chip EEPROM table knowledge.

This utility can be used in a lot of cases and configurations.

It can be used from a little network to a very big network.

It can be used from a simple way to a very advanced expert mode.

A note about messages generated by NLUtil:

☞ All messages sent by NLUtil use NeuronId addressing.

The only time you can send a message with another addressing is using the Send messages option.

Basis

1) First you must create a site.

You can create a new site, open an existing one or finally import a LNS database.

All these options are found in the File menu.

In all case you have to select the network driver used. NLUtil cannot work without a network interface. NLUtil will display all available drivers on your machine. Select one and continue.

2) You can work with your local interface.

Select one option in the Local interface menu.

3) You must now add nodes into your database.

You can:

- Create a database from a LNS expor
- Scan the network to found nodes and routers on the network.
- Press the service pin of any node.
  The node is automatically added into your database
- Manually add a node from its NeuronID: Select option Add a node in the Network menu.

To display nodes and routers NLUtil have several views and filters.

4) You can now work individually on any node or router.

You can:

Select a device in the left tree and choose a tab for specific investigation.

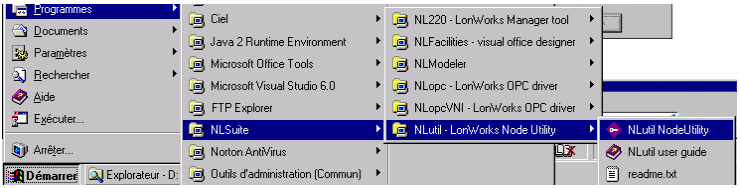
5) Now you can to work on several selected nodes in one operation. See Working with selection topic.

6) Finally do not forget to save your site before exiting (option Save the site in the File menu)

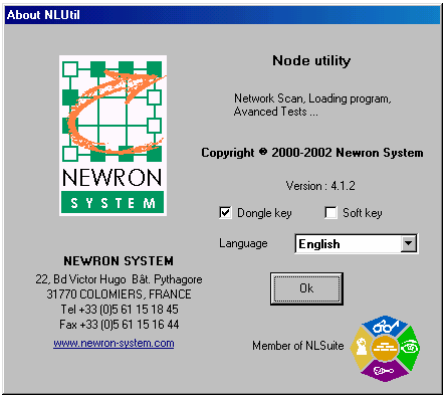
For more information about all options in menu see the General menu section.

STARTING NLUTIL

Start

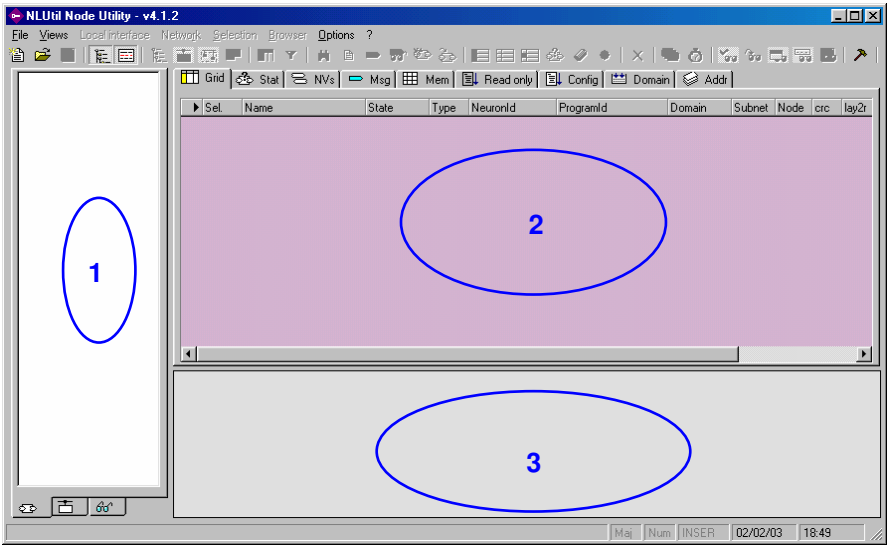


When you launch NLUTIL, you can choose the language:



English, French or German

Then you see the main screen view:



NLUtil show you different views and tabs in the main windows.

1 Tree view for nodes, routers or device template according bottom tabs selected.

2 Grid for nodes and detail edit window according upper tabs selected.

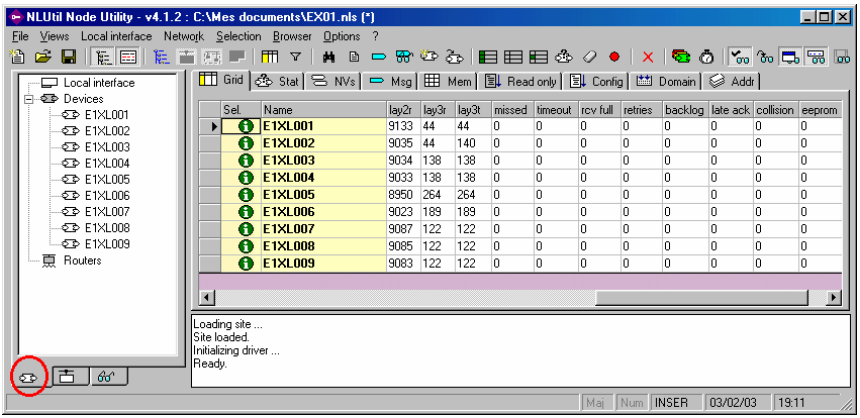
3 Trace view.

You are now ready to use the entire NLUTIL features

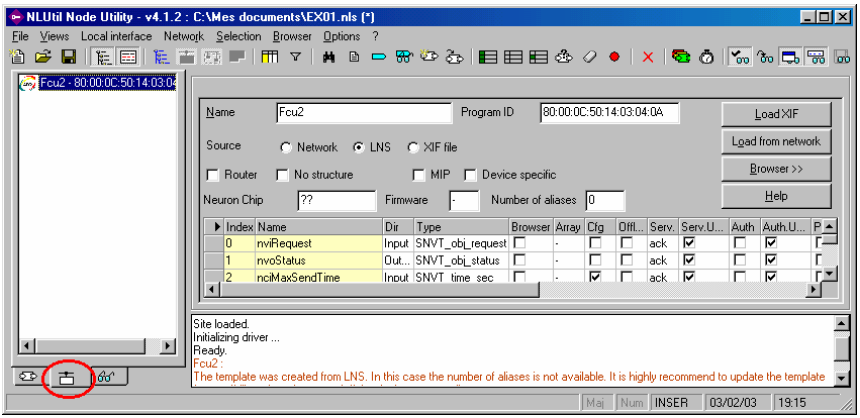
Tree view options

With tab in bottom of tree view, you can change the edit view:

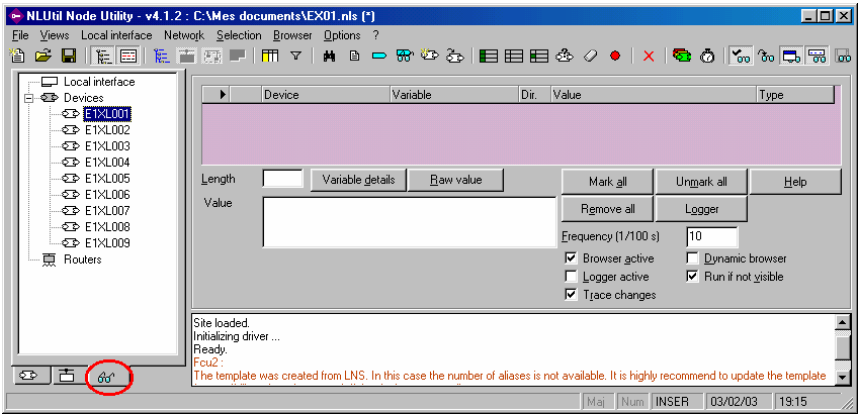
List of devices select is show following picture. In this view you can consult information about network interface, devices or routers with selection on specific tabs above edit view.



Device template is show following picture. In this



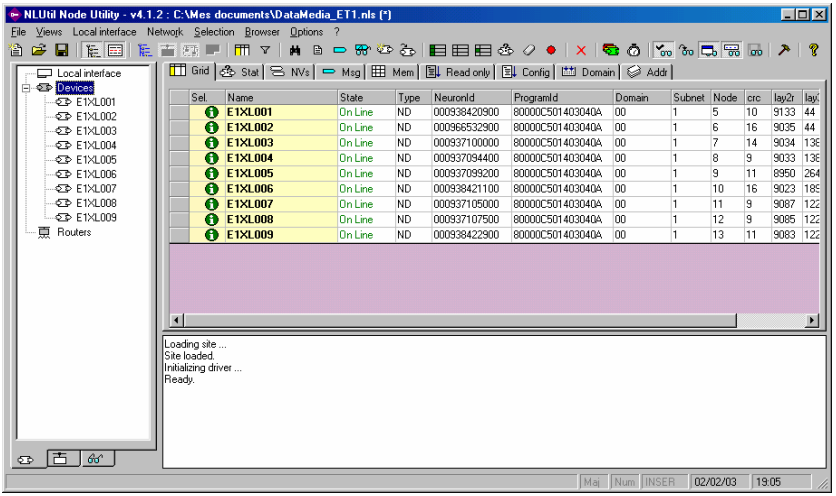
Browser is show following picture.



Views

Grid tab

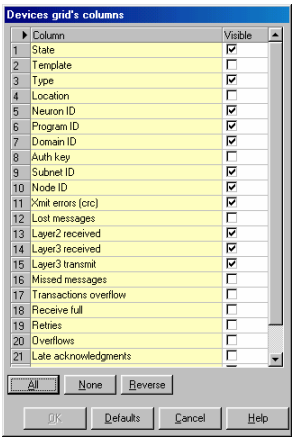
This view shows you information about nodes and routers.



You can change the sort of any column by left clicking on a column header.

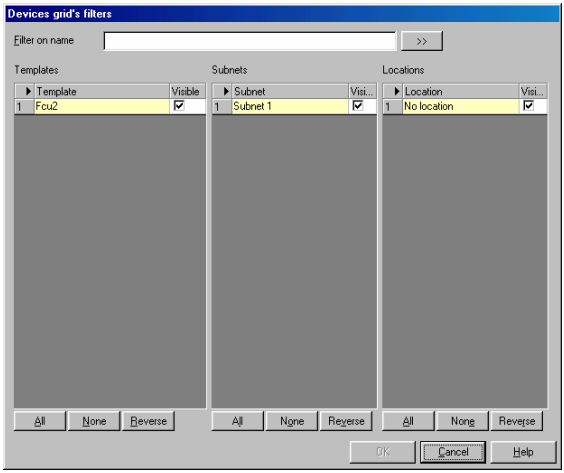
Several click on same column header change the sort direction.

All columns in this view are selected by “device’s grid columns”  option.



Each row selected is displayed in the grid view.

The nodes displayed in grid depend on the filter you set.



Fixed columns in grid are:

Sel. .....X if the node is selected, empty if not selected.

Name .....Name of the node

Optional columns are:

State .....State of the device. If undefined then the state is ???.

Template .....Device template linked with the node.

Type .....Type of the device:
ND Node
RTN Router near
RTF Router far

Loc .....String location of the device.

NeuronId .....Neuron id of the device

ProgramId .....Program id of the device

Domain .....First domain value of the device

Auth. .....Authentication key for first domain.

Subnet .....Subnet id of the device

Node .....Node id of the device

err .....Number of CRC detected during packet reception.

lost .....Number of messages discarded because there was no application buffer available.
If an incoming message is too big for the application buffer the last error log is changed but the lost messages counter is not incremented.

lay2r .....Number of layer 2 messages received.
Layer 2 messages are correct CRC messages addressed to ANY node

lay3r .....Number of layer 3 messages received.
Layer 3 messages are correct CRC messages addressed to THIS node

lay3t .....Number of messages transmitted from layer 3 of the Neuron Chip.
Includes network variable updates, explicit messages, acknowledgements, retries, reminders, service pin and ny other type of messages.

missed .....Number of messages discarded because there was no network buffer available.
If an incoming message is too big for the network buffer this counter is increment.

timeout .....Number of times the node failed to receive acknowledge or response after retrying the configured number of times.

rcv full .....Number of times an incoming packet was discarded because there was no room in the transaction database.
This may be due to excessively long receive timers.

retries .....Number of retries sent by this node. Do not include the repeats for unacknowledged repeat messages.

backlog .....Number of time the backlog reaches its maximum value of 63.

late ack ..... Number of acknowledge received after the transmit transaction had expired.

collision ..... Number of occurrences of collision detection or collision resolution (if enabled).

eeprom ..... State of EEPROM lock. If one then the checksummed EEPROM on the node is protected against memory write.

Menus

General menu

The menu contains:

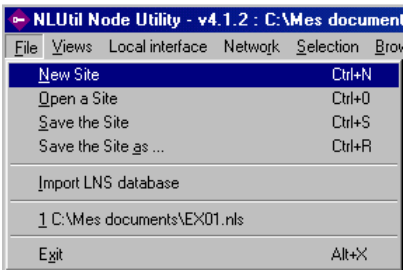
- File — Managing site file.
- Views — Options on display views
- Local interface — Managing LonWorks interface
- Network — Manage and configure actions on network
- Selection — Actions on grid for devices
- Browser — Options on browser view
- Options — Language, Warning configuration and catalogue
- ? — Help

The popup menus are available in tree view:

- Local interface menu
- Devices popup menu
- Router popup menu

File Menu

This menu contains special options to work on site.



New site.....Create new file of a site.

Open site .....Open a file of NLUtil version 4.

Save the site.....Save site on predefined file.

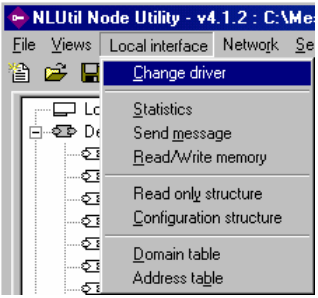
Save the site as .....Save site on new file.

Import LNS database ..... Open LNS database and get node name, device template and address of device and router installed.

Exit ..... Close site and exit from NLUtil

Local interface menu

This menu contains special options and command to work on network interface.



Change driver ..... Open a new interface for this site.

Statistic..... Show statistic about the current network interface.

Send message..... Send an explicit message to network interface.

Read/Write memory..... Read or write memory on network interface.

Read only structure..... Read structure named read only structure on network interface.

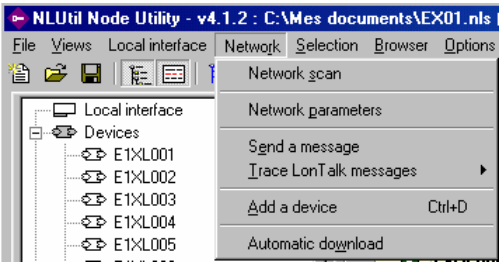
Configuration structure.... Read configuration structure on network interface.

Domain table ..... Read domain table on network interface.

Address table..... Read address table on network interface.

Network menu

This menu contains special options to work on network.

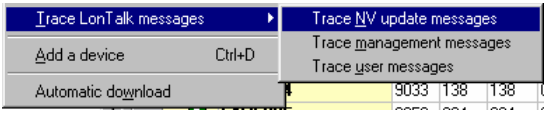


Networks scan .....Scan the network for new nodes
All new found nodes will be added into the grid and tree.

Network parameters.....Change network communication timers.

Send a message .....Send explicit messages with explicit addressing.

Trace Lontalk messages .Sub menu for setting options about trace specific message

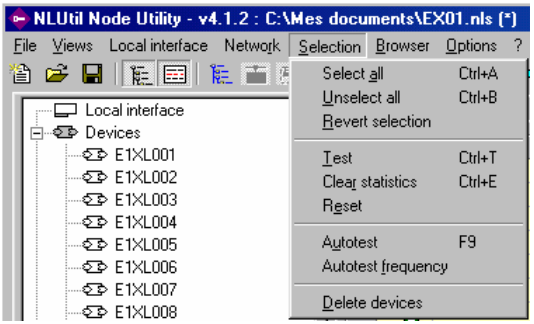


Add a device.....Manually add a node from its NeuronId.

Automatic download.....Download several nodes in one operation.

Menu Selection

This menu contains all options to work with selected item.



Select all.....Select all nodes displayed in list

Unselect all .....Unselect all nodes displayed in list

Revert selection .....Revert selection for the nodes displayed in list

Test .....Test all displayed selected nodes.

Clear statistics .....Clear statistics of all displayed selected nodes.

Reset.....Reset all displayed selected nodes.

Autotest .....Launch the autotest.

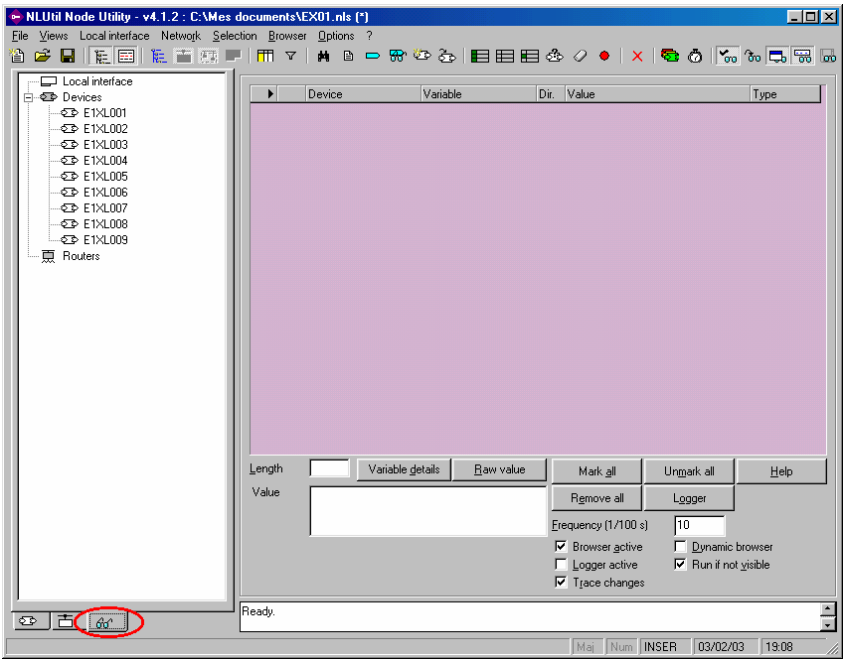
Autotest frequency.....Change the autotest frequency.

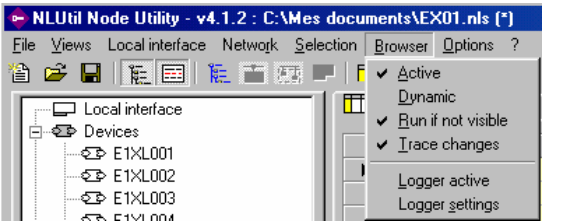
Delete devices .....Delete all displayed selected devices from database.

Browser menu

This menu contains all options to work with browser.

The browser is show when you select the browser tab in tree view.

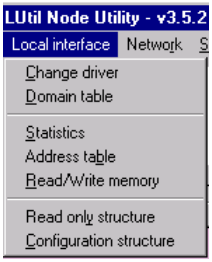



NLUtil Node Utility - v4.1.2 : C:\Mes documents\EX01.nls (*)
File Views Local interface Network Selection Browser Options ?
Active
Dynamic
Run if not visible
Trace changes
Logger active
Logger settings
Local interface
Devices
E1XL001
E1XL002
E1XL003

Active.....

Menu Local interface

This menu contains all options to handle the network local interface.



Change driver.....Change the used driver.

Domain table .....View/update domain table of the local interface.

Statistics.....Statistics of the local interface.

Address table.....View/update address table of the local interface.

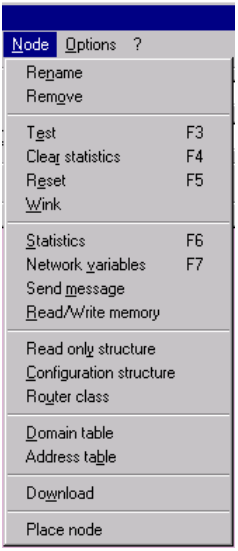
Read/write memory.....Read and write memory from and into the local interface.

Read only structure.....View/update read only structure of the local interface.

Configuration structure....view/update configuration structuref the local interface.

Menu Node

This menu contains all operations you can use on a node or router.



After selecting an option in the menu a window will open to select the node you want to operate.

All these operations can be accessed (popup menu) directly right clicking on a node or router in the list. In this case you will not have to select the node.

You have three different popup menus :

- Node popup menu
- Router popup menu
- Undefined node popup menu

Rename.....Change the name of a node.

Remove.....Remove a node from the database

Test .....Test a node and display results in list

Clear statistics .....Clear statistics of a node

Reset.....Reset a node

Wink .....Wink a node

Statistics.....Display statistics window of a node

Network variables .....Display network variables window of a node

Send messages.....Send explicit messages to a node

Read/write memory.....Read/write memory from/into a node

Read only structure.....View and update read only structure of a node

Configuration structure....View and update configuration structure of a node

Router class .....View and update class of a router

Domain table .....View and update domain table of node

Address table.....View and update address table of a node

Download .....Download an application into a node

Place node .....Place an undefined node

Node popup menu

This menu is displayed when right clicking on a node in the list.

There are three different popup menus:

- Node popup menu
- Router popup menu
- Undefined node popup menu

Rename.....Change the name of the node.

Remove.....Remove the node from the database

Test .....Test the node and display results in list

Clear statistics .....Clear statistics of the node

Reset.....Reset the node

Wink.....Wink the node

Statistics.....Display statistics window of the node

Network variables .....Display network variables window of the node

Send messages .....Send explicit messages to the node

Read/write memory.....Read/write memory from/into the node

Read only structure.....View and update read only structure of the node

Configuration structure....View and update configuration structure of the node

Domain table.....View and update domain table of the node

Address table.....View and update address table of the node

Download.....download an application into the node

Undefined node popup menu

This menu is displayed when right clicking on an undefined node in the list.

There are three different popup menus :

- Node popup menu
- Router popup menu
- Undefined node popup menu

Rename.....Change the name of the node.

Remove.....Remove the node from the database

Place node.....Place the node

Place all the nodes.....Place all undefined nodes

Router popup menu

This menu is displayed when right clicking on a router (near or far) in the list.

There are three different popup menus :

- Node popup menu
- Router popup menu
- Undefined node popup menu

Rename.....Change the name of the router.

Remove.....Remove the router from the database

Test .....Test the router and display results in list

Clear statistics .....Clear statistics of the router

Reset.....Reset the router

Statistics.....Display statistics window of the router

Read/write memory.....Read/write memory from/into the router

Router class .....View and update class of a router

Read only structure.....View and update read only structure of the router

Configuration structure....View and update configuration structure of the router

Domain table .....View and update domain table of the router

Address table.....View and update address table of the router

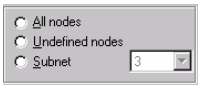
Router class .....View and update class of the router

Filters

NLUtil have several filters on the nodes to be displayed.

Filters the nodes on subnet

In the left upper part of the screen you can select the nodes to display.



All nodes .....Display all nodes

Undefined nodes .....Display undefined nodes

Subnet .....Display nodes belonging to one subnet. You can select the subnet you want.

Filtering nodes on name and programId

In the center upper part of the screen you can filter the nodes on name and/or program id.

Name filter .....Filter on name. You must click on OK to set the filter.

Can be :

*NAME.....Nodes with names that end with NAME.

NAME*.....Nodes with names that begins with NAME.

NAME .....Nodes with names that includes with NAME.

NAME.....Nodes with names equal to NAME

EMPTY.....No filter

PID filter .....Check this to filter the nodes on one programid. You can select the programID you want.

Options

You can view and change the option in the options screen.

To access this feature select the options menu.

The options are:

Langage .....Language of NLUtil.

SNVT catalog path .....SNVT master list path.

Pourcent. warning crc .....Percent of crc for warning bitmaps.
Nodes in the list with a percent of the number of crc (err) by the number of received messages (layer2r) will be displayed with a warning icon ().
For example if you set the percent as 5 then if number of crc / number of layer2 received is greater or equal to 0.05 then the node will be display with warning icon ().

☑ Cache network variables configuration .If checked NLUtil will cache the configuration of the network variables of each node.The network variables configuration will be loaded only one time when opening the network variables window. After the first time NLUtil will use the memorize data.

☐ Save network variables configuration in sites files
If checked NLUtil will save the memorized network variables configuration for each node in the site file (when saving).
This greatly increments the time to save and load a site file.

The commands are :

OK .....Save the options

Cancel .....Cancel and return

CREATE NLUTIL DATABASE

Introduction

1) First you must create a site.

You can create a new site, open an existing one or finally import a LNS database.
All these options are found in the File menu.

In all case you have to select the network driver used. NLUtil cannot work without a network interface. NLUtil will display all available drivers on your machine. Select one and continue.

2) You can work with your local interface.

Select one option in the Local interface menu.

3) You must now add nodes into your database.

You can:

- Create a database from a LNS export
- Scan the network to found nodes and routers on the network.
- Press the service pin of any node.
  The node is automatically added into your database
- Manually add a node from its NeuronID: Select option Add a node in the Network menu.

To display nodes and routers NLUtil have several views and filters

For more information about all options in menu see the General menu section.

Working with sites

A site is a place where a network is existing and commissioned

NLUtil works with sites.

You can make a new site or open an existing one.$

You can copy a site from a pc to another. A simple NLS file composes a site.

To create a new site, select the option “New site” in the File menu

To open a new site, select the option Open site in the File menu.

Select driver

You can access this feature when:

- Creating a new site (option New site in File menu)Opening a site (option Open site in File menu)Importing a LNS database (option Import LNS database in File menu)
- Selecting the option Change driver in the Local interface menu.

In this window you can select the driver used.

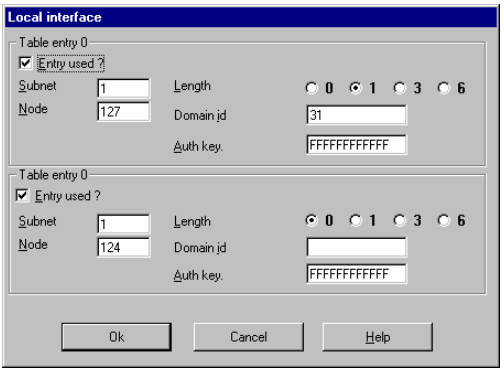
The list includes all available drivers on your machine.

The commands are:

OK .....Select and open the driver

Cancel .....Cancel and return

Then you parameter the network interface domain table



Network parameters

This feature enables you to change the timers of NLUtil.

To access this feature select the option Network parameters in the Network menu

The parameters are split in two groups.

The group Parameters are the parameters used to communicate with the nodes.

The group Scan parameters are the parameters used to make a network scan.

In the two groups the options are:

TxTimer .....Transmit timer in thousands of second.
The transmit timer is the time between two retries in acknowledge or request mode.

RptTimer .....Repeat timer in thousands of second.
The repeat timer is the time between two repeats in unacknowledged repeat mode.

Retry Count .....Number of retries (ack or request) or of repeats (unack repeat).

Plus one final option:

Non group timer interface .....Non-group timer in thousands of second.
The non group timer is the time the local interface keeps a transaction for unicast messages.

The commands are:

OK .....Save the parameters

Cancel .....Cancel and return

Scanning network

This is the first method to create a database: This allows you to scan a network and create a database from this scan.

To access this feature select the option networks scan in the Network menu

Please be sure you provided

- The correct domain Id for the PC interface card: NLUTIL will scan in this domain.
- The correct communication parameters and timers for the PC interface card. (You need to update these timers at the slowest media reference).

NLUTIL finds any node and router on the network and display them on the current windows one by one. At the end it tells the user how many nodes have been found.

Importing a LNS database

This is the second way to create a database.

This feature enables you to import a LNS database made with any LNS manager tool like NL220.

With this method you retrieve the node name of the LNS database.

To access this feature select the option Import LNS database in the File menu

4) First you must select the Project you want to import

Then click on Open.

The list Channels will be fill with all channels of the LNS database.

You must select the channel you want to import.

5) Select the channel in the left list and click on [>] to add the channel in the [Channels to import] list.

Click on [>>] to add all channels into the [Channels to import] list.

Select the channel in the right list and click on [<] to remove the channel from the [Channels to import] list.

Click on [<<] to remove all channels from the [Channels to import] list.

6) After selecting chanels you can:

[Import].....Import LNS database

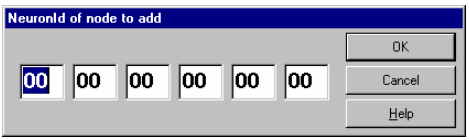
[Cancel].....Cancel and return

Adding a node

You can add any node in the windows by:

- Pressing the service PIN of the node
- Provide the Neuron Id of this node

To add a node providing Neuron Id select the option Add a node in the Network menu. This window enables you to manually add a node from its NeuronId.



You must enter here the NeuronId of the node you want to add.

NODES INFORMATION

Introduction

You have now nodes in the windows. To display nodes and routers remember that NLUtil have several views and filters

You can now work individually on any node or router.

You can :

Right click on the node in the list to open a popup menu.

There are three types of popup menus:

Node popup menu

Router popup menu

Undefined node popup menu

Select an option in the Node menu

☞ Important note : Please note that a network interface is a node on the network. So this chapter describes also local interface commands.

7) Now you can too work on several selected nodes in one operation.

See Working with selection topic.

8) Finally do not forget to save your site before exiting (option Save the site in the File menu)

For more information about all options in menu see the General menu section.

Select the node

Select the node for the operation you select. Click on its line

☞ Only the nodes affected by the operation are displayed.

For example for changing the router's class only the routers are available in the list.

Removing a node

This option removes the node from NLUTIL database

Renaming a node

This window enables you to rename a node.

To access this feature you can:

- Select the option Rename in the Nodes menu.
- Right click on a node and select the option Rename

Enter the new name of the node.

Undefined nodes are nodes added manually (option Add node in Network menu) that NLUtil cannot find on network when added.

☞ **This is useful when you want to add nodes offsite.**

When going on the site you must place the nodes with:

- Option Place all nodes in Network menu
- Option Place node in Node menu
- Right click on undefined node and select option Place node.

To display undefined node check the option 

.

Test

This option tests the node and update the column “State”

Clear statistics

This option clear the statistic of the internal EEPROM node

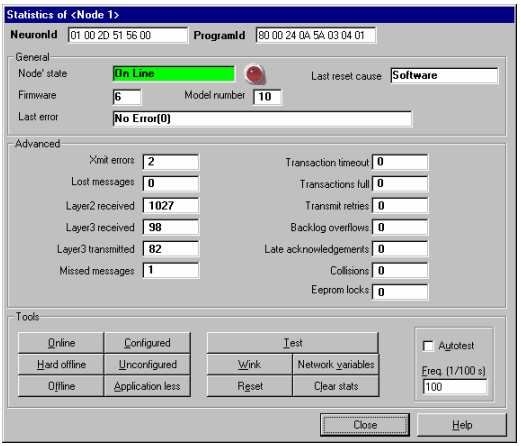
Reset

This option restet the node

Wink

This option send a wink command to the node

Statistics



This feature can be used to view statistics and manage the local interface or a node.

To access this feature you can :

- Select the option Statistics in the Local interface menu.
- Select the option Statistics in the Node menu.
- Right click on the node and select Statistics option.

The statistics are :

NeuronId .....Neuron id.

ProgramId .....Program id.

Node' state .....State of the node

Firmware .....Firmware version.

Model number .....Model number.

Last error .....Last error logged in eeprom.

Last reset cause .....Cause of the last reset.
Can be Power up, external, watchdog, software or cleared.

Xmit errors .....Number of CRC detected during packet reception.

Lost messages .....Number of messages discarded because there was no application buffer available.
If an incoming message is too big for the application buffer the last error log is changed but the lost messages counter is not incremented.

Layer2 received .....Number of layer 2 messages received.
Layer 2 messages are correct CRC messages addressed to ANY node

Layer3 received .....Number of layer 3 messages received.
Layer 3 messages are correct CRC messages addressed to THIS node

Layer3 transmitted .....Number of messages transmitted from layer 3 of the Neuron Chip.
Includes network variable updates, explicit messages, acknowledgements, retries, reminders, service pin and any other type of messages.

Missed messages .....Number of messages discarded because there was no network buffer available.
If incoming messages is too big for the network buffer this counter is increment.

Transaction timeout .....Number of times the node failed to receive acknowledge or response after retrying the configured number of times.

Transactions full .....Number of times an incoming packet was discarded because there was no room in the transaction database.
This may be due to excessively long receive timers.

Transmit retries .....Number of retries sent by this node. Do not include the repeats for unacknowledged repeat messages.

Backlog overflows .....Number of time the backlog reaches its maximum value of 63.

Late acknowledgements .....Number of acknowledge received after the transmit transaction had expired.

Collisions .....Number of occurrences of collision detection or collision resolution (if enabled).

Eeprom locks .....State of EEPROM lock. If one then the checksummed EEPROM on the node is protected against memory write.

Autotest

You can launch an autotest on the node. This will launch a normal test continuously and display dynamically the results on the screen.

Check the option ☐ Autotest.

You can change the frequency of the autotest in Freq. (1/100 s).

The commands are :

Test ....Test the node and display results on screen.

Online .....Put the node online.

Hard offline .....Put the node hard offline

Offline .....Put the node offline

Configured .....Put the node configured

.....Put the node unconfigured

.....Put the node application less

.....Wink the node

.....Reset the node

.....Show network variables of the node

.....Clear statistics

.....Close and return

Network variables

In this window you can read and write the network variables of a node.

To access this feature you can :

- Select the option Network variables in the Node menu.
- Right click on the node and select Network variables option.
- Click on the button Network variables in the Statistics windowof the node

The SNVT are formatted using the standard SNVT master list.

The path of the master list can be changed in the options screen.

The columns of the list are :

Mark .....Contains ➡ when NLUtil is polling the network variable, else nothing.
Marked network variables are automatic polled and refreshed on the screen.

Idx .....LonWorks index of the network variable (based 0).

Name .....Name of the network variable.
If the node doesn't keep the name of the network variable (pragma enable_sd_nv_names) then NLUtil will generate
automatic names.

Dir .....Direction of the variable.

Value .....Current value of the variable. If the variable is marked then the value is continuously refreshed. If an error occurs when polling the variable the value is **********.(star in red)

Type's name .....Type of the network variable. UNVT for user type.

Sel .....Selector.

Turn .....1 if the network variable is bound in turnaround that means bound with another network variable of the same node.

Serv .....Default service.

Auth .....Default authentication.

Addr .....Address index for bound nv. 15 if not bound.

Prior .....Default priority.

Poll .....1 if the network variable is a polled input network variable, 0 else.

Offline .....1 if the node must be offline to change the input network variable, 0 else.

CfgAuth .....1 if a manager tool can change the authentication of the network variable, 0 else.

Config .....1 if the network variable is a configuration network variable, 0 else.

CfgPrior .....1 if a manager tool can change the priority of the network variable, 0 else.

CfgSvc .....1 if a manager tool can change the service of the network variable, 0 else.

Sync .....1 if the network variable is synchronous, 0 else.

SNVTid .....SNVT id. Zero for user type.

Description .....Self documentation of the variable.

Marking/Unmarking network variables

You can mark/unmark variables for the automatic polling. Marked network variables will be continuously polled on the network. You can change the frequency of the polling in Polling frequency (1/100 s).

The marked variables appear in bold in the list.

The commands are :

A left click on anetwork variable will select the variable. The selected variable is preceed by ▶.

A left double clicked on a network variable marks/unmark the variable for automatic polling.

A right click on a network variable opens the details window of the network variable.

Variable details ..... Open the details window of the selected variable (equivalent to right click).
This button is disabled for UNVT.

Raw value details ..... Display the raw value window of the network variable.
If the type of the variable is a user type then the raw

Mark variable ..... Mark the selected variable for automatic polling.

Unmark variable ..... Unmark the selected variable for automatic polling.

Mark all ..... Mark all variables for automatic polling.

Unmark all ..... Unmark all variables for automatic polling.

Reload structure ..... Force NLUtil to reload network variables configuration.
Useful when using the network variables caching system (see options).

If the button blinks it means NLUtil have used the memorized configuration.

SNVT details

This window is used to read and write a network variable using the SNVT format.

For accessing this feature you have to open the network variables window and right click on a network variable.

The SNVT is decomposed on fields. These fields are displayed on the right list of the window.

When you select a field the properties of the field are displayed (min, max, scales, offset, length, ...).

These properties are displayed ONLY for information. You do not need to use them to change the value. NLUtil does all need conversions.

When you select each field you can view its value in the Value box.

For an input network variable you can change the value of each field.

The Raw value in the left lower part of the screen display the resulting raw value for the network variable.

The commands are :

Read .....Read the network variable on network and refresh the fields values.

Write .....Write the network variable on network (only for input network variable).

Close .....Close window and return.

RAW details

This window is used to read and write a network variable in raw format.

To access this feature you have to open the network variables window, select the variable and click on Raw value details.

The screen displays the value of a network variable in hexadecimal raw format.

The Raw value (hexa) contains one field for each byte of the network variable.

If the variable is an input network variable then you can change any of these bytes.

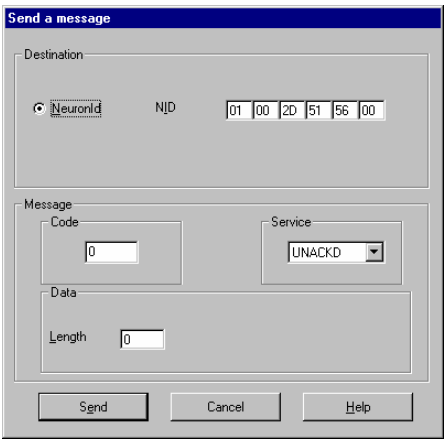
The commands are :

Read .....Read the network variable on network and refresh the bytes values.

Write .....Write the network variable on network (only for input network variable).

Close .....Close window and return.

Send a message



This window can be used to send explicit message using Neuron Id adressing to the selected node.

To access this feature you can :

- Select the option Send message in the Node menu.
- Right click on a node and select Send message option.

The options are :

NeuronId .....Send a unicast message using neuronid addressing
In this case you have :
NID Neuronid of the destination

Code .....Code of the message

Service .....Service of the message

Length .....Length of the data to send

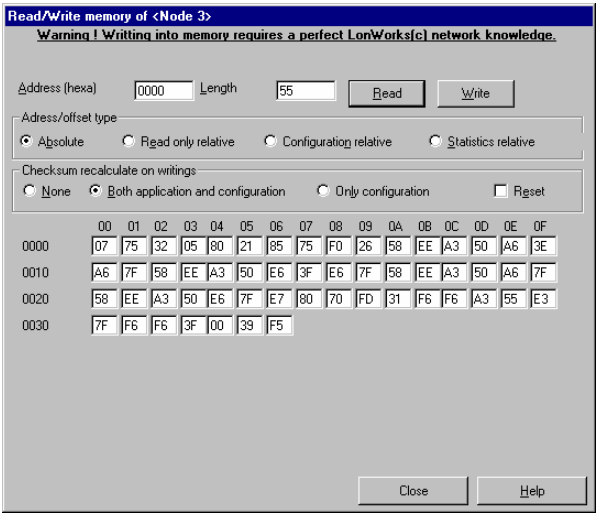
Data( ) .....Data. Use  to list all data bytes.

The commands are :

Send .....Send the message

Cancel .....Cancel and return

Read/write memory



This feature is useful to read and write memory of a node.

To access this feature you can :

- Select the option Read/Write memory in the Node menu.
- Right click on the node and select Read/Write memory option.

☞ **BEWARE**! Writing memory requires a perfect knowledge about LonWorks(c) network.

The options are :

Offset (hexa) ..... Offset of read/write operation relative to the type of addressing (see below).
If the type of addressing is Absolute then this is an absolute address and not an offset.

Adress/offset type ..... Type of addressing.

Absolute ..... The offset is an absolute address.

Read only relative ..... The offset is relative to the read/only structure

Configuration relative ..... The offset is relative to the configuration structure.

Statistics relative ..... The offset is relative to the statistics structure.

Checksum recalculate on writings ..... Type of checksum recalculate after a write.

None ..... Checksum are not recalculate after writes.

Both application and configuration ..... Application and configuration checksums are recalculated after writes.

Only configuration ..... Configuration checksum are recalculate after writes.

Reset ..... If checked the node is reset after write and checksum recalculate.

☞ **Note**: To be able to write memory you have first to read the memory bytes you want to write.

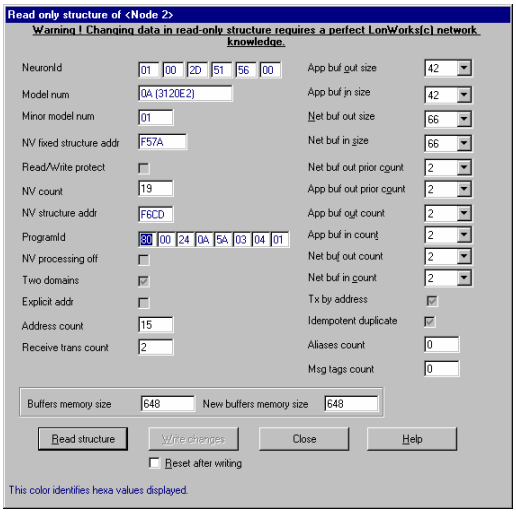
The commands are:

Read ..... Read memory

Write ..... Write memory

Close ..... Close and return

Read only structure



This feature can be used to view and change the read only structure of the local interface or a node.

To access this feature you can:

- Select the option Read only structure in the Node menu.
- Right click on the node and select Read only structure option.

Take attention! Changing data in read only structure requires a perfect knowledge about LonWorks(c) network.

The configuration structure fields are:

NeuronId .....Neuron id.
You cannot change this.

Model num .....Model of the Neuron Chip.
You cannot change this.

Minor model num .....Minor model of the Neuron Chip.
You cannot change this.

NV fixed structure addr .....pointer to the Network Variable fixed data table.
You cannot change this.

Read/Write protect .....If set (pragma read_write protect) then memory of the node cannot be read or written over network.Only read only structure, the SNVT structures, the configuration structure can be read and onlythe configuration structure can be written. You cannot change this.

NV count .....Number of network variable. Zero for host node based. You cannot change this.

NV structure addr .....Pointer to the SNVT data structure. Zero if the self information is not present(pragma disable snvt_si). FFFF for a host based node. You cannot change this.

ProgramId .....Program id.

NV processing off .....Set if the network variables processing is performed off chip in a host based node. You cannot change this.

Two domains .....Set if the node has two entries in the domain table.You cannot change this.

Explicit addr. .....Set if the node uses explicit message addressing.You cannot change this.

Address count .....Number of entries in the address table.You cannot change this.

Receive trans count .....Number of receive transactions. Each transaction uses 13 bytes RAM. You cannot change this.

App buf out size .....Size of application output buffers.

App buf in size .....Size of application input buffers

Net buf out size .....Size of network output buffers.

Net buf in size .....Size of network input buffers.

Net buf out prior count .....Number of network output priority buffers. Can be zero if the node do not send priority messages.

App buf out prior count .....Number of application output priority buffers. Can be zero if the node do not send priority messages.

App buf out count .....Number of application output buffers.

App buf in count .....Number of application input buffers.

Net buf out count .....Number of network output buffers.

Net buf in count .....Number of network input buffers.

Tx by address .....Set if the node maintains a separate outgoing transaction space for each unique destination address in the address table. You cannot change this.

Idempotent duplicate .....Set if the Neuron Chip sets the indepotent retry bit in the application buffer when a request retry is sent up by the application. You cannot change this.

Aliases count .....Number of aliases. You cannot change this.

Msg tags count .....Number of bindable message tags.You cannot change this.

Buffers memory size .....Memory size used by buffers before changes.

New buffers memory size .....Memory size used by buffers after changes. Be careful ! If the new buffers memory size is greater than the buffers memory size it may cause the node to disfunction.

The commands are :

Read structure .....Read the node's read only structure and refresh the screen.

Write changes .....Write the changes into the read only structure of the node. Checksum are correctly updated after writing.
If ☐ Reset after writing is checked then the NLUtil will reset the node after the write.

Close .....Close and return

Domain table

This feature enables you to change the domain table of the local interface or a node

For accessing this feature you can :

- Select the option Domain table in the Local interface menu.
- Select the option Domain table in the Node menu.
- Right click on the node and select Domain table option.

You can enter the properties how the two entries of the domain table.

Note : If the node has only one domain in the table then the second entry properties are not visible.

For each domain entry you have :

☑ Entry used ? .....Checked if the domain entry is used.

Subnet .....Subnet id of the node.

Node .....Node id of the node.

Length .....Length of the domain id (0,1,3 or 6).

Domain id .....Domain id in hexadecimal form.

Auth key. .....Authentication key.

The commands are :

OK .....Update the domain table of the node

Cancel .....Cancel and return

Configuration structure

This feature can be used to view and change the configuration structure of the local interface or a node.

For accessing this feature you can :

- Select the option Configuration structure in the Local interface menu.
- Select the option Configuration structure in the Node menu.
- Right click on the node and select Configuration structure option.

☞ BEWARE! Changing data in configuration structure requires a perfect knowledge about LonWorks(c) network.

The configuration structure fields are :

Channel Id .....Channel id. Not really used but can be useful when recovering a network.

Location .....Location id. Six bytes length in hexadecimal form.

Communication clock .....For direct mode transceivers specifies the ratio between Neuron Chip input clock oscillator frequency
and the transceiver bit rate. For special purpose mode transceivers specifies the rate of the bit clock between the Neuron Chip and the transceiver.
You cannot change this.

Input clock .....Oscillator frequency (input clock).
You cannot change this.

Communication type .....Type of transceiver.
You cannot change this.

Communication port pins Direction of the Neuron Chip's communications port pins.
You cannot change this.

Preamble length .....Length of the preamble for direct mode. Zero for special purpose mode transceivers.
The time formula is : [209..223)+(32) * value] cycles
Cycles=.6 microsecond for 10MHZ, 1.2 microsecond for 5 MHZ and so on.

Packet cycle .....Packet cycle duration for counting down the backlog.
Time formula for direct mode is : 1675 * value
Time formula for special purpose mode is : 1794 * value

Beta2 control .....Beta2 slot width.
Time formula is : 40 + 20 * value

Xmit interpacket .....Interpacket padding after transmitting.
Time formula is : (41 * value cycles) if values < 128
Time formula is : (145*(128-values) cycles) if values >= 128

Receive interpacket .....Interpacket padding after receiving.
Time formula is : (41 * value cycles) if values <

128
Time formula is : (145*(128-values) cycles) if values >= 128

Priority slots ..... Priority slot used by the node when sending priority messages.
Must not be greater than the number of priority slots on the channel.
If zero the node has no priority slot allocated.

Channel priorities ..... Number of priority slots on the channel. Max value is 127.

Collision detect ..... Specifies if the pin CP4 are used to monitor a collision on the network.

Synchronous bits ..... Number of logic on bits received that are to be interpreted as the bit sync indicating the start of a packet.

Filter ..... For differential mode transceivers specifies the setting of the receive glitch filter.

Hysteresis ..... For differential mode transceivers specifies the setting of the receive hysteresis filter.

Collision end packet ..... Controls how close to the end of a packet the collision detect signal is checked in a transmitting Neuron Chip.
It is set as a function of the bit rate and the input clock rate.

Collision detect tail ..... Specifies that collisions are to be detected at the end of the transmitted packet following the code violation.

Collision detect preamble ..... Specifies that collisions are to be detected during the preamble at the beginning of the transmitted packet.
When used the packed is cancelled if collision is detected during the preamble.

XCVR params ..... Five last transceiver specific parameters for special purpose mode transceiver.
The first two bytes are composed by the fields from Collision detect to Collision detect preamble.
You cannot change this.

Non group timer .....Time of a transaction for unicast or broadcast messages.

Authenticated .....If set the network management messages are to be authenticated.

Preemption timeout .....Maximum time the node will wait for a free buffer in preemption mode.
In preemption timeout the node will log the error and reset.

The commands are :

Read structure .....Read the node's configuration structure and refresh the screen.

Write changes .....Write the changes into the configuration structure of the node.
Checksum are correctly updated after writing.
If ☐ Reset after writing is checked then the NLUtil will reset the node after the write.

Close .....Close and return

Address table

This feature enables you to change the address table of the local interface or a node

For accessing this feature you can :

- Select the option Address table in the Local interface menu.
- Select the option Address table in the Node menu.
- Right click on the node and select Address table option.

If the node does not have any address then the window will automatically closed.

The window will display from one to 15 address entries depending of the number of entries declared on the node.

For each entry you have :

Type .....Type of the address. Can be :
- unbound no address
- Sb/Nd Subnet/Node
- Bcast Broadcast
- Group Group
- TrnArnd Turn around

Size .....Size of the group. Only for Group addressing.

Domain .....Domain index 0/1.

Member or node .....Member number for Group addressing.
Node id for Sb/Nd addressing.

Rpt timer .....Repeat timer. Time between two repeat in unacknowledged repeat messages.

Retries .....Number of retries (or repeat for unacknowledged repeat messages).

Rcv timer .....Receive timer for Group addressing. Time for complete transaction.

Tx timer .....Transmit timer. Time between two retries in acknowledge or request messages.

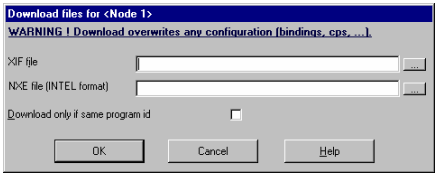
Group or subnet .....Group id for Group addressing.
Subnet id for Sb/Nd addressing.
Subnet id for Bcast addressing. 0 for domain broadcast.

The commands are :

Update .....Update the address table of the node

Close .....Close and return

Downloading a node



This feature can be used to download an application file into a node.

To access this feature you can :

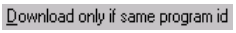
- Select the option Download in the Node menu.
- Right click on the node and select Download option.

Becareful! Downloading a node overwrites any configuration as the bindings, specials configurations (cps), ...

The options are:

XIF file .....Interface file used for downloading. Click on ... to select the file.

NXE file (INTEL format) .....Application file used for downloading. Click on ... to select the file.
Important note : The application file must be in INTEL format.



Check this if you want to download only if the programID is the same in the application file

The commands are:

Launch the download

Cancel and return

Changing the router class

This feature can be used to change the class of a router.

For accessing this feature you can:

- Select the option Router class in the Node menu
- Right click on the router and select Router class option.

The class available are :

..... Put the router in configured mode.
In this mode the router will forward messages depending on its forward tables (group and subnet)

..... Put the router in learning mode.
In this mode the router will reset its forwarding tables at reset and fill this table depending on the messages received.

..... Put the router in bridge mode.
In this mode the router will forward any messages from one side to the two domains of the other side.
This can be useful to spanning one or two domains.

..... Put the router in repeater mode.
In this mode the router will forward any messages.

The commands are :

.....Launch the download

.....Cancel and return

COMMANDS ON SELECTIONS

Introduction

You have nodes in the windows and you know how to handle them separately. This chapter deals with the commands applied to a selection of nodes

Now you can indeed work on several selected nodes in one operation.

You can select or unselect nodes in the view. Several operations can be launch on the selected nodes (menu Selection)

☞ ALL THE OPERATIONS ON SELECTED NODES WORK ONLY ON NODES PRESENT IN THE VIEW (NOT FILTERED).

You can have not displayed selected nodes (from example with a filtered name). These nodes are not concerned by selection operations.

Select All

Option Select all in selection menu

To select all node select the option Select all in the Selection menu.

Unselect All

Option Unsellect all in selection menu

To unselect all node select the option Unselect all in the Selection menu.

Reverse selection

Option Reverse in selection menu

To revert the selection, check the option Revert selection in the Selection menu. All selected node will be unselected. All unselected node will be selected.

Select / Unselect a node

To select or unselect a node, double click on the node in the list.

A selected node is preceded by an icon (column Sel.) in the list and is display in bold.

If not selected, the node is in not bold and no icon preceded it.

The icon may be :

 .....The state of the node is undefined. You must test the node at least one time.

 .....The node is configured online.

 .....The node is present but not configured online or the node have a great percent of crc (see).

 .....The node is absent.

If the icon is preceded by ➡ it means NLUtil is working on this node.

Test selected nodes

Option Test in selection menu

This option launches a test on all displayed selected nodes.

The results on the test are displayed in the list.

Clear statistics of selected nodes

Option Clear statistics in Selection menu

This option clears all stats of all displayed selected nodes and then tests the nodes.

The results on the test are displayed in the list.

Reset selected nodes

option Reset in Selection menu

This option reset all displayed selected nodes.

Autotest on selected nodes

Option Autotest in Selection menu

This option launches a continuous test on all displayed selected nodes.

The results of the tests are dynamically refreshed in the list.

You can change the frequency of the test with the option Autotest frequency in the Selection menu.

Autotest frequency

This feature is used to change the frequency for testing node in main window.

For accessing this feature select the option Autotest frequency in the Selection menu.

The unit of the frequency is one hundredth of second.

The commands are:

.....Change the frequency

.....Cancel and return

Delete selected nodes

Option Delete in Selection menu

This option deletes from database all displayed selected nodes.

Sending a message

This window can be used to send explicit message using unicast, groupcast or broadcast.

For accessing this feature you can :

- **Select** the option Send message in the Network menu.
- Select the option Send message in the Nodes menu.
- Right click on a node and select Send message option.

☞ If you use the option Send Messages on a node then you will only be able to send a message to the selected node using NeuronId addressing.

The options are :

Subnet/Node .....Send a unicast message using subnet/node addressing
In this case you have :
Subnet Destination subnet id
Node Destination node id

NeuronId .....Send a unicast message using neuronid addressing
In this case you have :
NID Neuronid of the destination

Group .....Send a message using group addressing
In this case you have :
GroupId Group id
Size Size of the group (0 for a huge group)

Broadcast .....Send a message using broadcast
In this case you have :
Subnet 0 for broadcast domain else subnet id for subnet broadcast

Code .....Code of the message

Service .....Service of the message

Length .....Length of the data to send

Data( ) .....Data. Use  to list all data bytes.

The commands are :

Send .....Send the message

Cancel .....Cancel and return

Automatic download

Automatic download can be used to download an application file to all nodes with the same programID.

To access this feature select the option Automatic download in the Network menu.

☞ Be careful ! Downloading a node overwrites any configuration as the bindings, specials configurations (cps), ...

The options are :

ProgramId of nodes to download .....Program id of the nodes to download

XIF file .....Interface file used for downloading. Click on ... to select the file.

NXE file (INTEL format) .....Application file used for downloading. Click on ... to select the file.
Important note : The application file must be in INTEL format.

Download only if same program id .....Check this if you want to download only if the programID is the same in the application file

Download only selected nodes .....Check this if you want to only download the selected nodes.

Download only nodes of one subnet .....Check this if you want to only download nodes of a specific subnet.
In this case you have to enter the subnet number.

Stop downloading on error .....Check this if you want to stop all downloads at the first error.
If unchecked NLUtil will continue to download other nodes after an error of a given node.

The commands are:

OK .....Launch the download

Cancel .....Cancel and return

TERMINOLOGY

NETWORK ADDRESS	LOGICAL ADDRESS OF THE NETWORK NODES (DOMAIN, SUBNET NODE) ASSIGNED WITH A LONWORKS INSTALLATION TOOL. A NODE WITH A LOGICAL ADDRESS IS CONFIGURED.
Configuration	EEPROM ADDRESS TABLE OF THE NEURON CHIP.
Binding	LOGICAL LINK BETWEEN NETWORK VARIABLES CREATED WITH A LONWORKS INSTALLATION TOOL.
Channel	A CHANNEL CORRESPONDS TO A NETWORK INTERFACE, WHICH LINK YOUR PC TO A LON NETWORK.
DLL	DYNAMIC LINK LIBRARY.
Driver	SYSTEM FILE DRIVING A PERIPHERAL.
Identifier	NULL TERMINATED STRING (1 TO 30 CHARACTERS), WHICH EXCLUSIVELY IDENTIFIES A GATE (VARIABLE OR MODULE).
Network Interface	PERIPHERAL WHICH INTERFACES THE PC TO A **LONWORKS** NETWORK. COULD BE A SLTA, A PCLTA OR A PCNSS.
Library	LIBRARY OF FUNCTIONS USABLE BY AN APPLICATION. A LIBRARY COULD BE STATIC (.LIB) OR DYNAMIC (DLL).
Explicit Message	LONWORKS MESSAGE USING EXPLICITLY ADDRESSING SEND OR RECEIVED BY A NODE.
Node	HARDWARE OBJECT LINK TO THE NETWORK WITH A LOGICAL ADDRESS (DOMAIN, SUBNET, NODE).
Network Variable	VARIABLE OF A NODE ACCESSIBLE BY LONWORKS NETWORK MANAGEMENT MESSAGES (POLL, FETCH, UPDATE).

The different state of a node

Application less.....No application is loaded.
The application does not run.
The node is not configured.
The service LED is steadily on.

Unconfigured .....The node is not configured.
The application is loaded and runs.
The service LED flashes at one second rate.

Configured online.....Normal node state.
The node is configured.
The application is loaded and runs.
The service LED is steadily off.

Configured hard offline....The node is configured.
The application is loaded but does not run.
The service LED is steadily off.

Configured soft offline.....The node is configured.
The application is loaded but does not run.
The service LED is steadily off.