Instruction

PC Installer Tool Application User Guide

Document No.:	INS10241
Version:	7
Description:	This document describes how to use the PC based Installer Tool application.
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Date:	2013-05-31
Reviewed By:	JKA;CHL
Restrictions:	Partners Only

Approved by:

Date	CET	Initials	Name	Justification
2013-05-31	12:04:20	NTJ	Niels Thybo Johansen	

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REVISION RECORD

Doc. Rev	Date	By	Pages affected	Brief description of changes
1	20050406	JFR	All	Minor changes
2	20060105	MVO	All	New 1st page/header/footer contents. New Doc No
3	20090401	DDA	All	Completely revised with respect to v2.12
4	20090811	DDA	All	Minor changes
5	20091207	DDA	All	Minor changes
6	20100118	DDA	Sections 4, 5.2, 5.3	Minor changes in functionality, screenshots updated.
7	20130514	MVO	All	Updated first two pages and headers/footers Removed reference to SDK CD

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1 ABBREVIATIONS

Abbreviation	Explanation
API	Application Programming Interface
DLL	Dynamic Link Library
RF	Radio Frequency
SC	Static Controller
SDK	Software Developer's Kit
SIS	SUC ID Server
SUC	Static Update Controller
TX	Transmitter

2 INTRODUCTION

2.1 What is Z-Wave Installer

Z-Wave Installer Tool is a Windows .NET application that shows how features of the Installer API can be used to implement tools, which can be of value for professional installers when setting up and testing more complicated Z-Wave Networks.

Z-Wave Installer Tool is based on the latest Z-Wave DLL.

2.2 Audience and prerequisites

The audience is Z-Wave partners and Zensys. It is assumed that the Z-Wave partner already is familiar with the current Z-Wave Developer's Kit.

3 GETTING STARTED

3.1 Check the prerequisites

The following components should be pre-installed on the machine that you need to run Z-Wave Installer Windows application:

1. .NET Framework, version 2.0 or later

2. Windows Installer 3.0 (Windows Installer 3.1 or later is recommended)

Important: Make sure you have the latest service pack and critical updates for the version of Windows that you are running. To find the recent security updates, visit Windows Update.

3.2 Required Z-Wave hardware

This application requires a Z-Wave module programmed with the embedded serial API Installer Tool application (Controller_Installer_ZW0x0x) and connected to the appropriate serial port.

Connect a Z-Wave module with the embedded serial API Installer Tool application to a COM port, before starting the PC application. The Installer Tool will automatically identify which COM port the Z-Wave module is using. If you have several Z-Wave modules with the embedded serial API Installer Tool in the network, it is recommended that you specify the COM ports for the Z-Wave modules as described in Section **5.1.**

3.3 Limitations

Z-Wave Installer Tool application is tested on Windows XP with Service Pack 2 (x86 platform) and requires the prerequisites listed above.

3.4 Install the Z-Wave Installer application

1. Exit all programs.

2. In Microsoft Windows, click the **Start** button, and then click **Control Panel**.

3. In Classic view, double-click **Add or Remove Programs.**

4. Click **Add New Programs**.

5. Click **Next** and then click **Browse** to locate the "**setup.exe**" in the "<drive name>\SDK\PC\Bin\ZWaveInstaller" folder.

6. Click **Finish** to start the installation. The welcome page appears as shown at the figure below. Please note the copyright notification and click **Next** button.

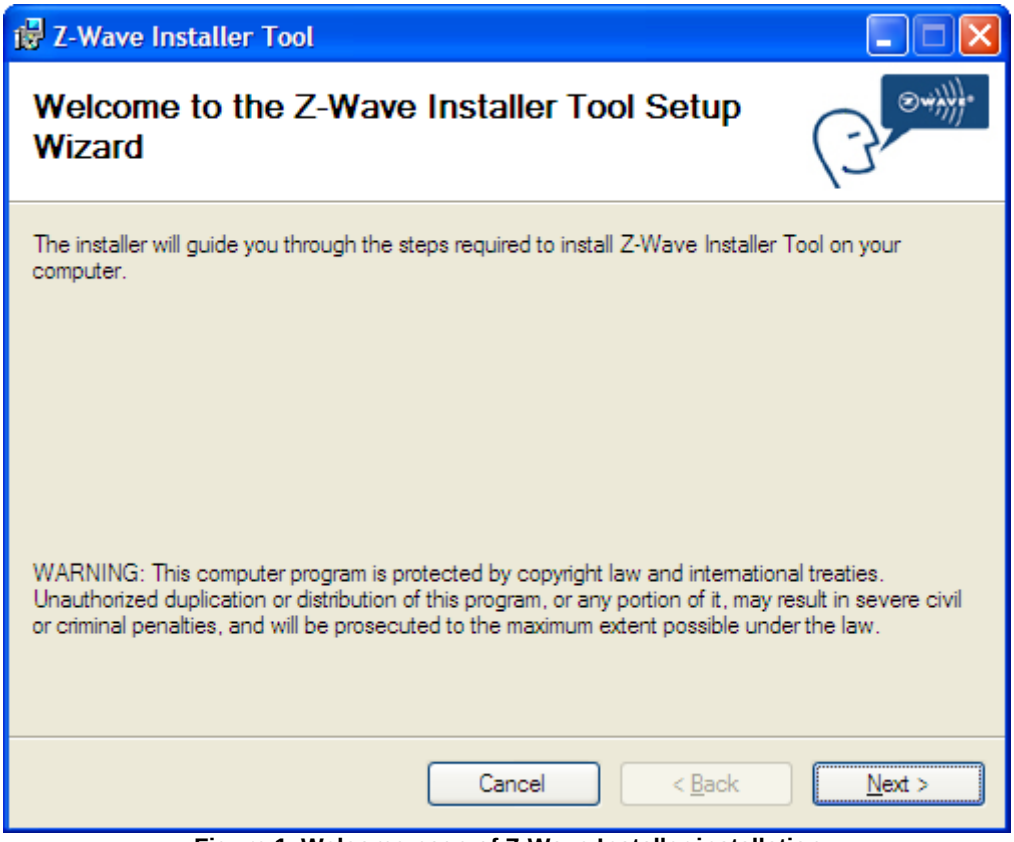

Figure 1. Welcome page of Z-Wave Installer installation

7. Select the installation folder and who should be able to use the Z-Wave Installer application. Please note, that it is not recommended to move the Z-Wave Installer application manually after it has been installed into the above specified folder.
   When done, click **Next**.

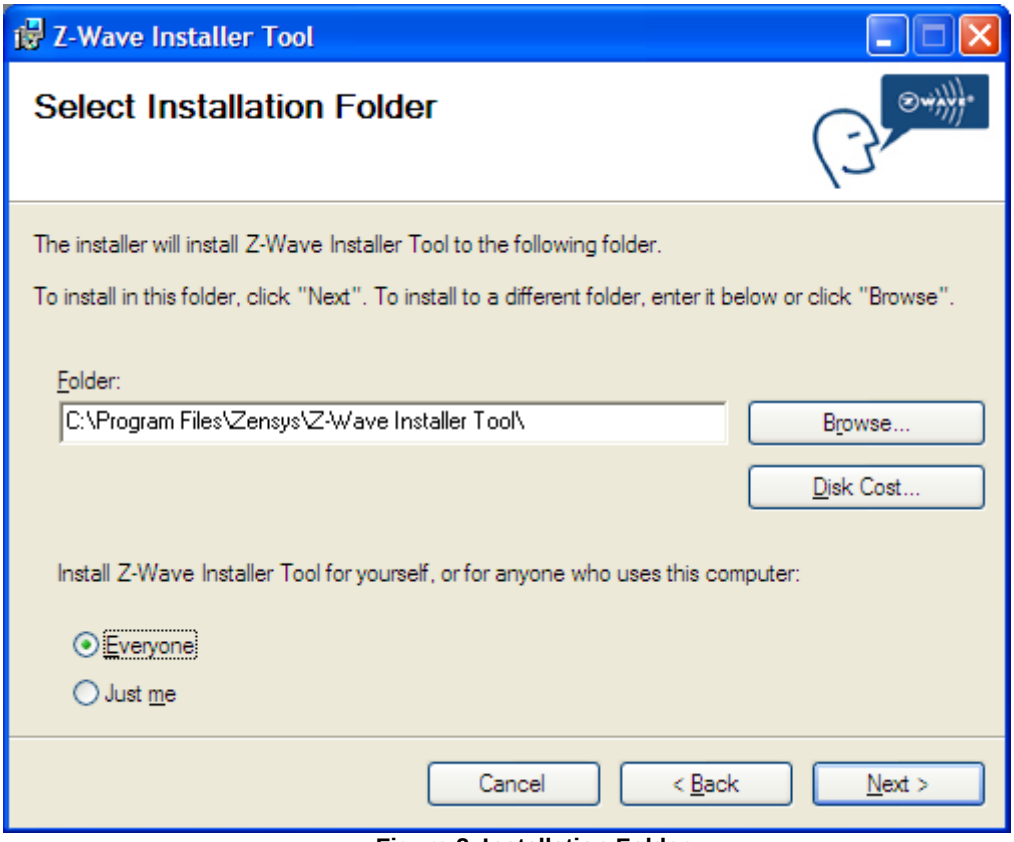

Figure 2. Installation Folder

8. Installation confirmation appears. Click **Next** again to confirm and start the installation.

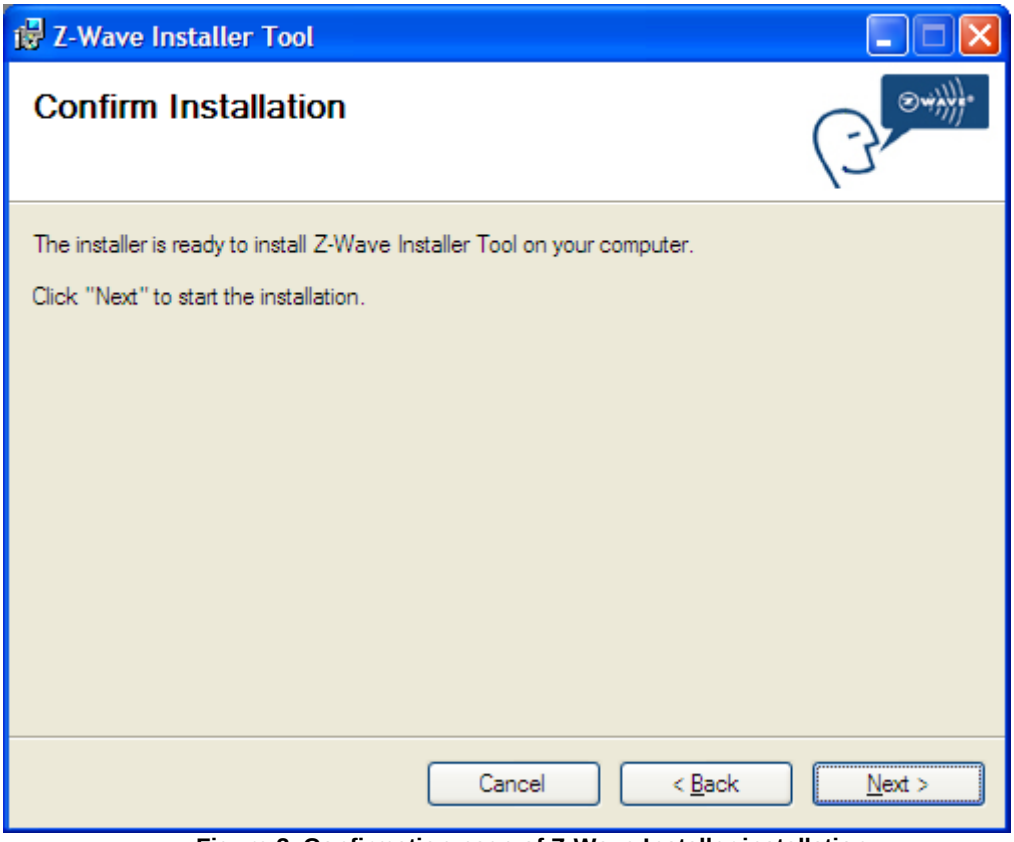

Figure 3. Confirmation page of Z-Wave Installer installation

9. The actual installation procedure will pass with progress indicator and final confirmation appears.
10. Click **Close** to complete the installation.

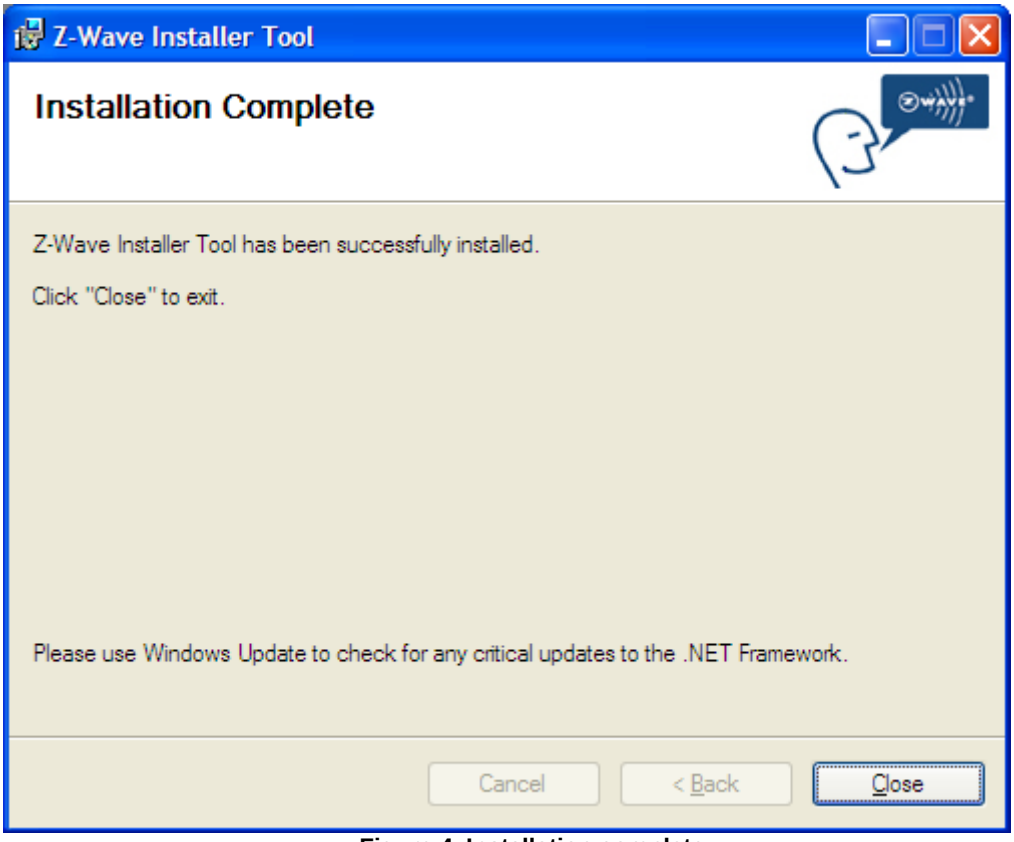

Figure 4. Installation complete

3.5 Start the Z-Wave Installer application

You can start the Z-Wave Installer using the Start menu. To open the Start menu, click the **Start** button in the lower-left corner of your screen. Or, press the **Windows logo** key on your keyboard. The Start menu appears.

To open Z-Wave Installer, click its icon shown in the left pane of the Start menu that displays the most frequently used programs list. If you don't see its icon there, click **All Programs** at the bottom of the left pane. Instantly, the left pane displays a long list of programs in alphabetical order, followed by a list of folders. Click **Zensys** folder, then click **Z-Wave Installer** folder and finally **Z-Wave Installer** icon.

3.6 Remove Z-Wave Installer

You can uninstall Z-Wave Installer from your computer if you no longer use it.

1. Open **Add or Remove Programs** in Control Panel.

   To do it, click **Start**, then click **Control Panel** (in Classical View – click **Start**, then point to **Settings**, and click **Control Panel)**, and then double-click **Add or Remove Programs**.

2. Click the program in the list and then click the **Remove** button. You can sort programs by selecting different options in **Sort by**.

3. Standard confirmation dialog appears. Click **Yes** to continue the removal of the Z-Wave Installer software.

4. Z-Wave Installer and its settings will be removed without prompting you further.

4 USER INTERFACE

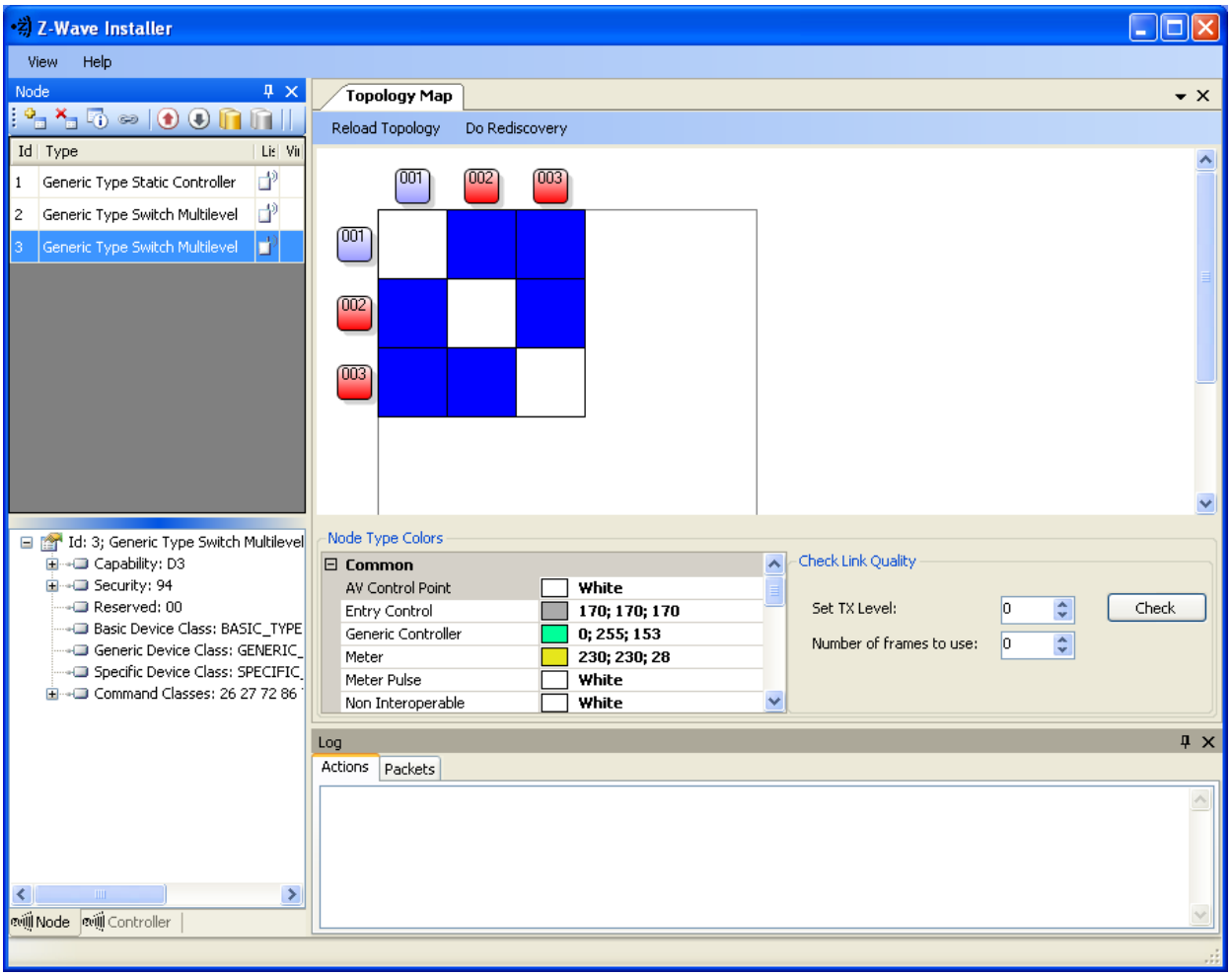

Figure 5. User interface

The Z-Wave Installer Tool application Main window consists of the following views:

- **Title bar**
- **Menu bar**
- **Node**
- **Controller**
- **Topology Map**
- **Log**

4.1 Main Menu

On top of the Main window is the Application **Main Menu**. It has the following items:

4.1.1 View Menu

Menu item	Description
Node	Toggle shows the Node section
Controller	Toggle shows the Controller section
Log	Toggle shows the Log section
Topology Map	Toggle shows the Topology Map section
Settings	To detect available serial ports and query them to find all connected Z-Wave devices
Exit	To exit the application.

4.1.2 Help menu

Z-Wave Installer comes with its own built-in Help system. The Help menu includes the items to access this Help system.

Menu item	Keyboard Shortcut	Description
Index		Browses Help system by keywords.
Contents	F1	Browses Help system by topics.
Search		Opens search tab of the Help system.
About…		Displays the version and short status information of the application

4.2 Node View

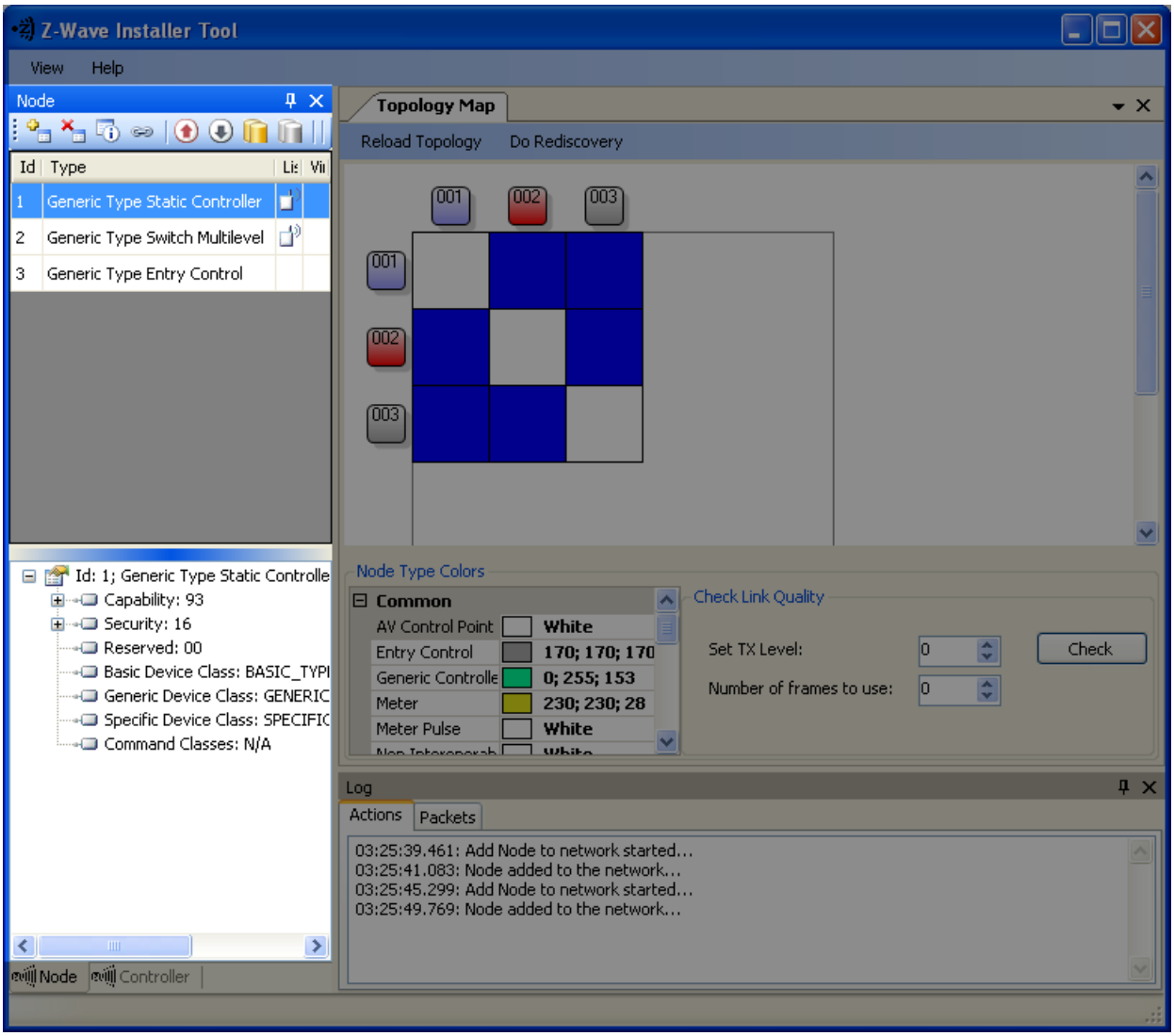

Figure 6. Node view

The **Node View** contains *Menu Bar, Node List* and *Node information* for the selected node.

It is used for operations with nodes.

The Node's ***Menu Bar*** has the following items:

Menu item	Description
Add	To Add a node
Remove	To Remove a node
Node Info	To request Node Info from a node
Reach Node	To send a NOP frame to a selected node
Basic Set On	To send a Basic Set On command to a selected node
Basic Set Off	To send a Basic Set Off command to a selected node
All On	To switch all nodes in the network ON
All Off	To switch all nodes in the network OFF

The ***Node List*** has three columns:

- **Node Id** – indicates the Node IDs of the units in the network;
- **Device Type** – describes the device types of the units in the Network;
- **Listening** – marks if a node is a listening-type.
- **Virtual** – indicates if a node is virtual.

The ***Node Info*** section is below the ***Node List*** and gives structured information about the selected node. For more information, please refer to Z-Wave Device Class Specification documentation.

4.3 Controller View

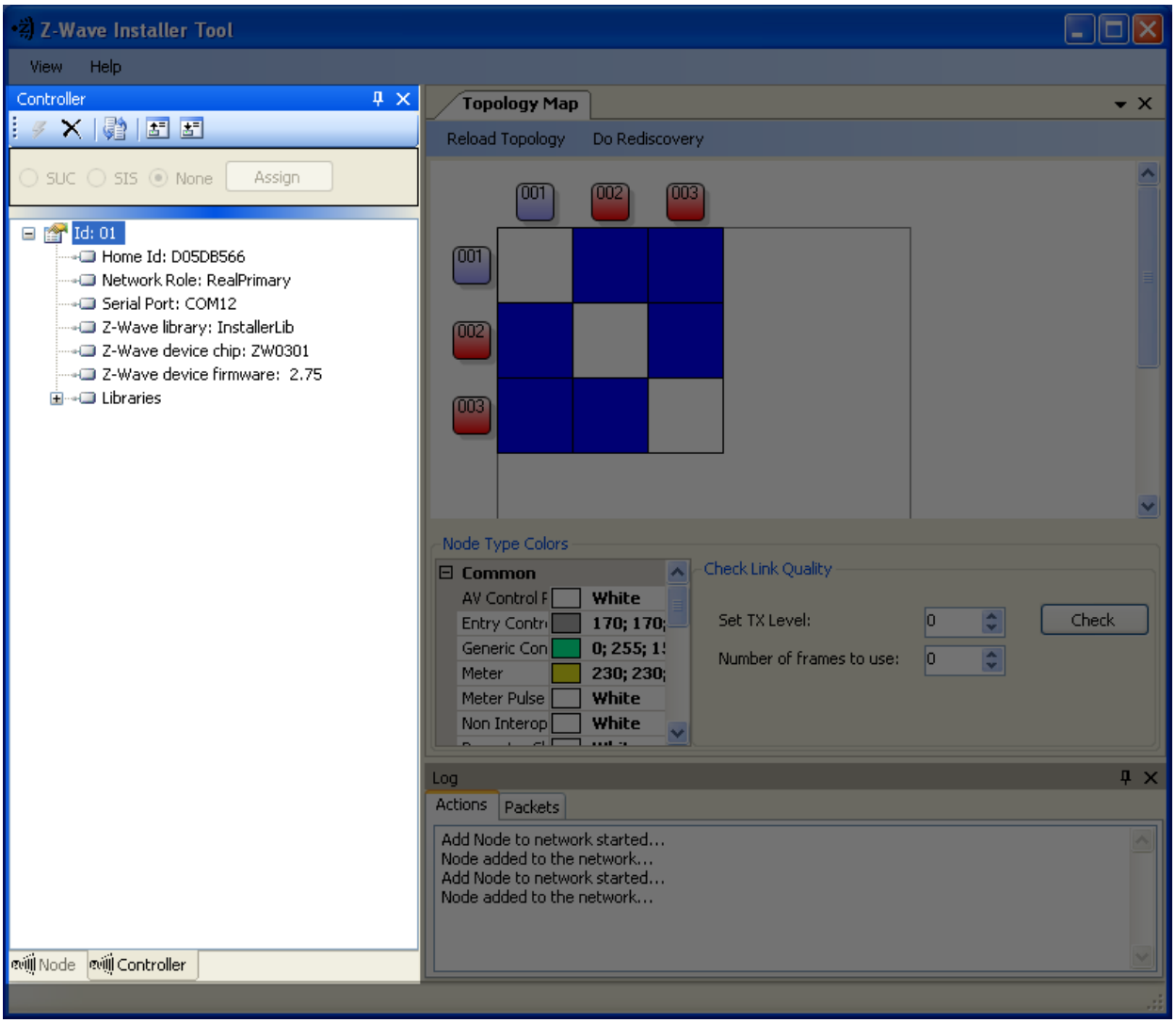

Figure 7. Controller view

The **Controller** view is shown on Figure 7. There are the following items in the main toolbar:

Menu item	Description
Start Learn Mode	Starts learn mode for the controller if it is needed to include it in another controller's network
Reset	Resets a controller
Shift	Is used to shift primary role to another controller in the network
Load Command Classes from device memory	To load command classes from the device memory (previously saved to device memory)
Save Command Classes to device memory	To save command classes from the PC Controller application memory to the Static Controller device memory

Beneath, there is a switch-type control for assigning Controller role options:

- SUC – to assign the SUC Network role to the controller;
- SIS – to assign the SIS Network role to the controller;
- None – to leave the Network role option clear;

and the **Controller Information** section.

4.4 Topology Map view

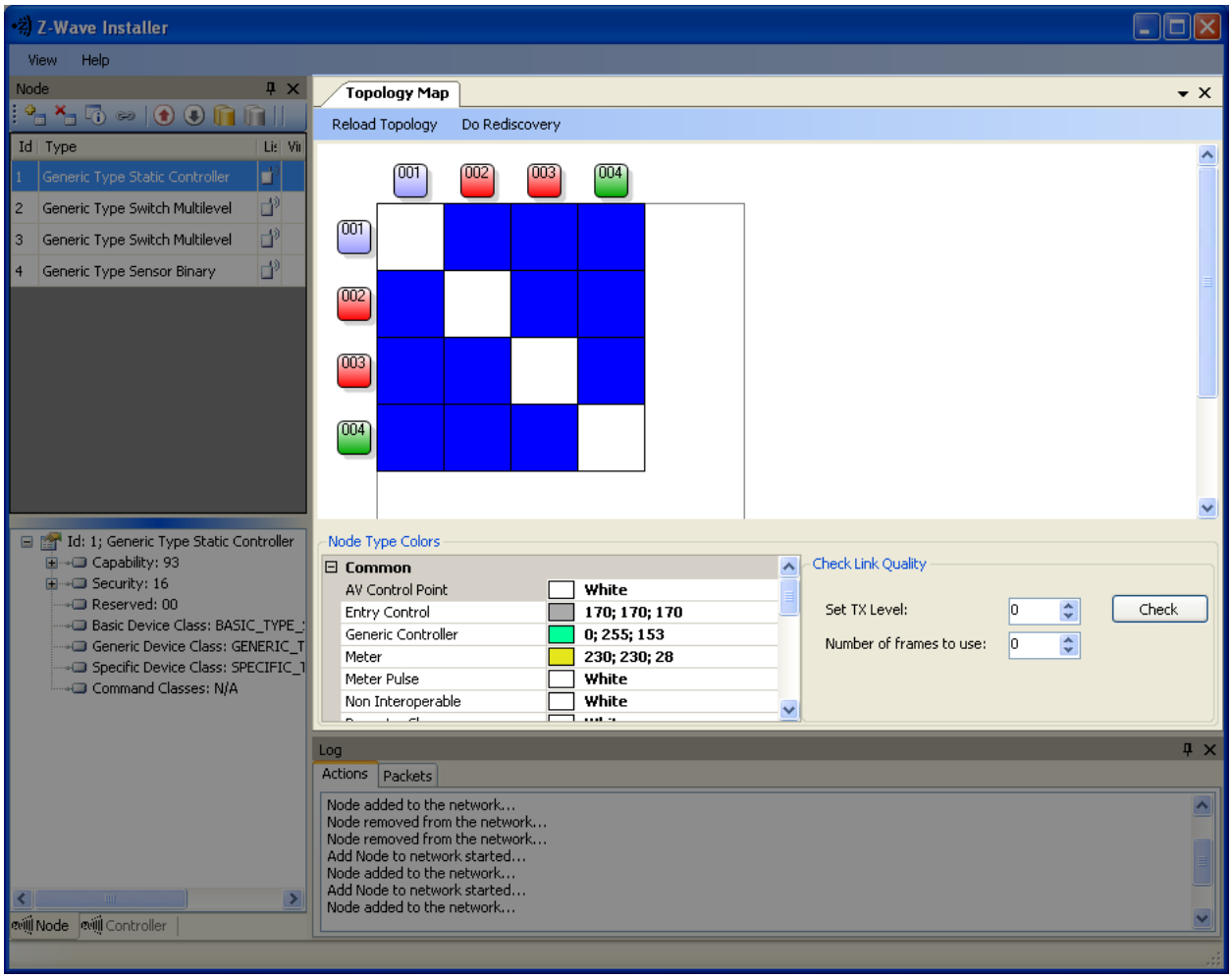

Figure 8. Topology map

The **Topology Map** view consists of:

- The **Graphical topology scheme** itself,
- **Node Type Colors** section,
- **Check Link Quality** section.

4.4.1 The Map

Item	Description
Graphical topology scheme	Graphically represents the network scheme, showing the nodes of all types differentiated through colorization, and the link statuses between the Installer controller and slave nodes.
Reload Topology button	To reload the topology
Do Rediscovery button	To do the rediscovery of the network topology

4.4.2 Node Type Colors

Node Type Colors is a list of node types with colours assigned for graphical representation on the Topology Scheme. It is possible to select a special colour for each node type.

4.4.3 Check Link Quality

Check Link Quality is a tool to check quality of links between nodes in the network. It is possible to set TX level for checking and to set the number of frames to be sent to a node.

4.5 Log view

Here output of current actions is recorded. The two tabs, **Actions** and **Packets**, provide flexible capabilities for control over the Installer Controller's activity.

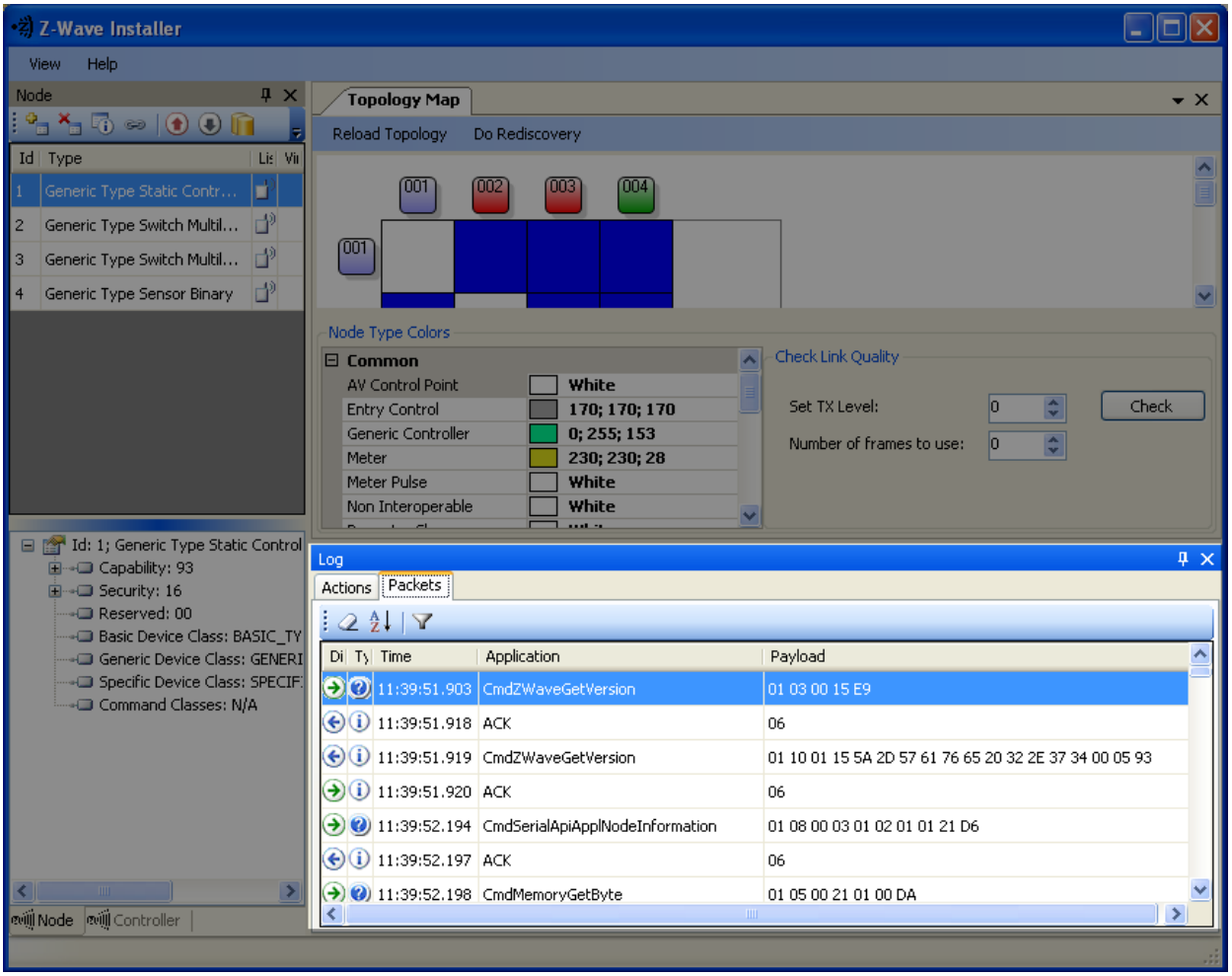

Figure 9. Log view

5 FUNCTIONALITY

5.1 COM port detection

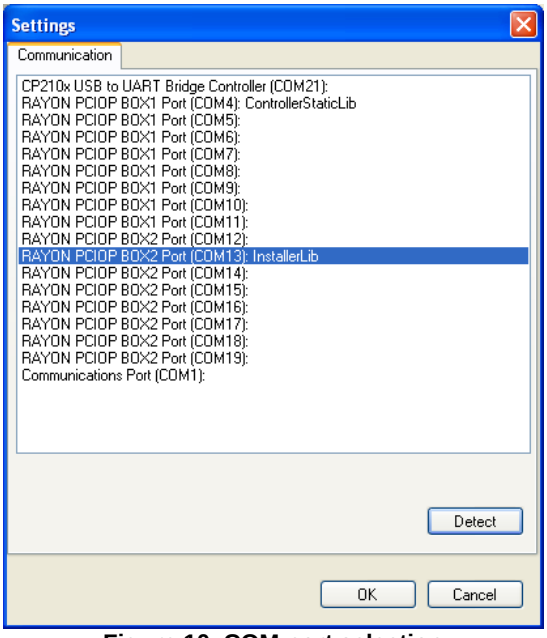

Figure 10. COM port selection

To select the COM port for operation with the Installer Tool, if it has not been detected at startup, go to View > Settings >Detect, as shown in the Figure above.

5.2 Node

5.2.1 Aborting an action

Actions with nodes can be aborted by activating the *"Abort Action"* button.

5.2.2 Add node (Add)

Units are added to the Installer Controller by activating the *"Add"* button and then activating the learn state on the slave node. When a slave unit has been included, it shows up in the node list.

In order to add a node to the Z-Wave network, activate the button ‘Add’. When activating this button, the Status popup message will display ‘Press shortly the pushbutton on the node to be included in the network’. Select the node that should be added to Z-Wave network by activating the node’s button. During the inclusion process, the node must be located at its final position, so that it can obtain the correct neighbours within its range. If the operation was successful, information regarding the node type will be displayed in the node list.

5.2.3 Remove node (Remove)

Activating the “*Remove*” button will exclude/remove a unit.

When a unit has been reset, it will be removed from the node list.

To remove a node from the Z-Wave network, select the node in the node list and activate the button ‘Remove’. After activating the button the Status popup message will display ‘Press shortly the pushbutton on the node to be excluded from the network’. If this operation was completed successfully, the node and its information will now be removed from the node list.

5.2.4 Node Info

This button is used to force request node info from a selected node.

5.2.5 Reach node

This button is used to send a NOP frame to the selected node.

5.2.6 Basic Set ON/OFF command

Sends the BASIC SET command to switch the selected node(s) ON/OFF.

5.2.7 Switch All ON/All OFF command

Sends the BASIC SET command to switch the all included nodes ON/OFF.

5.3 Controller

5.3.1 Learn mode

This button sets the Installer Controller into Learn mode. The Installer Controller receives information from another controller. Activate “Add Node” button on another controller.

5.3.2 Resetting the Installer Tool

Activating the *"Reset"* button resets the Installer Controller back to its original Home ID and Node ID, clears all Node IDs assigned and routing information.

Be aware that resetting the Installer Controller makes it disappear from the network and it will also clear information about which Node ID's it might have assigned already. Reset should only be performed when nodes assigned to the Installer Tool have been cleared.

5.3.3 Controller shift

The Installer Controller sends information to another controller and will be changed to Secondary Controller. Set the receiving controller in learning mode.

5.3.4 Controller’s network role options

The Static Controller can be configured to one of the following controller types:

- **Primary SC**
- **Secondary SC**

- **Secondary Static Controller with Static Update Controller functionality (SUC)**
- **Primary Static Controller with SUC and node ID Server functionality (SIS)**
- **Inclusion SC**

Primary SC

When configured as primary the Static Controller can be used to include/exclude nodes in the Z-Wave network. The primary Static Controller will automatically update a SUC if present in the Z-Wave network. Only one primary controller is allowed in the Z-Wave network.

Secondary SC

When configured as secondary, the Static Controller cannot include/exclude nodes in the Z-Wave network. Several secondary controllers are allowed in the Z-Wave network.

Secondary Static Controller with Static Update Controller functionality (SUC)

When configured as SUC it is not possible to include/exclude nodes in the Z-Wave network, but the SUC can create a new primary controller upon request. Only one secondary controller can act as Static Update Controller (SUC) in the Z-Wave network. The primary controller will automatically update the SUC in case the Z-Wave network changes.

To read more about SUC functionality, see reference **Error! Reference source not found.**.

Primary Static Controller with SUC and node ID Server functionality (SIS)

The SIS enables other controllers to include/exclude nodes in the network on its behalf. The SIS is the primary controller in the network because it has the latest update of the network topology and capability to include/exclude nodes in the network. When including additional controllers to the network they become inclusion controllers because they have the capability to include/exclude nodes in the network on behalf of the SIS. The SIS cannot shift its primary role to other controllers in the network.

To read more about SIS functionality, see reference **Error! Reference source not found.**.

Inclusion Static Controller

The inclusion Static Controller has the capability to include/exclude nodes in the network on behalf of the SIS. The inclusion SC's network topology is dated from last time a node was included or it requested a network update from the SIS and therefore it cannot be classified as a primary controller.

5.3.5 Save Command Classes to device memory

By default, command classes are not stored in the Static Controller memory, but it is possible to save them to the Static Controller's memory using this function. This can be used if a configured Static controller is to be used with another PC.

5.3.6 Load Command Classes from device memory

It is possible to load previously saved command classes from the Static Controller memory using this function.

5.4 Using the Topology area

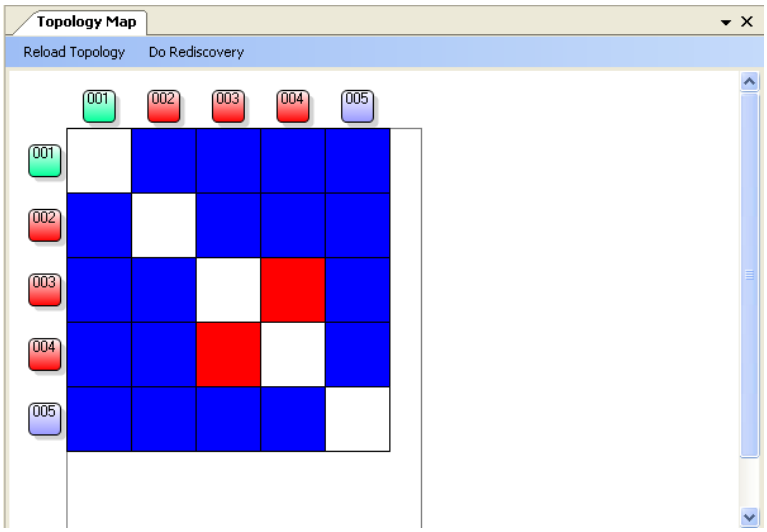

Figure 11. Topology map

One of the major differences between the regular controller API's and the Installer Tool API is that the Installation API gives the application programmer access to the network topology. In this application The Network topology is shown as a graphic like this:

In the current application this graphic is updated on-the-fly when nodes are included/excluded in the network, and the link-state colorization is updated when *"Reload Topology"* or *"Do Rediscovery"* buttons are activated.

The small squares on the sides of the graphic map use the color codes shown in the Node type Colors area.

The larger squares indicate the state of link between two units. Blue squares indicate that the link between two nodes exist, red squares indicates that the link does not exist and white squares indicate that no link can exist. In the above example, all units except 3 and 4 can "see" each other. Note that the table always will be symmetrical around the white line.

5.4.1 Reload Topology

The *"Reload Topology"* button loads the Topology map from the Z-Wave module. This is not done during startup because of the time it takes when the Z-Wave module holds a large network setup.

5.4.2 Rediscovery of nodes in the network

The Installer Tool is capable of requesting a discovery of any listening node in the network. A Discovery is a request to the unit that receives the command to test which other nodes in the network it can reach directly. To update one or more nodes neighbor information, select it/them from the node list and activate *"Do Rediscovery"*. Note that "Request Neighbor Update Successful" (or Failed) in the status popup window does not indicate that the unit has any neighbors, but merely that the unit could be reached and responded with a list of neighbors.

5.4.3 Check link quality.

When the mouse is hovered in the topology graphic field, each square displays the type and nodeIDs of the individual links.

To check link quality between two nodes in a network, click on a square linking the two nodes in question, set **TX Level** and **Number of frames to use** in the **Check link quality** area, and activate the **Check** button.

The test uses a "Power level Test node Set" command, which is part of the Power Level Command class [1]. If the unit receiving the command supports this command class, the unit will transmit the selected number of frames with the selected power to the other node. The actual power levels can be found in [1]. Generally speaking, the higher the number is, the lower power is used. When the test is complete, the result will be displayed in a popup window.

6 REFERENCES

[1] Sigma Designs, SDS11060, Software Design Specification, Z-Wave Command Class Specification
[2] Sigma Designs, INS10244, Instruction, Z-Wave Node Type Overview and Network Installation Guide
[3] Sigma Designs, INS10244, Instruction, Z-Wave Node Type Overview and Network Installation Guide