NuMicro PinView Tool User Manual

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Rev.0.22

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1 Introduction

NuMicro PinView Tool (abbreviated as PinView in the following) is a monitoring and visualization tool that can show the current status of I/O pins on the device immediately, and inform users of some common pin configuration errors. It can run as a standalone application or be used as a plug-in for Keil/IAR IDE.

1.1 Supported Chips and Packages

Please refer to the datasheets from http://www.nuvoton.com.

AU9100 series

- AU9110AN，LQFP48

KM1M7 series

- KM1M7AF，HQFP100/HQFP144

M030G series

- M030GAE，QFN24/QFN33
- M031GAE，QFN24/QFN33

M031 series

- M030AE，TSSOP20/QFN33/LQFP48
- M031AE，TSSOP20/TSSOP28/QFN33/LQFP48/LQFP64/LQFP128
- M032AE，TSSOP20/TSSOP28/QFN33/LQFP48/LQFP64/LQFP128

M051 series

- M052/M054/M058/M0516AN，QFN33/LQFP48
- M052/M054/M058/M0516BN，QFN33/LQFP48
- M052/M054/M058/M0516DN，QFN33/LQFP48
- M052/M054/M058/M0516DE，QFN33/LQFP48

M0518 series

- M0518AE，LQFP48/LQFP64

M0519 series

- M0519AE，LQFP48/LQFP64/LQFP100

M0564 series

- M0564AE，LQFP48/LQFP64/LQFP100

M058S series

- M058SAN，TSSOP20/QFN33/LQFP48/LQFP64

M071 series

- M071AE，LQFP44/LQFP64/LQFP80/LQFP100

M0A21 series

- M0A21AE，SSOP20/TSSOP28

M2351 series

- M2351AE，QFN33/LQFP64/LQFP128

M2353 series

- M2353AE，LQFP64

M2354 series

- M2354AE，LQFP48/LQFP64/LQFP128

M251 series

- M251AE，TSSOP20/TSSOP28/QFN33/LQFP48/LQFP64/LQFP128
- M252AE，TSSOP20/TSSOP28/QFN33/LQFP48/LQFP64/LQFP128
- M253AE，QFN33/LQFP48
- M254AE，LQFP64/LQFP80/LQFP128
- M256AE，LQFP64/LQFP80/LQFP128

- M258AE，LQFP64/LQFP80/LQFP128

M261 series

- M261AE，QFN33/LQFP64/LQFP128
- M262AE，QFN33/LQFP64/LQFP128
- M263AE，QFN33/LQFP64/LQFP128

M451 series

- M451AE，LQFP48/LQFP64/LQFP100
- M452AE，LQFP48/LQFP64
- M453AE，LQFP48/LQFP64/LQFP100
- M451MAE，LQFP48
- M4LED，LQFP48/LQFP64
- M4TK，LQFP48/LQFP64/LQFP100

M4521 series

- M4521AE，LQFP48/LQFP64

M471 series

- M471AE，LQFP64/LQFP80/LQFP100/LQFP128

M479 series

- M479AE，QFN48/LQFP48/LQFP64

M480 series

- M481AE，QFN33/LQFP48/LQFP64
- M482AE，QFN33/LQFP48/LQFP64/LQFP128
- M483AE，LQFP64/LQFP128
- M484AE，LQFP64/LQFP128
- M485AE，QFN33/LQFP48/LQFP64/LQFP128
- M487AE，LQFP64/LQFP128/LQFP144

Mini51 series

- Mini51/Mini52/Mini54AN，QFN33/LQFP48
- Mini51/Mini52/Mini54DE，TSSOP20/QFN33/LQFP48
- Mini55DE，QFN33/LQFP48
- Mini58DE，TSSOP20/QFN33/LQFP48

Mini57 series

- Mini57DE，TSSOP20/TSSOP28/QFN33

ML51 series

- ML51AE，MSOP10/SOP20/SOP28/TSSOP14/TSSOP20/TSSOP28
/QFN20/QFN33/LQFP32/LQFP48/LQFP64

ML54 series

- ML54AE， LQFP44/ LQFP48/ LQFP64

ML56 series

- ML56AE， LQFP44/ LQFP48/ LQFP64

NM1120 series

- NM1120AE，TSSOP20/TSSOP28/QFN20/QFN33

NM1200 series

- NM1100AE，TSSOP20/QFN20
- NM1200AE，QFN33/LQFP48

NM1500 series

- NM1510AE，LQFP48
- NM1530AE，LQFP100
- NM1520AE，LQFP48/LQFP64

NUC029 series

- NUC029AN，QFN33/QFN48/LQFP48
- NUC029AE，TSSOP20

- NUC029DE，LQFP48/LQFP64
- NUC029EE，LQFP48/LQFP64
- NUC029GE，LQFP48/LQFP64

NUC100 series

- NUC100AN，LQFP48/LQFP64/LQFP100
- NUC120AN，LQFP48/LQFP64/LQFP100
- NUC100BN，LQFP48/LQFP64
- NUC101BN，QFN36/LQFP48
- NUC120BN，LQFP48/LQFP64
- NUC130CN，LQFP48/LQFP64/LQFP100
- NUC140CN，LQFP48/LQFP64/LQFP100
- NUC100DN，LQFP48/LQFP64/LQFP100
- NUC120DN，LQFP48/LQFP64/LQFP100

NUC121 series

- NUC121AE，QFN33/LQFP48/LQFP64

NUC122 series

- NUC122AN，QFN33/LQFP48/LQFP64

NUC123 series

- NUC123AN，QFN33/LQFP48/LQFP64
- NUC123AE，QFN33/LQFP48/LQFP64

NUC125 series

- NUC125AE，QFN33/LQFP48/LQFP64

NUC126 series

- NUC126AE，LQFP48/LQFP64/LQFP100

NUC1261 series

- NUC1261AE，LQFP48/LQFP64

NUC1262 series

- NUC1262AE，QFN48/LQFP48/LQFP64

NUC131 series

- NUC131AE，LQFP48/LQFP64

NUC1311 series

- NUC1311AE，LQFP48

NUC200 series

- NUC200AN，LQFP48/LQFP64/LQFP100
- NUC220AN，LQFP48/LQFP64/LQFP100
- NUC230AE，LQFP48/LQFP64/LQFP100
- NUC240AE，LQFP48/LQFP64/LQFP100

NUC2201 series

- NUC2201AE，LQFP48/LQFP64

NUC400 series

- NUC442AE，LQFP64/LQFP100/LQFP128/LQFP144
- NUC472AE，LQFP100/LQFP128/LQFP144/LQFP176

NUC505 series

- NUC505，QFN88/LQFP64/LQFP48

Nano100 series

- Nano100AN，QFN33/LQFP48/LQFP64
- Nano120AN，QFN33/LQFP48/LQFP64
- Nano100BN，LQFP48/LQFP64/LQFP128
- Nano110BN，LQFP64/LQFP128

- Nano120BN，LQFP48/LQFP64/LQFP128
- Nano130BN，LQFP64/LQFP128

Nano103 series

- Nano103AE，LQFP33/LQFP48/LQFP64

Nano112 series

- Nano102AN，LQFP33/LQFP48/LQFP64
- Nano112AN，LQFP48/LQFP64/LQFP100

1.2 System Requirements

1.2.1 Hardware

- Nu-Link In-Circuit Emulator(ICE)

1.2.2 Software

- Please download the standalone version of PinView or the Keil/IAR plug-in version which is included in Nu-Link driver (v1.25.6287 or higher) from nuvoton website, and click the installer file to start the installation wizard. Follow the instructions in the installation wizard to complete the installation.

1.3 Functional Description

1.3.1 Standalone Version

The standalone PinView can monitor the I/O pins on the device without stopping the process of target chip and let users view the pin status updates in real-time. Also, it allows users to load user-defined lua script through the menu **File → Run Script** at the top of the main window to access the chip memory or register, stop a running target, etc. Under the NuTool_PinView installation folder (e.g. C:\Program Files (x86)\Nuvoton Tools\NuTool_PinView), you can find lua script document "ice_functions.txt", and an example "my.lua".

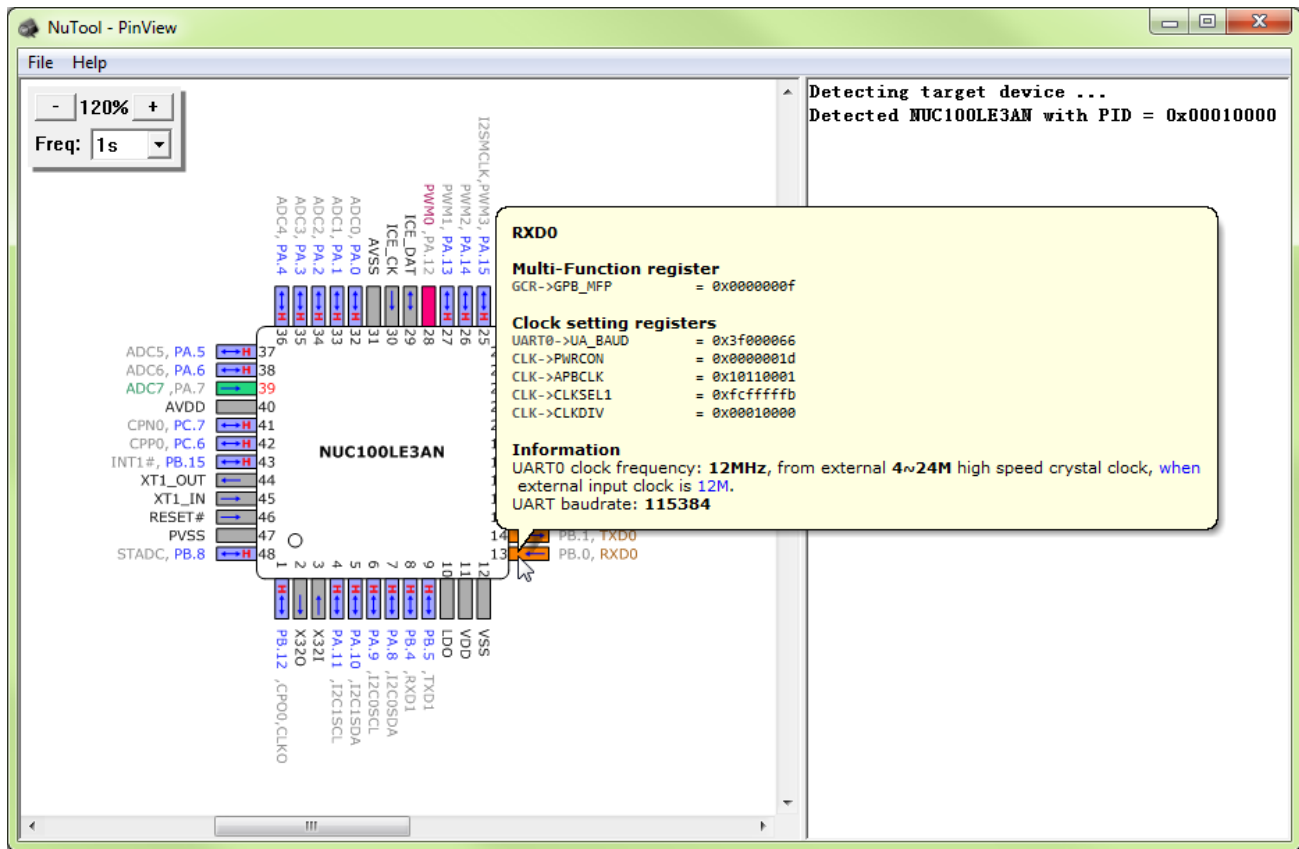The main window is shown as follows:

Figure 1-1 Standalone PinView

1.3.2 Plug-In for Keil/IAR IDE

To use PinView plug-in for Keil/IAR IDE, it's necessary to start a debugging session first and then execute it from the debug menu. For each debug step, it can display the variation in I/O pin status and refreshes the status information periodically until a breakpoint or program exit is reached. The PinView plug-in's main window of IAR IDE is shown as follows:
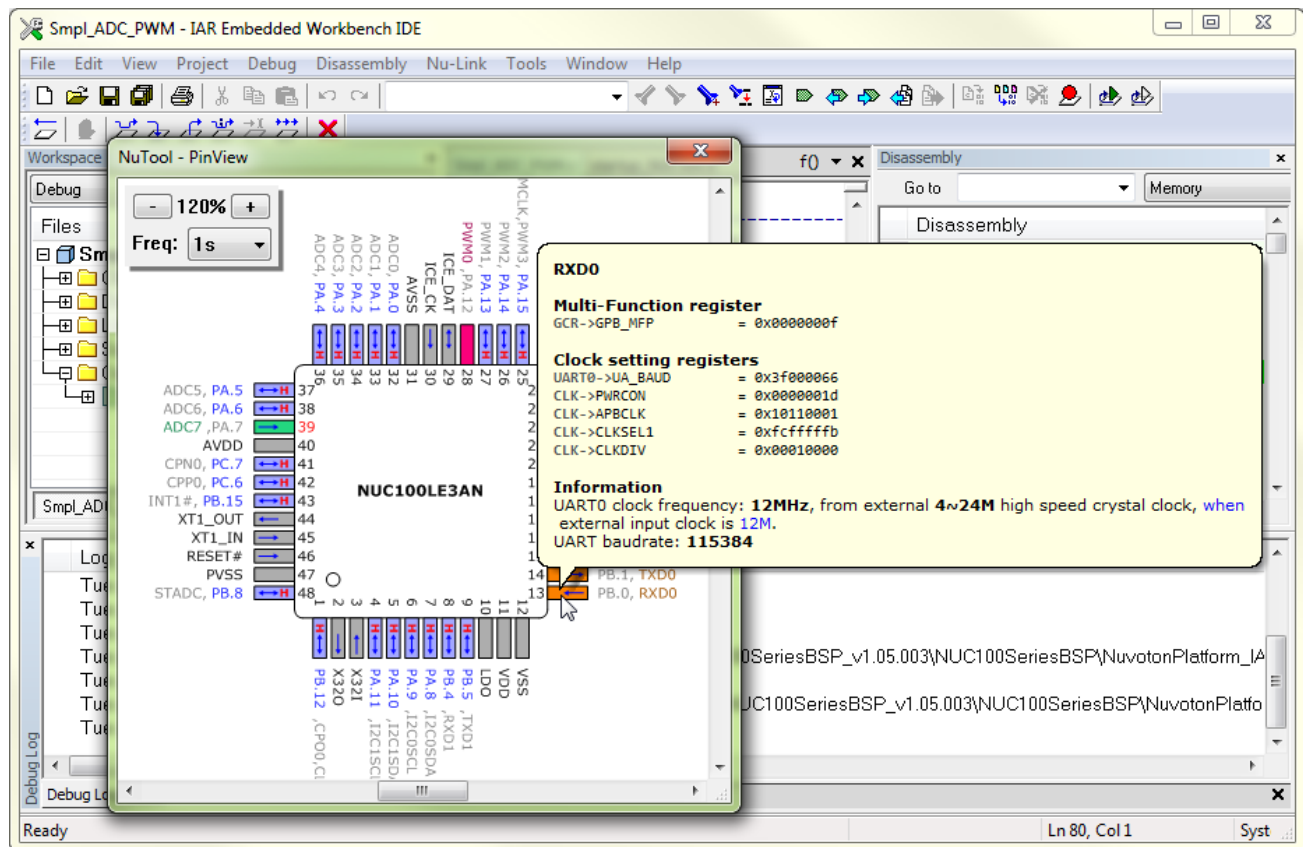
Figure 1-2 PinView Plug-In for IAR IDE

1.4 Features

1.4.1 Display the selected pin function

Identify the pin function using the background and text colors:

- As a general-purpose input/output (GPIO) pin, it shows in blue color.
- As a peripheral device pin (e.g., UART, SPI, PWM), it shows in other colorful colors except blue.
- Others, it shows in gray color.

1.4.2 Display the pin configuration

If you move the mouse cursor over the pin, a pop-up tooltip that includes one or more of the following descriptions will show up:

- The value of multi-function and clock setting registers corresponding to the current pin.
- The text of input and output state descriptions for GPIO.

- The clock source and frequency of peripheral device.
- The baud rate of universal asynchronous receiver/transmitter (UART) device.
- The sampling frequency of Pulse-width modulation (PWM) device.

1.4.3 Display an alert for abnormal pin

While detecting the pin in an abnormal status, the pin number will be displayed in red color. Meanwhile, if you move the mouse cursor over the pin, the pop-up tooltip will show the cause messages in red color. The possible abnormal status is described as follows:

- The electrical leakage for GPIO pin.
- The value of multi-function setting register is undefined.
- The clock source of peripheral device is unavailable.
- The baud rate setting of UART device exceeds the valid range.
- The pre-scale register setting of PWM device is invalid.

1.4.4 User-defined chip setting script

For standalone PinView, it allows user to load user-defined lua script to interact with target chip.

2 Getting Started

2.1 Running PinView

- To execute the standalone PinView, click the **Start button** in the lower-left corner of your screen to open the **Start Menu**, and then select the **Nuvoton Tools** → **NuTool - PinView**.

- The PinView plug-in for Keil IDE can only be used during the debugging session. To execute it, please start a debugging session, and then click the **Debug Menu** → **NuTool - PinView.**
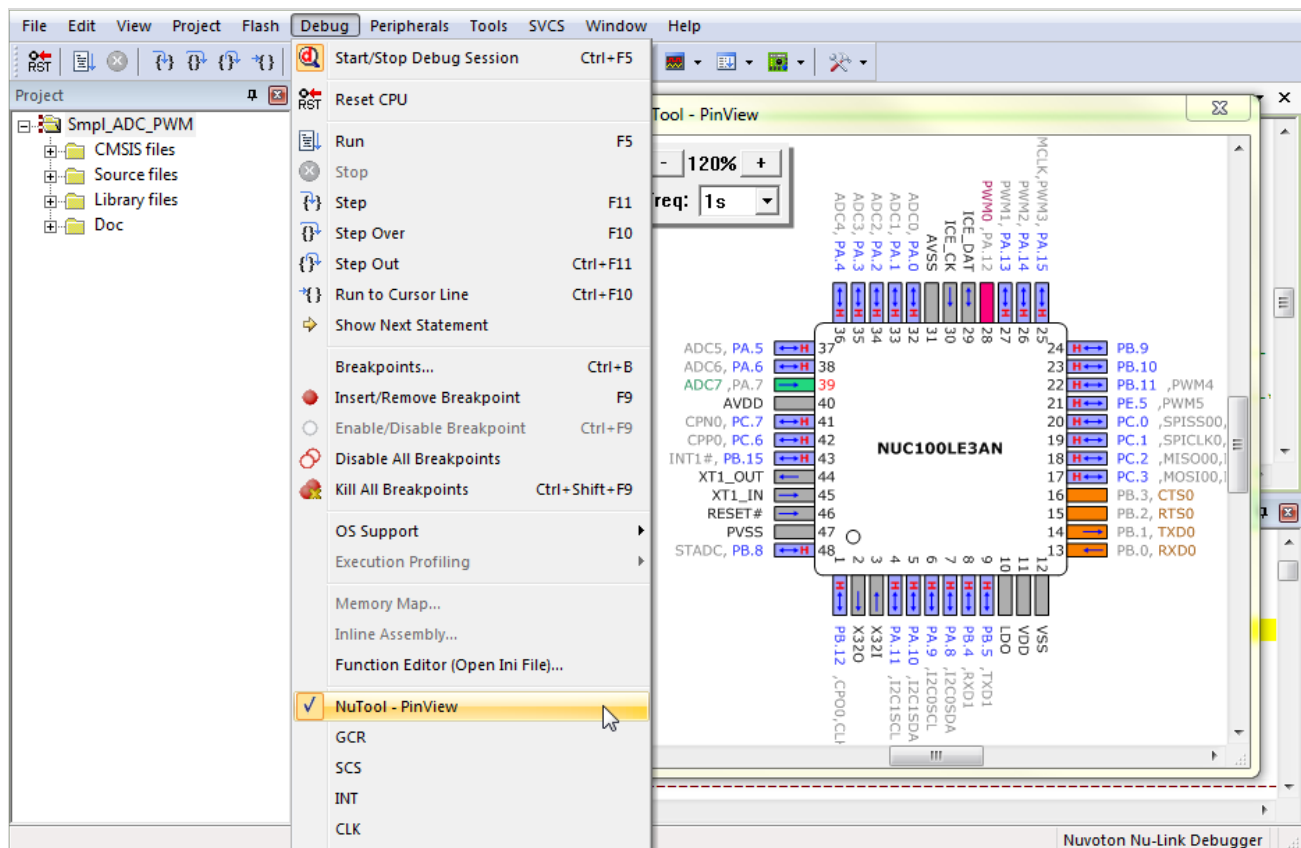

Figure 2-1 Nu-Link Keil Debug Menu

- The PinView plug-in for IAR IDE can only be used during the debugging session. To execute it, please start a debugging session, and then click the **Nu-Link Menu** → **NuTool - PinView**.
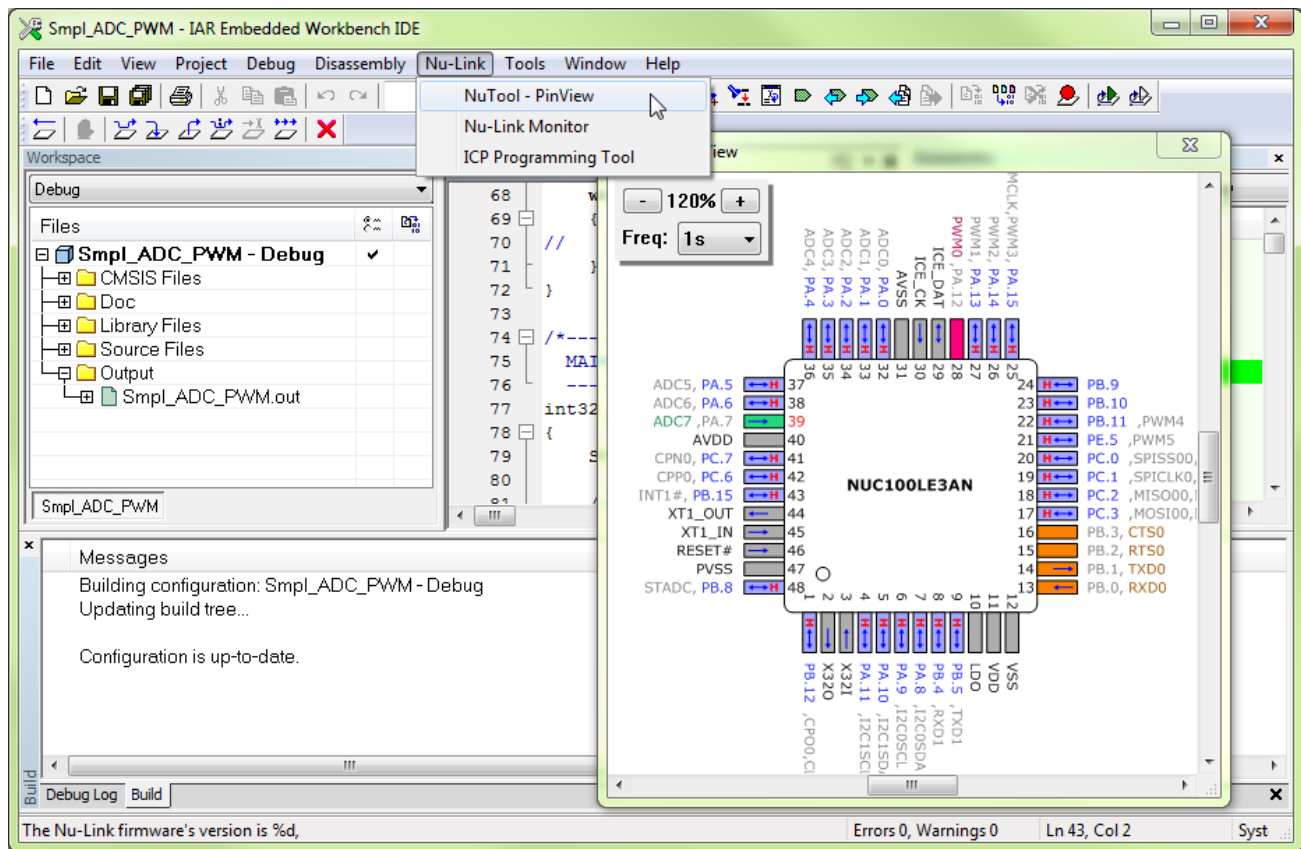
Figure 2-2 Nu-Link IAR Debug Menu

2.2 Main Window

The following figure provides a description for the main window of PinView.

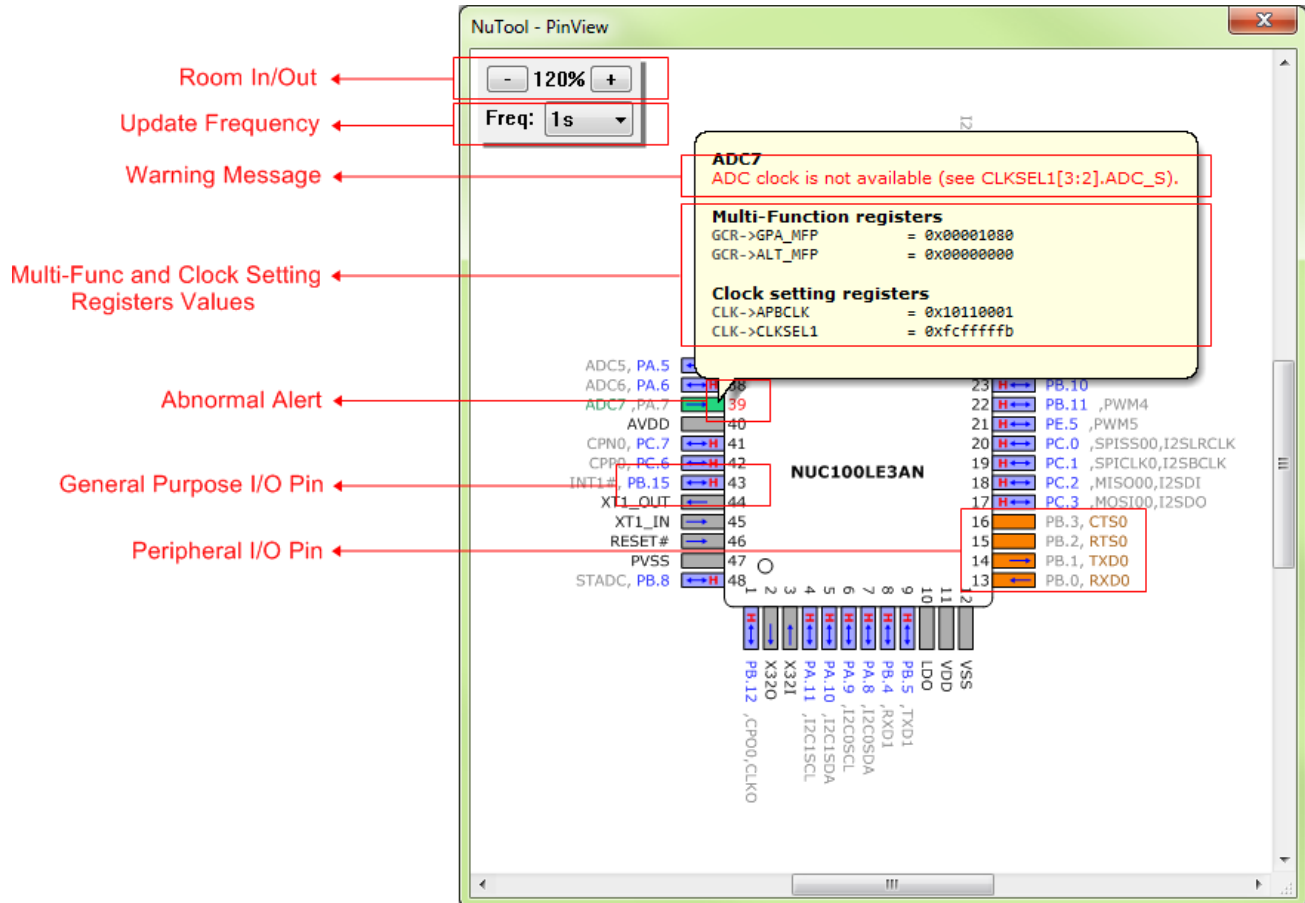Figure 2-3 Main Window of PinView

3 Revision History

Revision	Date	Description
0.01	Dec. 23, 2013	1. First version.
0.02	Jan. 21, 2014	1. Updated all figures.
0.03	Jan. 14, 2015	1. Changed document format.
0.04	Jun. 2, 2017	1. Updated "Supported Chips and Packages" chapter.
0.05	Nov. 8, 2017	1. Updated "Supported Chips and Packages" chapter : Added M2351AE
0.06	Jun. 7, 2018	1. Updated "Supported Chips and Packages" chapter : Added M031AE and M0519AE.
0.07	Jun. 13, 2018	1. Updated "Supported Chips and Packages" chapter : Added M4521AE and NUC2201AE.
0.08	Jun. 28, 2018	1. Updated "Supported Chips and Packages" chapter : Added NUC029DE and NUC029EE.
0.09	Jul. 25, 2018	1. Updated "Supported Chips and Packages" chapter : Added NM1120AE.
0.10	Aug. 6, 2018	1. Updated "Supported Chips and Packages" chapter : Added NUC1261AE and NUC029GE.
0.11	Aug. 31, 2018	1. Updated "Supported Chips and Packages" chapter : Added ML51AE.
0.12	Jan. 22, 2019	1. Updated "Supported Chips and Packages" chapter : Added M251AE.
0.13	Apr. 18, 2019	1. Updated "Supported Chips and Packages" chapter : Added M261AE.
0.14	May. 29, 2019	1. Updated "Supported Chips and Packages" chapter : Added M2353AE.
0.15	Aug. 22, 2019	1. Updated "Supported Chips and Packages" chapter : Added NUC1311AE.
0.16	Sep. 24, 2019	1. Added script description.
0.17	Feb. 19, 2020	1. Updated "Supported Chips and Packages" chapter : Added M479AE.
0.18	Apr. 29, 2020	1. Updated "Supported Chips and Packages" chapter : Added ML54AE and ML56AE.
0.19	Jun. 30, 2020	1. Updated "Supported Chips and Packages" chapter : Added M2354AE.
0.20	Jul. 8, 2020	1. Updated "Supported Chips and Packages" chapter : Added M071AE and M471AE.
0.21	Dec. 24, 2020	1. Updated "Supported Chips and Packages" chapter : Added M030GAE, M031GAE, M0A21AE, M253AE, M254AE, M256AE, M258AE, and NUC1262AE.
0.22	May. 26, 2021	2. Updated "Supported Chips and Packages" chapter : Added KM1M7AF