

NuTool – LCDView

User Manual

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Table of Contents

1 OVERVIEW	4
1.1 Supported Chips.....	4
2 FEATURES	4
3 REQUIREMENTS.....	4
4 QUICK START	5
4.1 Tool Installation	5
4.2 Tool Execution.....	6
5 USER INTERFACE GUIDE.....	7
5.1 Window Overview.....	7
5.1.1 Mode Selection	8
5.1.2 Toolbar	9
5.1.3 Adjust Canvas Size	11
5.1.4 Show Grid.....	12
5.1.5 Select Field of Chip Series and Part No.	13
5.1.6 Icon & Canvas.....	14
5.1.7 Status Bar.....	15
5.1.8 Com/Seg Table	16
5.2 Using the Tool	17
6 REVISION HISTORY	18

List of Figures

Figure 4-1 Installation File	5
Figure 4-2 Installation Screen	5
Figure 4-3 Execution Icon	6
Figure 5-1 LCDView Window	7
Figure 5-2 Create Mode	8
Figure 5-3 Emulator Mode	8
Figure 5-4 NuTool – LCDView Toolbar	9
Figure 5-5 Adjust Canvas Size	11
Figure 5-6 Show Grid	12
Figure 5-7 Select Part Number	13
Figure 5-8 Canvas after Edited	14
Figure 5-9 Zoom In/Out Icon	14
Figure 5-10 Status Bar	15
Figure 5-11 Com/Seg Table	16
Figure 5-12 BSP Code Sample	17
Figure 5-13 Synchronized Canvas	17

1 OVERVIEW

The **NuTool – LCDView** is used to synchronously display the LCD view on the PC by setting up the Com/Seg table and the icons on Canvas. User can freely design the pattern of screen to emulate each type of LCD view.

1.1 Supported Chips

To see the list of supported chips, refer to Supported_chips.htm in C:\Program Files (x86) \Nuvoton Tools\NuTool_LCDView.

2 FEATURES

Features are listed below:

- **Design Canvas by built-in tools:** Use built-in icon, or import SVG file created by user, and place these icons on Canvas to simulate the LCD screen.
- **Code generation:** Generate a header file according to user's design; the generated header file is applied to LCD samples in NuMicro BSP.
- **Synchronously display the LCD view:** By configuring pins, user's Canvas can synchronously display the LCD view when connecting a chip.

Through the application, the user can emulate LCDView on the PC if the LCD screen is not ready.

3 REQUIREMENTS

To use LCDView, software and hardware requirements are listed below:

- Windows 7 or later operating system
- Internet Explorer 10 or later
- Nu-Link debug probe, for emulator function

4 QUICK START

4.1 Tool Installation

Follow the steps below to install the application:

1. Locate and double-click the .exe file.

 NuTool - LCDView 1.05.exe	2022/6/1 下午 05:34	Application	2,165 KB
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Figure 4-1 Installation File

2. A dialog box will appear. Follow the instructions to install the software.

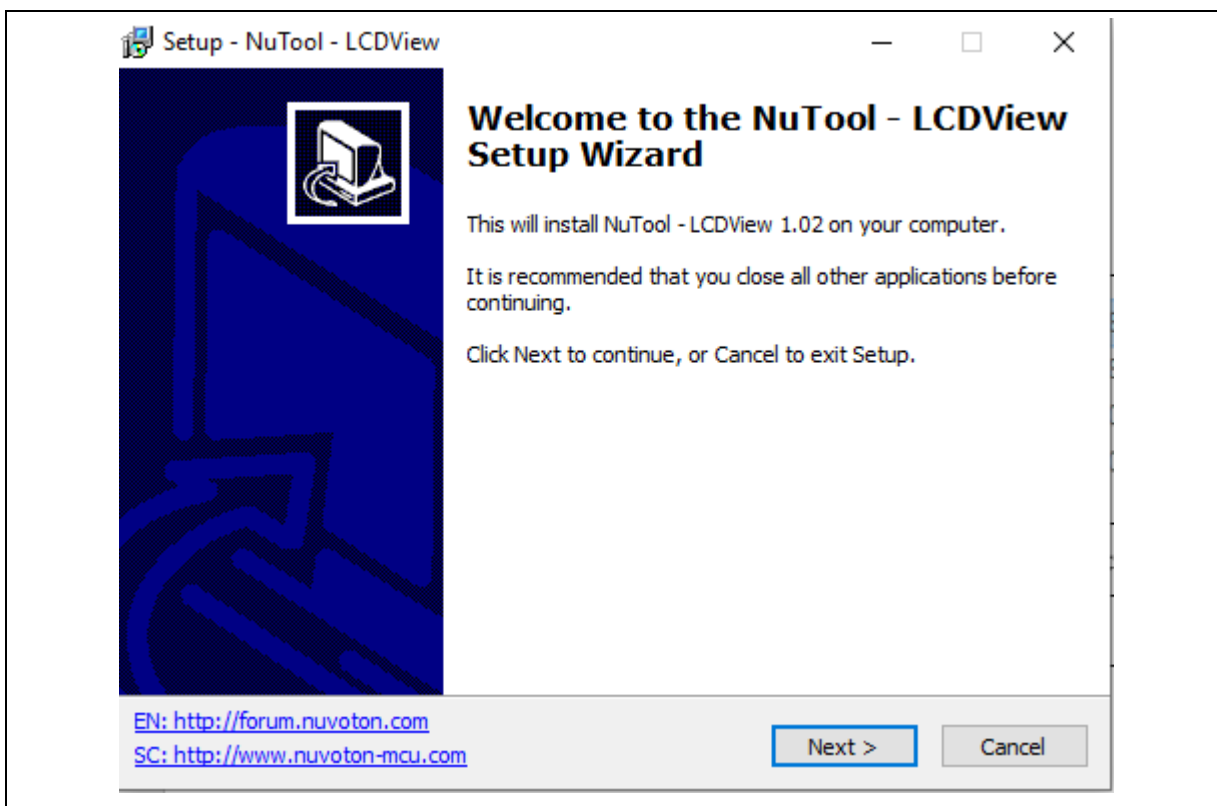


Figure 4-2 Installation Screen

3. The software will be installed.

4.2 Tool Execution

Click the start menu of Windows, and select **Nuvoton Tools** -> **NuTool – LCDView**.

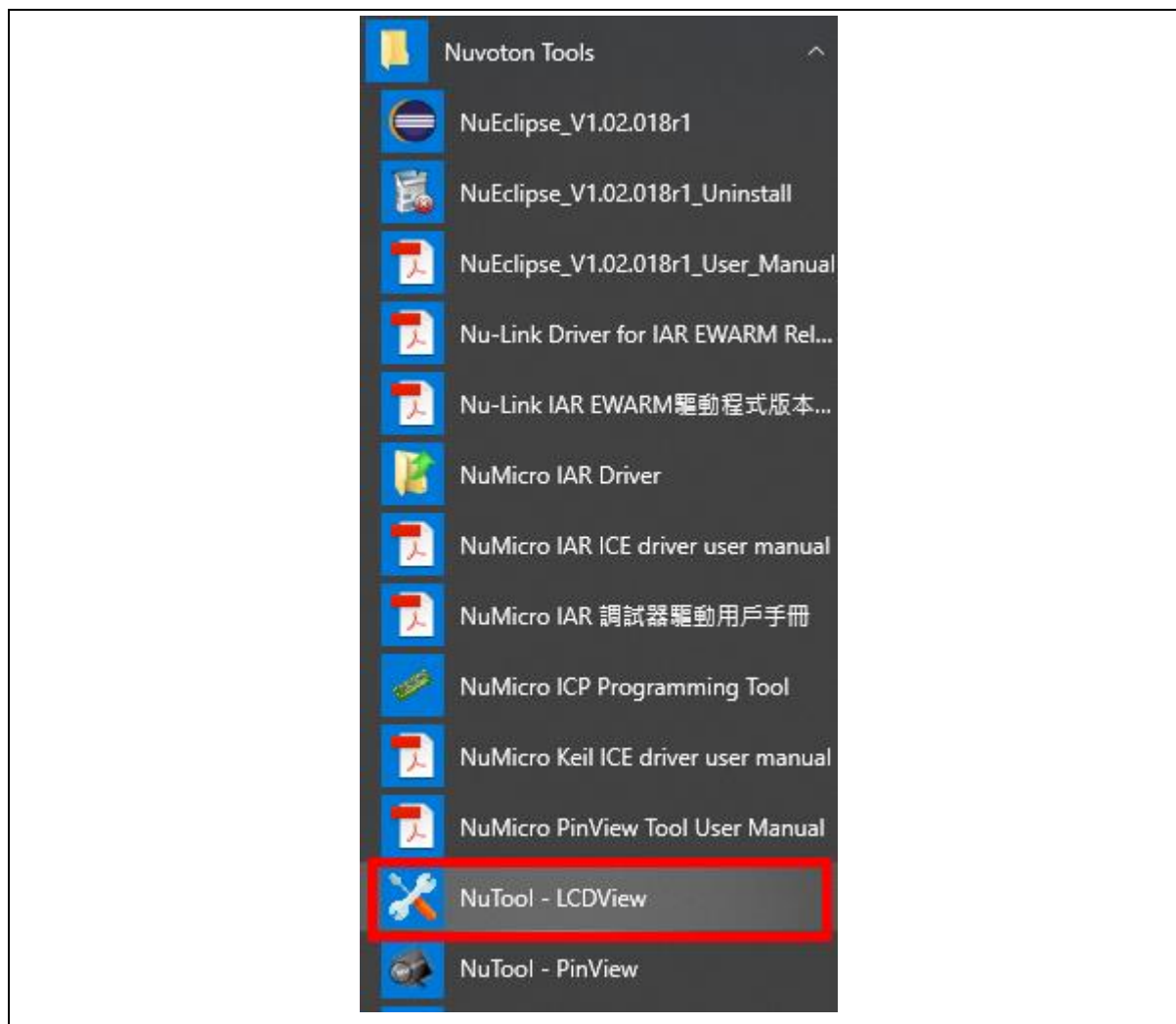


Figure 4-3 Execution Icon

5 USER INTERFACE GUIDE

5.1 Window Overview

The **NuTool - LCDView** window includes a variety of components. The components are described in the following sections.

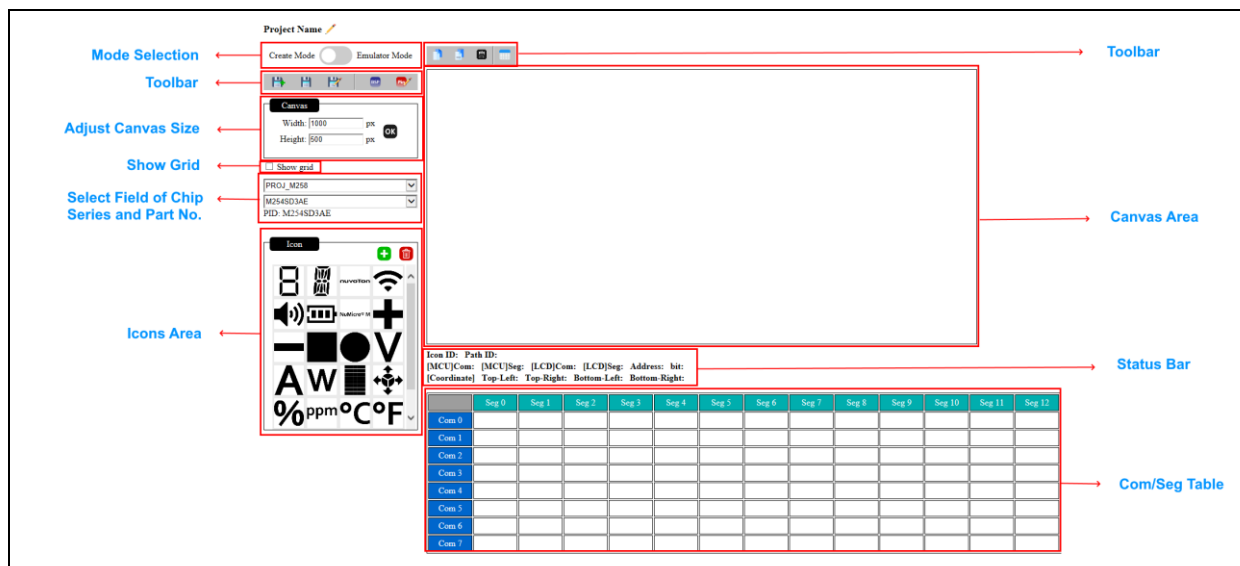


Figure 5-1 LCDView Window

5.1.1 Mode Selection

5.1.1.1 Create Mode

In Create Mode, user can edit the pattern of Canvas, including editing the size of Canvas, style of icon, and Com/Seg table.

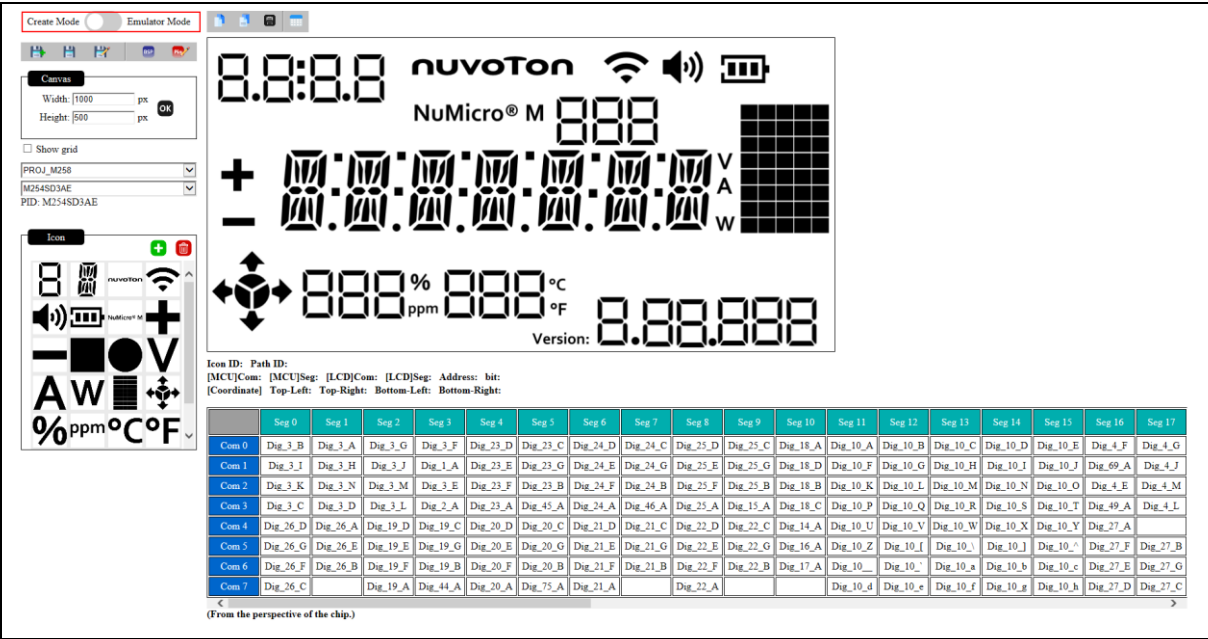


Figure 5-2 Create Mode

5.1.1.2 Emulator Mode

With Canvas setup is completed, connect with a chip and switch to emulator mode. User will see the view on Canvas synchronizes with the LCD view on the chip. Note that in emulator mode system will hide any editable options to avoid emulator function being affected.

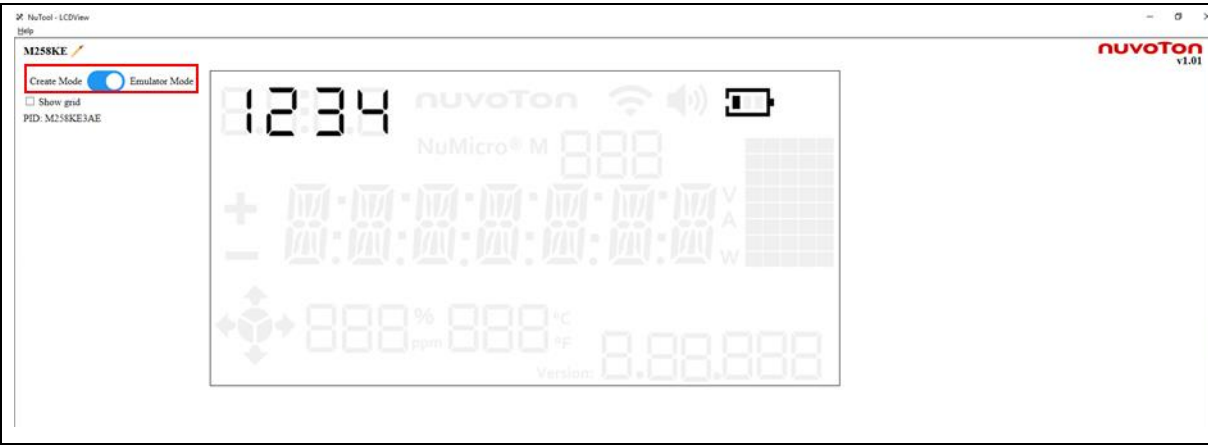


Figure 5-3 Emulator Mode

5.1.2 Toolbar

The icons on the toolbar are shown and described below.

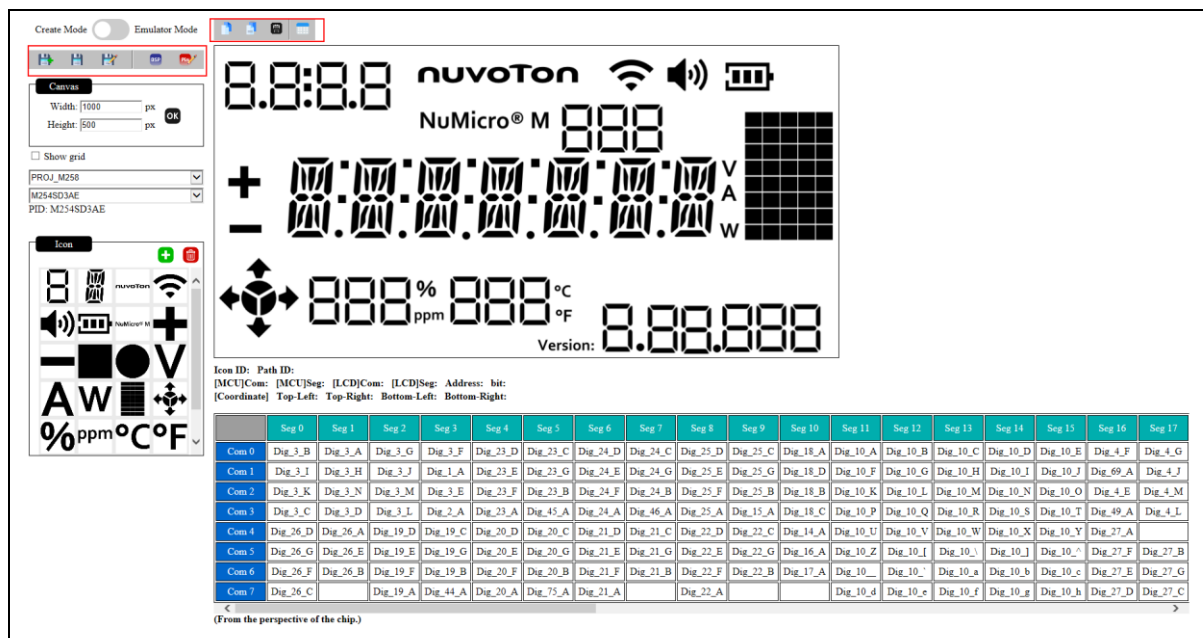



Figure 5-4 NuTool – LCDView Toolbar

5.1.2.1 Create New Project

To create new project, click the **Create project**  icon on the toolbar.

5.1.2.2 Save Project

To Save current status (Canvas, Com/Seg Table, SVG file uploaded by user), follow the steps below:

1. Click the Save project  icon on the toolbar.
2. The current status will be saved to nvt file. It can also be recovered by loading project.


5.1.2.3 Load Project

To recover saved status, click the **Load project**  icon on the toolbar, and select the needed NVT file.

5.1.2.4 Generate Header File

When Canvas setup is completed, click the **Generate header file**  icon on the toolbar to create a header file for BSP.


5.1.2.5 Load Pinconfig Config File

Click the **Load Pinconfig .cfg file**  icon on the toolbar to show the corresponding pin number on the Com/Seg table. (It is recommended to use NuTool-PinConfigure tool and set using Com/Seg pins, then export for NuTool-LCDView).


5.1.2.6 Copy

To copy the selecting icon, click the **Copy**  icon on the toolbar.


5.1.2.7 Paste

To paste the copied icon, click the **Paste**  icon on the toolbar, and the pasted icon would be added into the canvas.

5.1.2.8 Delete Selected Icon on Canvas

If an icon is not needed, select the icon on Canvas and click **Delete selected icon on Canvas**  icon on the toolbar.

5.1.2.9 Conversion Table

Click the **Conversion Table**  icon, it shows a form that user can manually fill the mapping of Com/Seg definition for MCU and LCD. After completing filling the table, the converted result will show on the Status Bar when user click any path of icon.

5.1.3 Adjust Canvas Size

The Canvas size can be modified by entering values in Width and Height column.

M258KE

Create Mode Emulator Mode

Canvas

Width: 1000 px

Height: 500 px

OK

☐ Show grid

PROJ: M258

M254SD3AE

PID: M254SD3AE

Icon

8

+

-

AW

%

ppm

°C

°F

8.8:8.8 nuvoTon

NuMicro® M 888

+ 8.8:8.8:8.8:8.8:8.8:8.8 V A

- 8.8:8.8:8.8:8.8:8.8:8.8 W

8.8:8.8:8.8 % 8.8:8.8 °C

8.8:8.8 °F

Version: 8.8.8.8.8.8.8.8

Icon ID: Path ID:

[MCU]Com: [MCU]Seg: [LCD]Com: [LCD]Seg: Address: bit:

[Coordinate] Top-Left: Top-Right: Bottom-Left: Bottom-Right:

	Seg 0	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	Seg 9	Seg 10	Seg 11	Seg 12	Seg 13	Seg 14	Seg 15	Seg 16	Seg 17
Com 0	Dig_3_B	Dig_3_A	Dig_3_G	Dig_3_F	Dig_23_D	Dig_23_C	Dig_24_D	Dig_24_C	Dig_25_D	Dig_25_C	Dig_18_A	Dig_10_A	Dig_10_B	Dig_10_C	Dig_10_D	Dig_10_E	Dig_4_F	Dig_4_G
Com 1	Dig_3_I	Dig_3_H	Dig_3_J	Dig_1_A	Dig_23_E	Dig_23_G	Dig_24_E	Dig_24_G	Dig_25_E	Dig_25_G	Dig_18_D	Dig_10_F	Dig_10_G	Dig_10_H	Dig_10_I	Dig_10_J	Dig_49_A	Dig_4_J
Com 2	Dig_3_K	Dig_3_N	Dig_3_M	Dig_3_E	Dig_23_F	Dig_23_B	Dig_24_F	Dig_24_B	Dig_25_F	Dig_25_B	Dig_18_B	Dig_10_K	Dig_10_L	Dig_10_M	Dig_10_N	Dig_10_O	Dig_4_E	Dig_4_M
Com 3	Dig_3_C	Dig_3_D	Dig_3_L	Dig_2_A	Dig_23_A	Dig_45_A	Dig_24_A	Dig_46_A	Dig_25_A	Dig_15_A	Dig_18_C	Dig_10_P	Dig_10_Q	Dig_10_R	Dig_10_S	Dig_10_T	Dig_49_A	Dig_4_L
Com 4	Dig_26_D	Dig_26_A	Dig_19_D	Dig_19_C	Dig_20_D	Dig_20_C	Dig_21_D	Dig_21_C	Dig_22_D	Dig_22_C	Dig_14_A	Dig_10_U	Dig_10_V	Dig_10_W	Dig_10_X	Dig_10_Y	Dig_27_A	
Com 5	Dig_26_G	Dig_26_E	Dig_19_E	Dig_19_G	Dig_20_E	Dig_20_G	Dig_21_E	Dig_21_G	Dig_22_E	Dig_22_G	Dig_16_A	Dig_10_Z	Dig_10_I	Dig_10_J	Dig_10_K	Dig_10_L	Dig_27_F	Dig_27_B
Com 6	Dig_26_F	Dig_26_B	Dig_19_F	Dig_19_B	Dig_20_F	Dig_20_B	Dig_21_F	Dig_21_B	Dig_22_F	Dig_22_B	Dig_17_A	Dig_10_	Dig_10_	Dig_10_a	Dig_10_b	Dig_10_c	Dig_27_E	Dig_27_G
Com 7	Dig_26_C		Dig_19_A	Dig_44_A	Dig_20_A	Dig_75_A	Dig_21_A		Dig_22_A			Dig_10_d	Dig_10_e	Dig_10_f	Dig_10_g	Dig_10_h	Dig_27_D	Dig_27_C

Figure 5-5 Adjust Canvas Size

5.1.4 Show Grid

The checkbox can be enabled to show grids on Canvas.

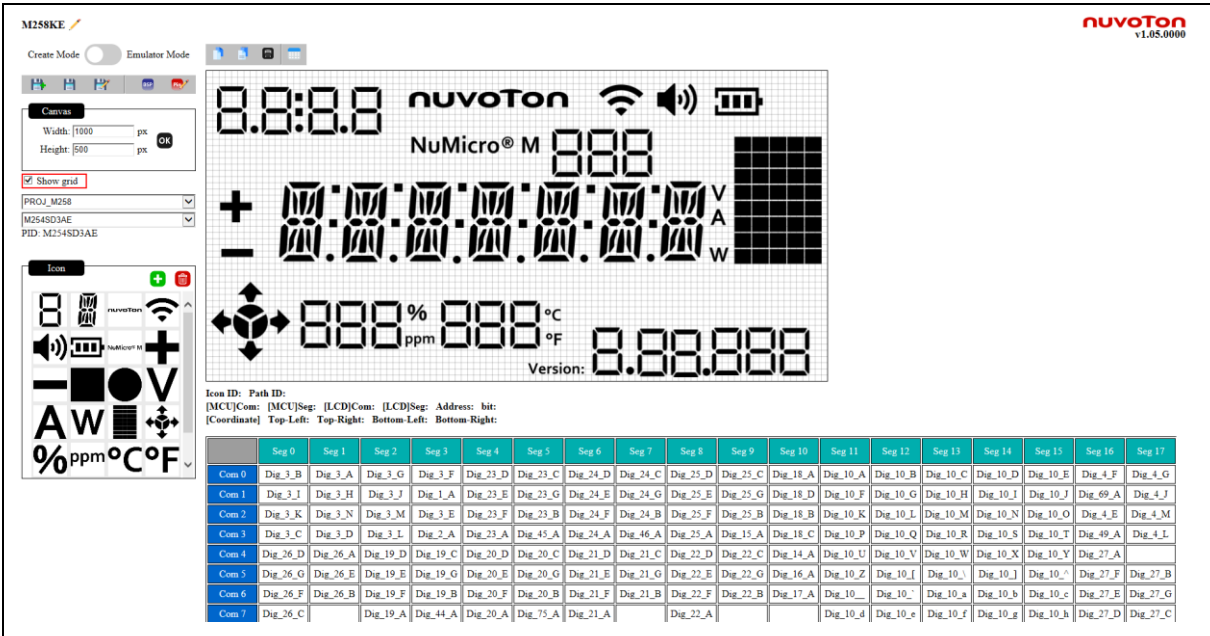


Figure 5-6 Show Grid

5.1.5 Select Field of Chip Series and Part No.

The user can select the chip series and part number of project. After selecting, the system will open a new project and set corresponding initial Com/Seg numbers.

Create Mode ☐ Emulator Mode

Save Open Print BSP Pin

Canvas

Width: 1000 px

Height: 500 px **OK**

☒ Show grid

PROJ_M258

- M254SD3AE
- M254SE3AE
- M254QD3AE
- M254QE3AE
- M254KD3AE
- M254KE3AE
- M256SD3AE
- M256SE3AE
- M256QD3AE
- M256QE3AE
- M256KD3AE
- M256KE3AE
- M258SD3AE
- M258SE3AE
- M258QD3AE
- M258QE3AE
- M258KD3AE
- M258KE3AE

AW

% ppm °C °F

Figure 5-7 Select Part Number

5.1.6 Icon & Canvas

The tool has icons for M258KE3AE screen. User can drag any of the icons and drop the icon to the Canvas. Any icon on Canvas can also be moved and re-sized to emulate the LCD view.

User can import customized SVG file into icon column using the “+” button. Only a SVG file can be imported. The SVG file can be created by a 3rd party tool such as “inkscape” / “adobe”. Also, the same layer of SVG can be lighted together. If user needs to delete an imported icon, select the icon and click the Delete button.

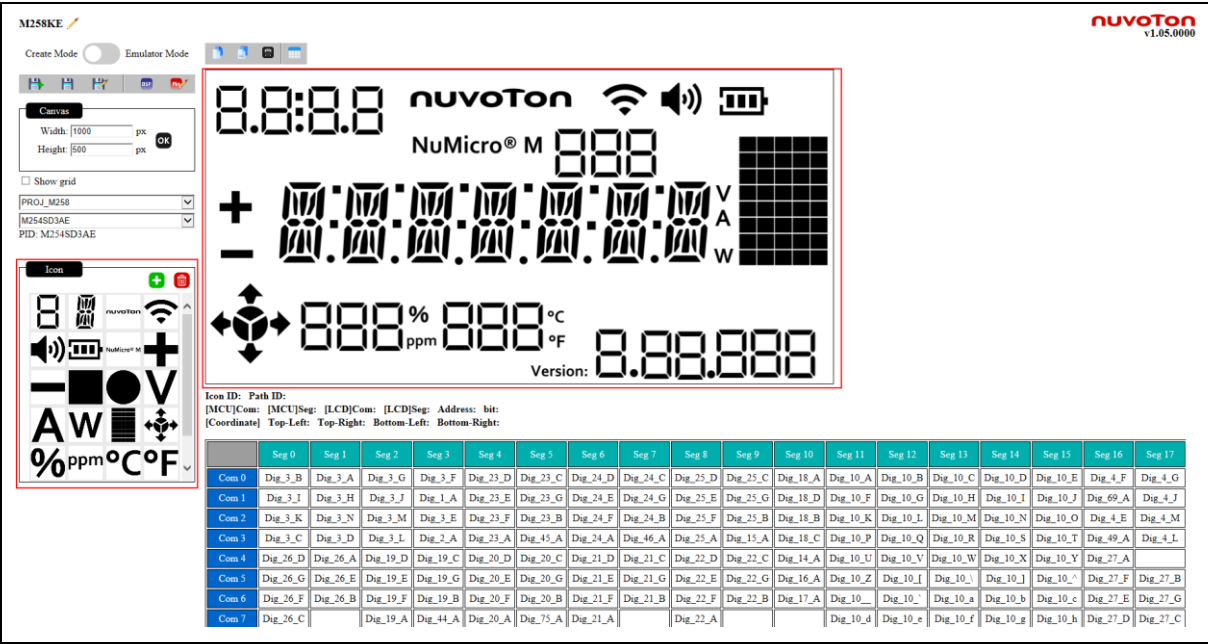


Figure 5-8 Canvas after Edited

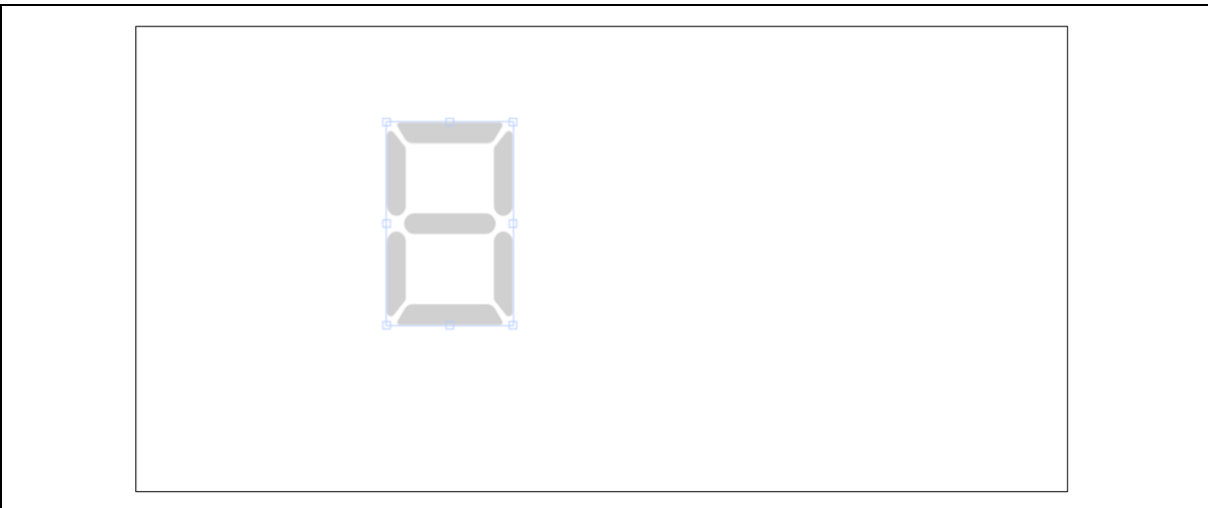


Figure 5-9 Zoom In/Out Icon

5.1.7 Status Bar

When selecting any of the icons on Canvas, the Status Bar under Canvas will show some information about the icon, as shown below.

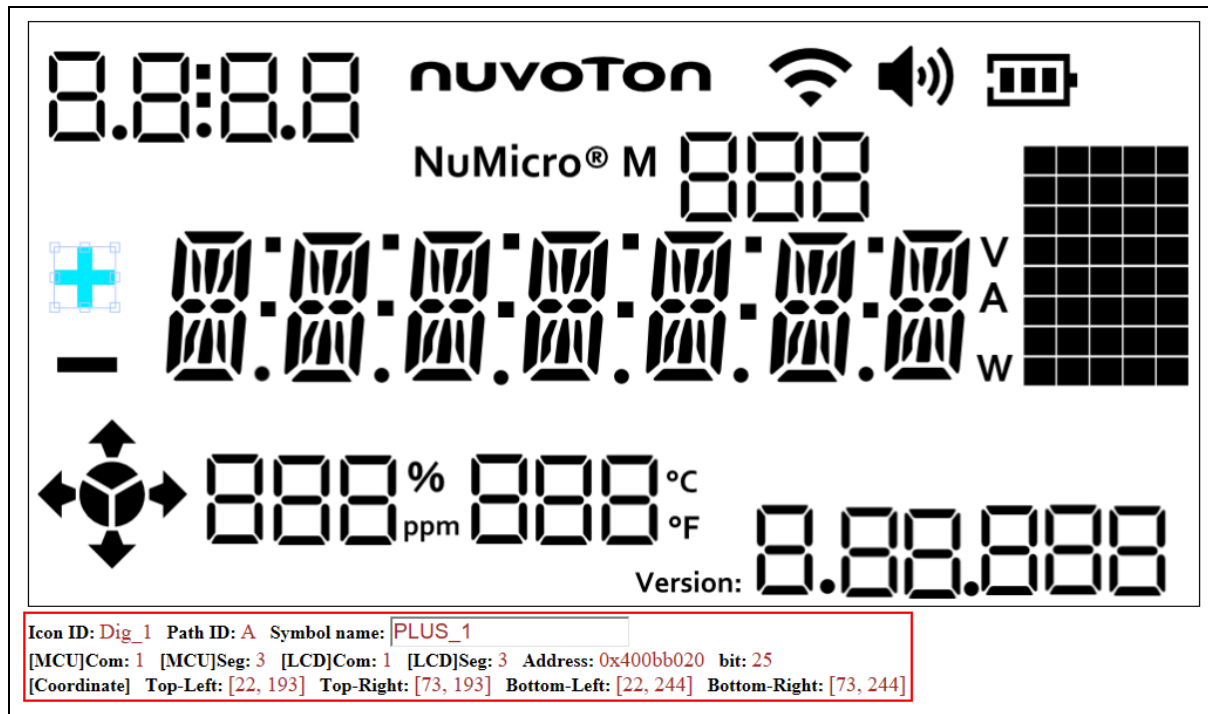
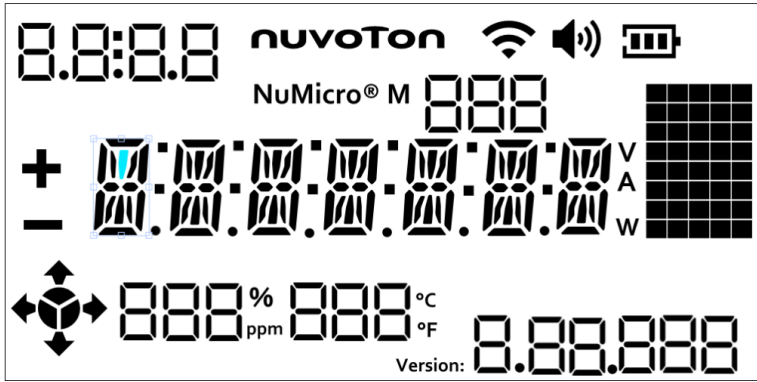


Figure 5-10 Status Bar

- **Icon ID:** Each icon has its unique ID. The value will be assigned by system.
- **Path ID:** Since SVG is a vector illustration, each element is composed by a path. Each path has its unique ID. The value will be assigned by system.
- **Group name:** User can control all the icons with the same group name by setting the 7-segment display or 14-segment display to specific ID for group name. It will be used when creating a header file.
- **Symbol name:** Set ID for selected icon. It will be used when creating a header file. The value will be assigned by system, but user can update it.
- **[MCU]Com / [MCU]Seg:** The index of Com/Seg in MCU view.
- **[LCD]Com / [LCD]Seg:** The index of Com/Seg in LCD view.
- **Address:** The register address of Chip according to the selected path's Com/Seg.
- **Bit:** The bit of register address according to the selected path's Com/Seg
- **Coordinates:** The coordinates with the selected icon. User can update it with keyboard arrow key.

5.1.8 Com/Seg Table

Each path has its corresponding Com/Seg. User should select a path on Canvas and click related Com/Seg Table. The selected grid should be filled with the corresponding Icon ID + Path ID. When clicking any icon on Canvas, all the grids connected to their path will be highlight with a red frame.



Icon ID: Dig_3 Path ID: H Group name: MAIN

[MCU]Com: 1 [MCU]Seg: 1 [LCD]Com: 1 [LCD]Seg: 1 Address: 0x400bb020 bit: 9

[Coordinate] Top-Left: [117, 179] Top-Right: [190, 179] Bottom-Left: [117, 308] Bottom-Right: [190, 308]

	Seg 0	Seg 1	Seg 2	Seg 3	Seg 4	Seg 5	Seg 6	Seg 7	Seg 8	Seg 9	Seg 10	Seg 11	Seg 12	Seg 13	Seg 14	Seg 15	Seg 16	Seg 17
Com 0	Dig_3_B	Dig_3_A	Dig_3_G	Dig_3_F	Dig_23_D	Dig_23_C	Dig_24_D	Dig_24_C	Dig_25_D	Dig_25_C	Dig_18_A	Dig_10_A	Dig_10_B	Dig_10_C	Dig_10_D	Dig_10_E	Dig_4_F	Dig_4_G
Com 1	Dig_3_I	Dig_3_H	Dig_3_J	Dig_1_A	Dig_23_E	Dig_23_G	Dig_24_E	Dig_24_G	Dig_25_E	Dig_25_G	Dig_18_D	Dig_10_F	Dig_10_G	Dig_10_H	Dig_10_I	Dig_10_J	Dig_69_A	Dig_4_J
Com 2	Dig_3_K	Dig_3_N	Dig_3_M	Dig_3_E	Dig_23_F	Dig_23_B	Dig_24_F	Dig_24_B	Dig_25_F	Dig_25_B	Dig_18_B	Dig_10_K	Dig_10_L	Dig_10_M	Dig_10_N	Dig_10_O	Dig_4_E	Dig_4_M
Com 3	Dig_3_C	Dig_3_D	Dig_3_L	Dig_2_A	Dig_23_A	Dig_45_A	Dig_24_A	Dig_46_A	Dig_25_A	Dig_15_A	Dig_18_C	Dig_10_P	Dig_10_Q	Dig_10_R	Dig_10_S	Dig_10_T	Dig_49_A	Dig_4_L
Com 4	Dig_26_D	Dig_26_A	Dig_19_D	Dig_19_C	Dig_20_D	Dig_20_C	Dig_21_D	Dig_21_C	Dig_22_D	Dig_22_C	Dig_14_A	Dig_10_U	Dig_10_V	Dig_10_W	Dig_10_X	Dig_10_Y	Dig_27_A	
Com 5	Dig_26_G	Dig_26_E	Dig_19_E	Dig_19_G	Dig_20_E	Dig_20_G	Dig_21_E	Dig_21_G	Dig_22_E	Dig_22_G	Dig_16_A	Dig_10_Z	Dig_10_I	Dig_10_	Dig_10_	Dig_10_	Dig_27_F	Dig_27_B
Com 6	Dig_26_F	Dig_26_B	Dig_19_F	Dig_19_B	Dig_20_F	Dig_20_B	Dig_21_F	Dig_21_B	Dig_22_F	Dig_22_B	Dig_17_A	Dig_10_	Dig_10_	Dig_10_a	Dig_10_b	Dig_10_c	Dig_27_E	Dig_27_G
Com 7	Dig_26_C		Dig_19_A	Dig_44_A	Dig_20_A	Dig_75_A	Dig_21_A		Dig_22_A			Dig_10_d	Dig_10_e	Dig_10_f	Dig_10_g	Dig_10_h	Dig_27_D	Dig_27_C

< (From the perspective of the chip.) >

Figure 5-11 Com/Seg Table

5.2 Using the Tool

The tool can be used with Nuvoton BSP sample. Follow the steps below:

1. Select the Chip series and part number.
2. Use Create Mode to create the LCD-like canvas, and set up the Com/Seg Table with corresponding icon by documents, then save it to NVT file.
 - User should manually assign the group name of each 7-segment display or 14-segment display; otherwise, these icons will not be recognized in lcdzone.h file.
 - The same group of each 7-segment display or 14-segment display should be assigned to the same ID.
 - Other icon's symbol name will be auto assigned.
3. Click Generate header file and replace original lcdzone.h file with the folder LCD_* sample code (e.g. LCD_Print_Text) provided by BSP.
4. Open main.c in the project. User can set what to show on LCD screen within main function.
 - **Printf:** Set the word of a set of 7-segment display or 14-segment display.
 - **SetSymbol:** Set whether to show other types of icons. (1 means to show).

```
LCDLIB_SetSymbol(SYMBOL_SOUND_17, 1);
LCDLIB_SetSymbol(SYMBOL_BAT_1_18, 1);
LCDLIB_SetSymbol(SYMBOL_BAT_3_18, 1);

LCDLIB_Printf(ZONE_MAIN_DIGIT, "NUVOTON");
```

Figure 5-12 BSP Code Sample

5. Replace the pin config of Configure_LCD_Pins() function in main.c with the code generated by the NuTool-PinConfigure tool. The project can only work by correct pin config and lcdzone.h.
6. Execute Build command and download code into chip. Open LCDView. Load the NVT file described in Step 1 or created before. Then, open emulator mode, and you can see that Canvas is shown synchronously with LCD screen on the chip.



Figure 5-13 Synchronized Canvas

6 REVISION HISTORY

Date	Revision	Description
2021.10.14	1.00	<ul style="list-style-type: none"> Release primary version.
2021.12.10	1.01	<ul style="list-style-type: none"> Supported the save and load project feature. Supported the generate header file feature. Added supported micro controller: <ul style="list-style-type: none"> NuMicro M23 Family: M258 Series.
2022.01.26	1.02	<ul style="list-style-type: none"> Supported the info area feature. Supported the warning dialog feature.
2022.03.07	1.03	<ul style="list-style-type: none"> Improved performance and GUI.
2022.05.20	1.04	<ul style="list-style-type: none"> Added supported micro controller: <ul style="list-style-type: none"> NuMicro 8051 Family: ML56 Series. NuMicro M23 Family: M2354 Series. Enhanced stability.
2022.06.01	1.05	<ul style="list-style-type: none"> Supported the conversion table feature. Supported the copy and paste feature.

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