NuMicro® Family
32-bit Microcontroller

Font Architect
User Manual

For additional information or questions, please contact: Nuvoton Technology Corporation.

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Table of Contents

List of Figures

1 BITMAP FONT GENERATOR

The Font Architect is developed based on AngelCode's great works "Bitmap Font Generator" and "AngelCode Tool Box" which are released under the liberal zlib license. All the core algorithm and frame works are unmodified and Font Architect utilized it to generate GUI_FONT structures defined by emWin in an ANSI C file. Manual creation of those fonts is possible, but since this would be very time-consuming and inefficient, it is recommended to use the Font Architect instead.

The tool does not come with any fonts or a permission or license to use any PC installed font for converting purposes. It is user's sole responsibility to not infringe upon any third party intellectual property right by making use of the fonts in its application and obtain a license if required by the legal owner of the font.

2 FONT ARCHITECT

The most popular font type in PC environments is TrueType font, which is an outline font standard developed by Apple and Microsoft. However, in embed operation systems, bitmap font is much adoptable due to low resolution limitation. This program will allow you to generate emWin fonts from TrueType fonts. The application generates both bitmap font arrays and pattern arrays that can be used by emWin API directly without any further modification for easy rendering of fonts on LCD display.

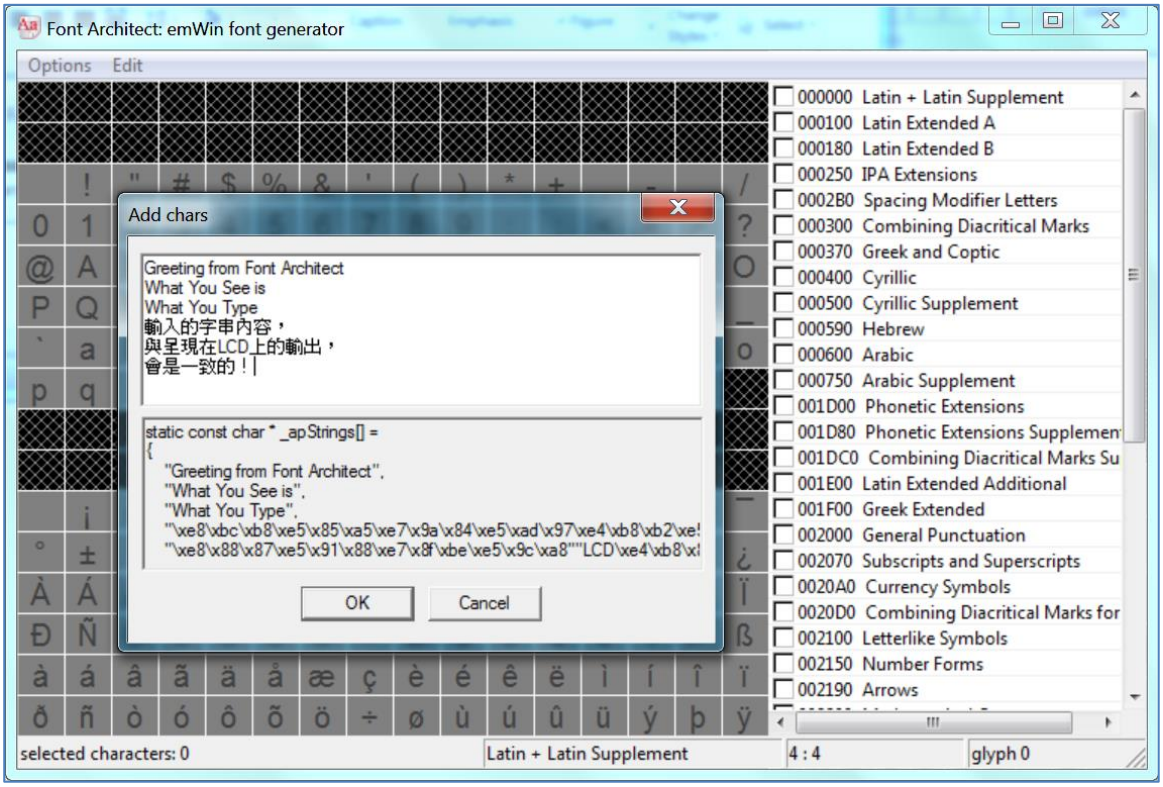

Figure 2-1 Font Architect Screenshot

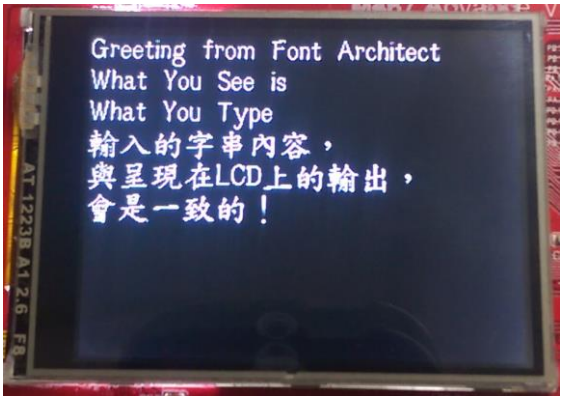

Figure 2-2 MCU/MPU emWin Demo Using “全字庫正楷體” Font

The basic procedure for using the Font Architect for creating an emWin font file from an installed Windows font or from the TrueType fonts files directly without installing them first. The steps are explained in detail in the following sections.

2.1 Starting the Application

As the Font Architect is started it immediately shows the "Font Settings" dialog box. The same dialog box appears if the Options/Font settings (F) is selected from the Font Architect menu bar.

Figure 2-3 Font Settings

2.2 Specifying the Actual Font

In the above screenshot, user can select a font, its style and size. The fonts shown in the Font selection list depend on MS Windows. In case user has a TrueType font file, it might be required to use “Add font file” to specify the file path and then use this as an installed font.
For rasterization options, please refer to the online documentation of BMFont.

We use the Chinese font “全字庫正楷體” do demo Font Architect. This font uses “The Open Government Data License” and is not included in our release.

Note: Fonts that are legally owned by third parties may require a valid license to use them in a target system. Nuvoton does not come with licenses for third party fonts.

2.3 Specifying the Type of Font

After confirming the "Font settings", the "Export Options" dialog is opened which allows user to select an emWin Font Type. The same dialog box appears if Options/Font settings (F) is selected from the Font Architect menu bar.

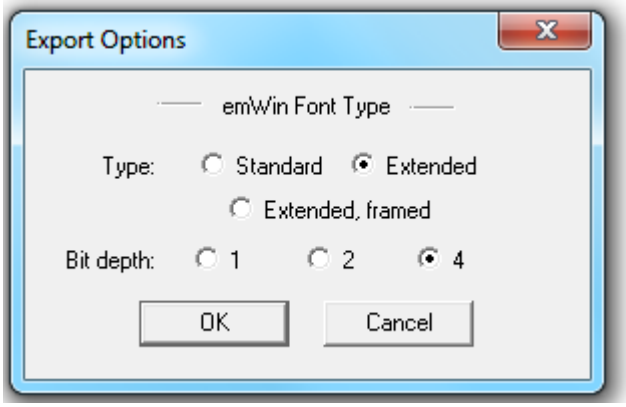

Figure 2-4 Export Options

Please refer to emWin document for further information. This document is included in the Nuvoton BSP and can be found in the following path “ThirdParty\emWin\Doc”.

Options	emWin Font Type
Standard + 1 Bit depth	GUI_FONTTYPE_PROP
Standard + 2 Bit depth	GUI_FONTTYPE_PROP_AA2
Standard + 4 Bit depth	GUI_FONTTYPE_PROP_AA4
Extended + 1 Bit depth	GUI_FONTTYPE_PROP_EXT
Extended + 2 Bit depth	GUI_FONTTYPE_PROP_AA2_EXT
Extended + 4 Bit depth	GUI_FONTTYPE_PROP_AA4_EXT
Extend, framed	GUI_FONTTYPE_PROP_FRM

Figure 2-5 emWin Font Type to GUI_FONTTYPE_XXXX

2.4 Selecting Characters from the Font

After confirming the “Export options ", the main window is opened which allows selection of characters supplied by the font. Left click on the list on the right side to switch to the specific Unicode code page, and then left click on the desired characters shown in the left window.

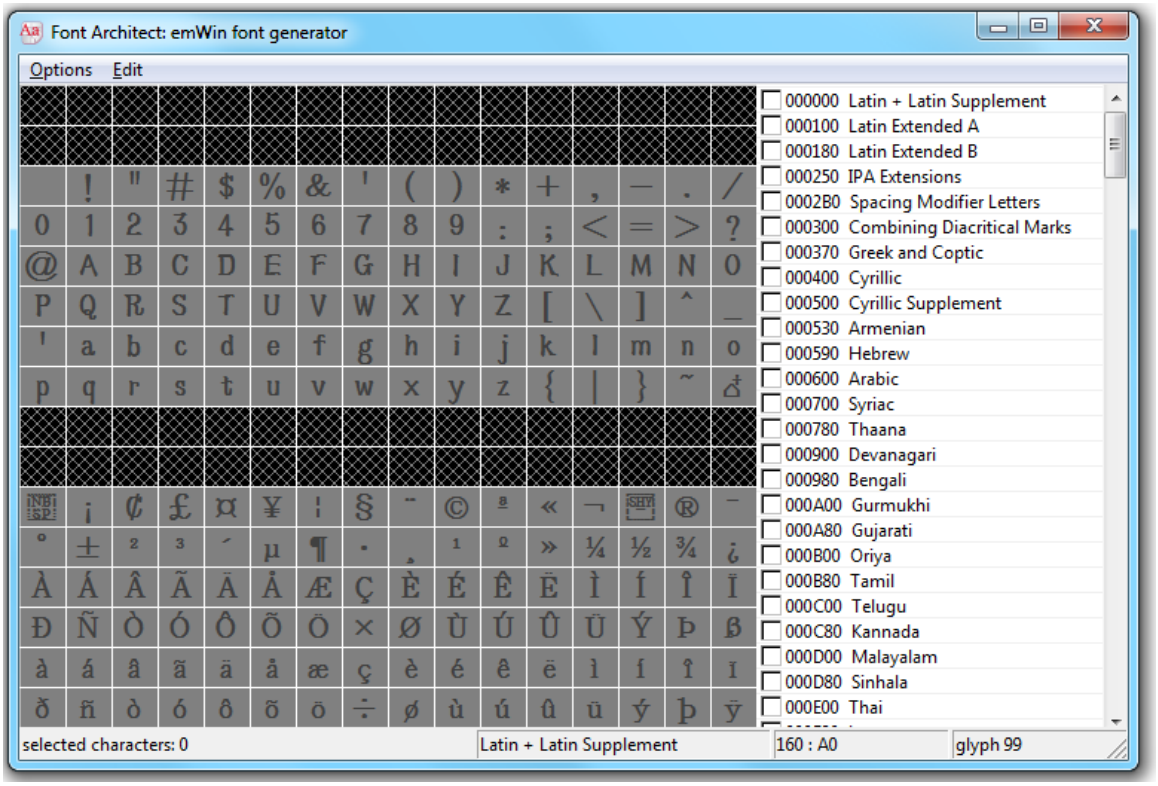

Figure 2-6 Main Window

2.5 Pattern Generation

The Font Architect provides another approach for user to select characters. Select Edit/Add chars from the menu bar to trigger “Add char” dialog as the following screenshot. Type or paste words in the first edit box to quickly select lots of characters. The UTF-8 string array generated from user input is displayed on the second edit window on the fly.

If the Warring message appears, please make sure the font selected as described in section 2.1 contains the characters. The following Warning notified that the eastern Asian characters is unavailable in Arial font.

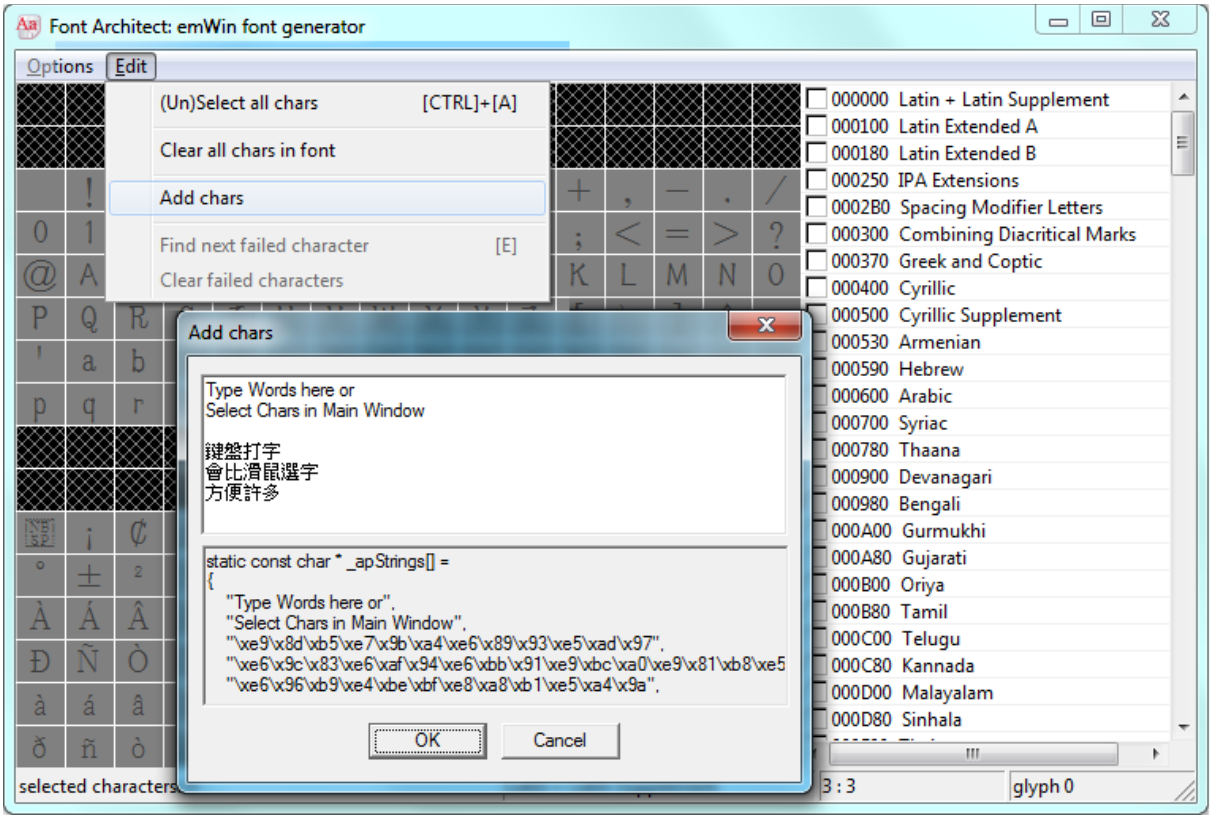

Figure 2-7 Add Chars Dialog

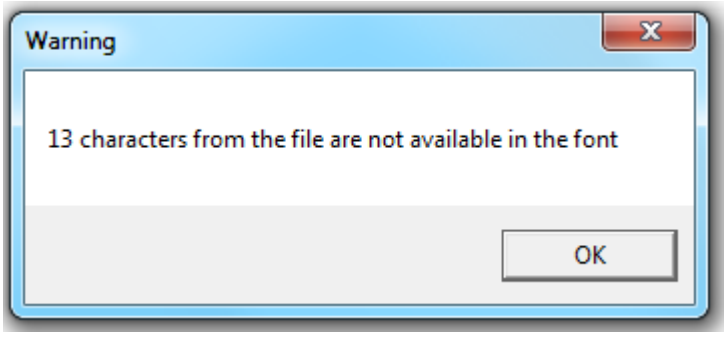

Figure 2-8 Warning about Unavailable Characters in Font

2.6 Saving the Font File

Selecting Options/Save bitmap font as... from the menu bar will open the "Save As" dialog, as shown below.

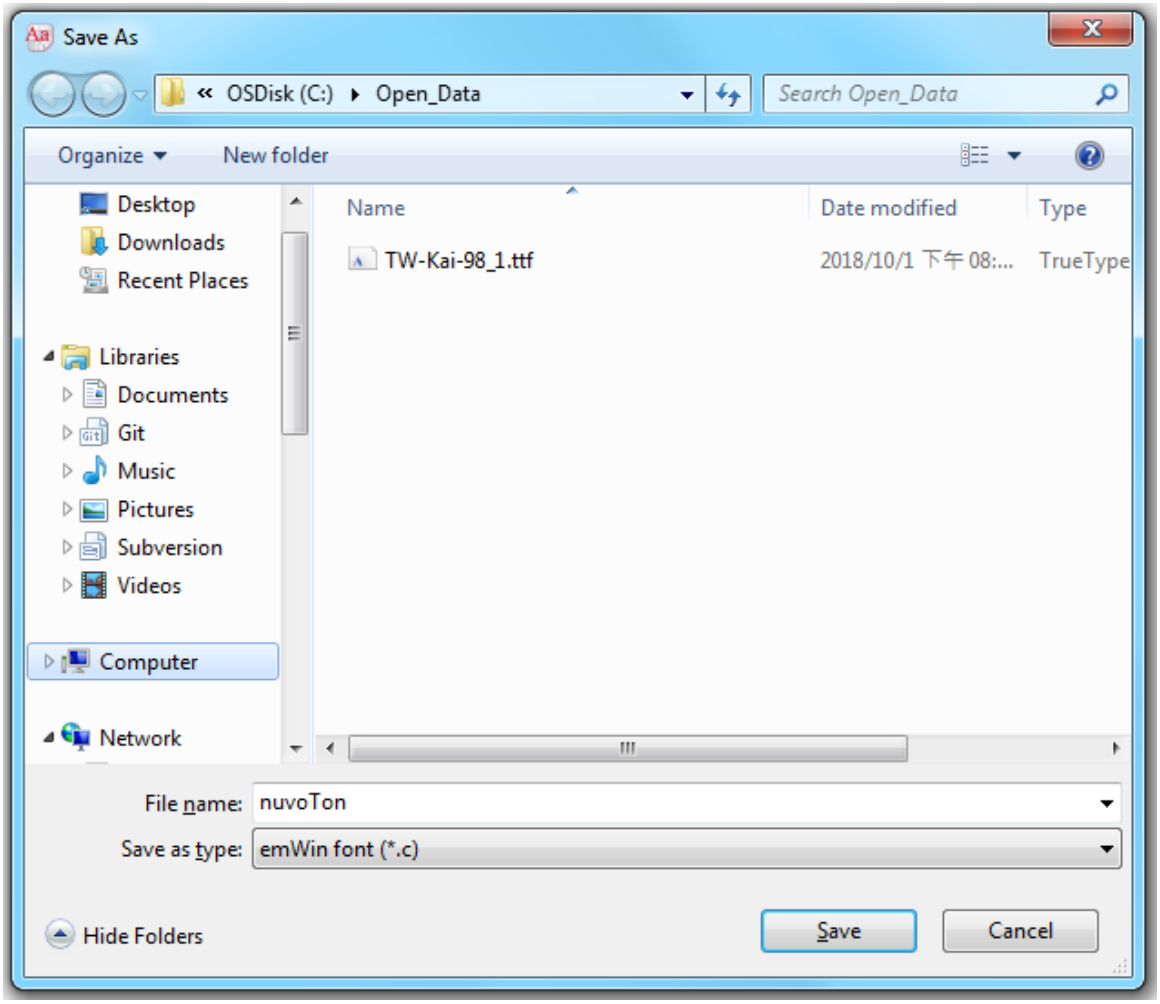

Figure 2-9 Save As Dialog

Clicking the "Save" button creates a font file at the current location using the specified file name. There is another pattern file with postfix "_demo" in file name. This pattern file with demo function is created according to section 2.5 Pattern Generation.

2.7 Results

The generated font file can be easily integrated into emWin based applications. Please refer to our BSP sample to get into the emWin world.

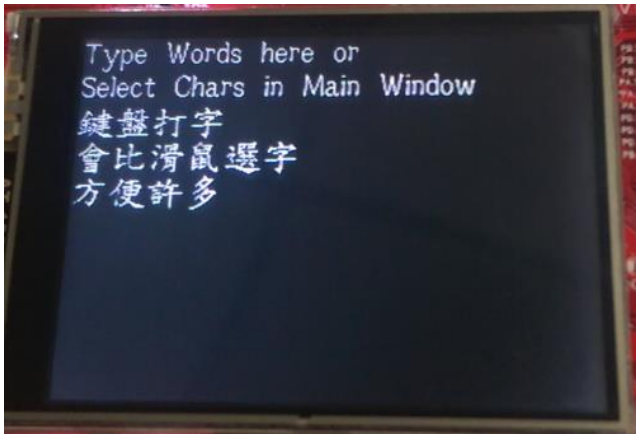

Figure 2-10 MCU/MPU emWin Demo Using “全字庫正楷體” Font Again

3 REVISION HISTORY

Date	Revision	Description
2019.01.14	1.02	1. Initial version.

Important Notice

Nuvoton Products are neither intended nor warranted for usage in systems or equipment, any malfunction or failure of which may cause loss of human life, bodily injury or severe property damage. Such applications are deemed, "Insecure Usage".

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