Introduction

mikroElektronika GLCD Font Creator

Version 1.2.0

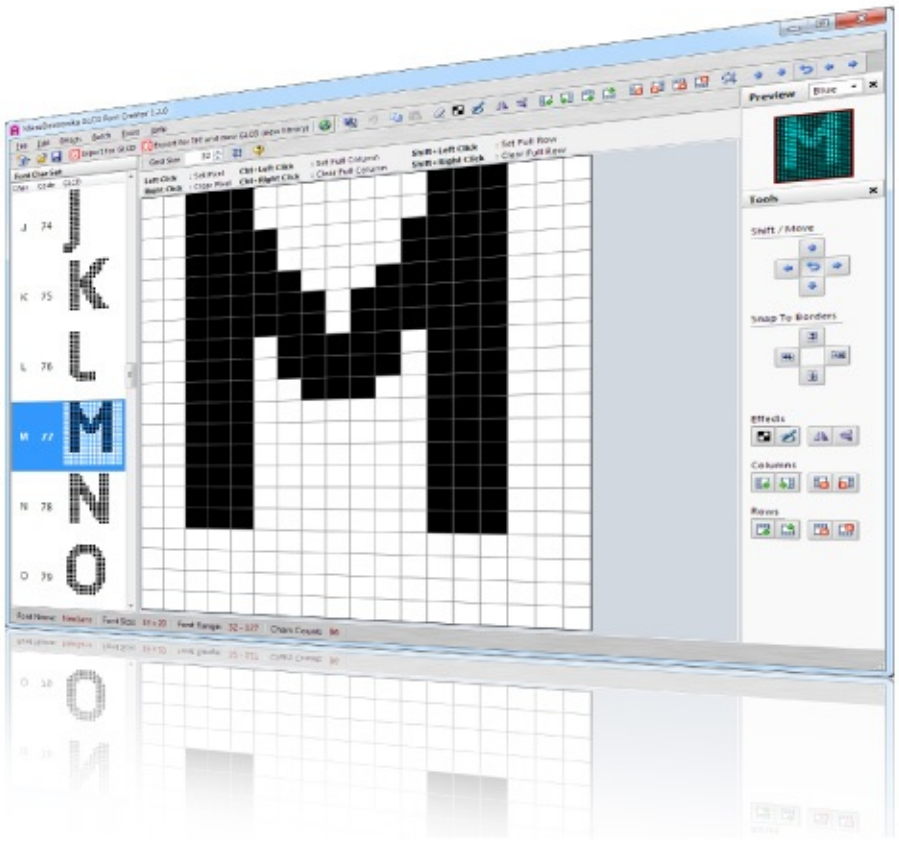
The ultimate Solution to Create Personalized Fonts, Symbols and Icons for Graphic LCD

GLCD Font Creator is the ultimate font creation utility for embedded systems. It lets you create fonts for Liquid Crystal Displays (**HD44780 LCD**) and **Graphics LCD**. It provides a very nice and intuitive user interface.

GLCD Font Creator lets you create fonts and symbols from scratch, or by

importing existing fonts on your system. **Unicode Fonts** are fully supported. It lets you modify and adjust them for your needs, apply effects to them, and finally export them as source code for use in your favorite language compiler.

Features



- Create Fonts, Symbols and Icons for Liquid Crystal Displays (LCD) and Graphic LCD from scratch.
- Create Fonts for your HD44780 alphanumeric LCD.
- Import Windows Fonts and instantly get ready fonts for your GLCD.
- Import of **UNICODE** Fonts and chars are supported.
- Modify chars for your convenience.
- Apply effects like video inversion, outlining, shifting,... to each char or automatically to the whole font.
- Very nice and intuitive user interface.
- Full support for MikroElektronika mikroBasic PRO, mikroPascal PRO and mikroC PRO compilers.

- Full X-GLCD Library (mikroPascal, mikroBasic and mikroC version) that enables large font support on MikroElektronika PRO compilers for all platforms (PIC, PIC32, dsPIC30/30 and PIC24, AVR and 8051).

Frequently Asqued Questions

What is MikroElektronika GLCD Font Creator?

MikroElektronika GLCD Font Creator is a tool to draw fonts and export them for MikroElektronika compilers.

Can I import the installed fonts on my PC?

Yes, you can create fonts using the funtionnality : "New Project : By Importing System Font".

What are all the compilers supported for export?

Actually, the supported compilers are **ALL MikroElektronika Pro compilers**, mikroBasic PRO, mikroPascal PRO, mikroC PRO, for **PIC, PIC32, dsPIC30/30 and PIC24, AVR and 8051**.

There are some useless white space above the characters, how to remove it?

It's easy. You can delete blanks on chars using Delete Row or Column function from any side of your chars. You can also use Automatic Optimisation Dialog to let GLCD Font Creator automatically do it for you.

Can I create fonts with variable chars width?

Yes of course. But in design time, all chars are the same width. At EXPORT TIME you can choose to export your fonts in FIXED font width or in PROPORTIONAL font width (in this later case, jump tables are

automatically computed and inserted in generated source code).

What is XGlcd Library?

In mikroBasic, mikroPascal and mikroC, GLCD Lib is the library that let users draw and paint on graphics LCD. This library is limited to painting texts on pages, i.e. on positions multiple of 8 pixels. This limitation is due to the hardware configuration of physical GLCDs. The second limitation is the fact that this lib is limited to fonts with a maximum of 8 pixels height. XGlcd Lib is breaks all these limitations. It's a wrapper arround MikroElektronika GLCD Lib. It let you draw fonts of any height at any pixel position on GLCDs.

When I use the XGlcd Lib the compiler also links the GLCD lib from MikroElekronika?

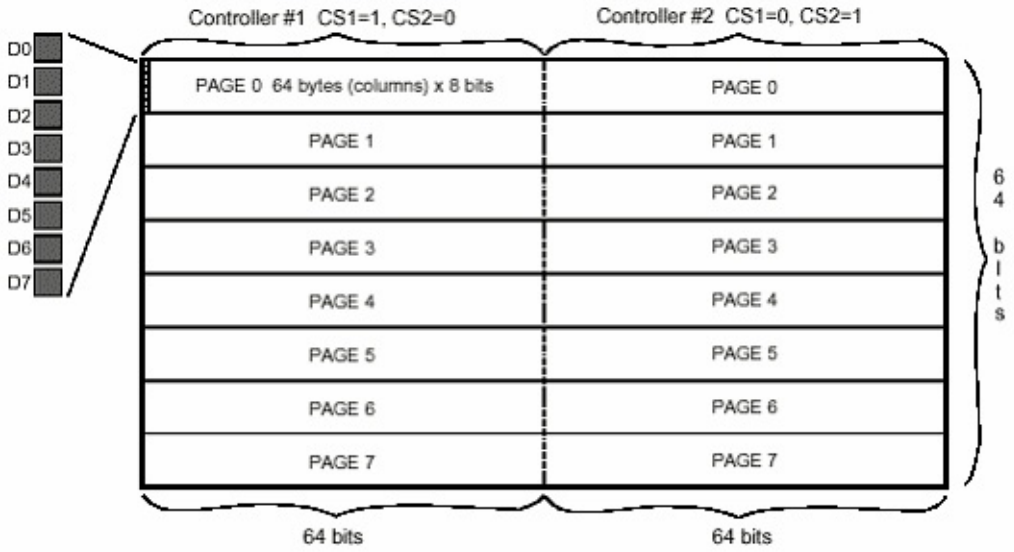
Yes, the XGlcd Lib is just a wrapper arround MikroElektronika GLCD Lib. A new rewrite of the full XGLCD lib is planned in order to improve its performances and make it at higher level of abstraction (no more hassle with managing physical pages and sides of GLCD).

X-GLCD Library

X-GLCD library for mikroBasic, mikroPascal and mikroC

Please read all details before using this library !!!

XGLCD library is aimed at providing a solution to break the limits of GLCD lib provided by MikroElektronika.
GLCD Lib is constrained by the physical structure of K0108/K0107 GLCD controllers. In these controllers, the screen is split on two sides.
You can think of a 128*64 LCD as a 1024 byte memory, every bit of which is visible. The display is split logically in half. It contains two controllers with controller#1(Chipselect1) controlling the left half of the display and controller#2 (Chipselect2) controlling the right half. Each controller must be addressed independently. Each half consists of 8 horizontal pages which are 8 bits (1 byte) high. The page addresses, 0-7, specify one of the 8 pages. That is illustrated in the drawing below.



Below are the KS0108 & HD61202 commands. These controllers do not have text capability and the commands are few and simple.

Instruction	RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	Function
Display ON/OFF	L	L	L	L	H	H	H	H	H	L/H	Controls the display on or off. Internal status and display RAM data is not affected. L:OFF, H:ON
Set Address	L	L	L	H	Y address (0~63)						Sets the Y address in the Y address counter.
Set Page (X address)	L	L	H	L	H	H	H	Page (0~7)			Sets the X address at the X address register.
Display Start Line	L	L	H	H	Display start line (0~63)						Indicates the display data RAM displayed at the top of the screen.
Status Read	L	H	BUSY	L	ON/OFF	RESET	L	L	L	L	Read status. BUSY L: Ready H: In operation ON/OFF L: Display ON H: Display OFF RESET L: Normal H: Reset
Write Display Data	H	L	Write Data								Writes data (DB0:7) into display data RAM. After writing intruction, Y address is increased by 1 automatically.
Read Display Data	H	H	Read Data								Reads data (DB0:7) from display data RAM to the data bus.

Y address (0-63Y address counter designates address of the internal DDRAM. An address is set by instruction and is increased by 1 automatically by read or write operations of display data. Y address 0 is the leftmost bayt, and Y address 63 is the rightmost byte of a page.

X address (0-7): This is the page address and has no count function.

Display start line (0-63): The display start line register specifies the line in RAM which corresponds to the top line of LCD panel, when displaying contents in display data RAM on the LCD panel

The GLCD Lib from MikroElektronika let you:

1- Choose a font with a height of 8 bits at maximum because of the hardware driver pages.

2- Write only at pages level (8 pages = 8 lines), so you cant write for example a string at pixel 3 from top edge (Y = Multiple of 8).

X-GLCD lib breaks all these limitations. It let you

1- simply write any font,

2- with any size (any height, even bigger than 8 bits)
3- at any Pixel Position with transparency (Y has NOT to be multiple of 8)

Understand the Export Filter for mikroBasic, mikroPascal and microC:
This filter let you convert any font you created (even from scratch or imported an existing Windows font) to constant tables needed by MikroElektronika compilers.

This filter is easy to use, just select the tab corresponding to your favorite language (mikroBasic, mikroPascal or mikroC) and the source code is automatically generated for you.

BUT !!!!!!!!!!!!!!!!

Fonts Bigger thant 8 bits height:
For fonts Bigger than 8 bits (height): The use of X-Glcd Library is mandatory to be able to draw them on GLCD (see X-GLCD section for usage guide).

For fonts with height less or equal to 8 bits:
These fonts can be rendered using either MikroElektronika GLCD lib, or X-GLCD lib. GLCD lib is a bit quicker than X-GLCD lib when rendering these fonts.

So Why use X-GLCD lib with fonts with height less or equal to 8 bits ?
Simply because
1- X-GLCD lib let you draw these fonts at any PIXEL position from top and not only at Y positions multiple of 8 bits (pages)

2- X-GLCD lib renders fonts with PROPORTIONAL char width

X-GLCD lib usage guide:

X-GLCD lib provide 3 procedures very similar to the original GLCD Lib provided by MikroElektronika.

xGLCD_Set_Font()
xGLCD_Write_Char()
xGLCD_Write_Text()

the parameters are absolutely the same as GLCD lib equivalent functions/procedures.

IMPORTANT NOTES :

1- The Coordinate system is not the same as GLCD lib from MikroElektronika !
2- Fonts used by GLCD Lib are not compatible with XGLCD lib !

X-GLCD lib aims at hiding the physical structure or hardware GLCD. So the big difference between X-GLCD and GLCD is the fact that for coordinates (X, Y) passed as parameters to each procedure (xGLCD_Write_Char() and xGLCD_Write_Text()) are the logical coordinate you want to use on the screen. That means that the X coordinate is between 0..127 and the Y coordinate is between 0 to 63.

If you want to write a char at position X=69 and Y=72 you have only to call

xGLCD_Write_Char(myChar, 69, 72)

With X-GLCD Lib You do not have to worry about pages or sides. All is done automatically for you.

The future of XGLCD lib:

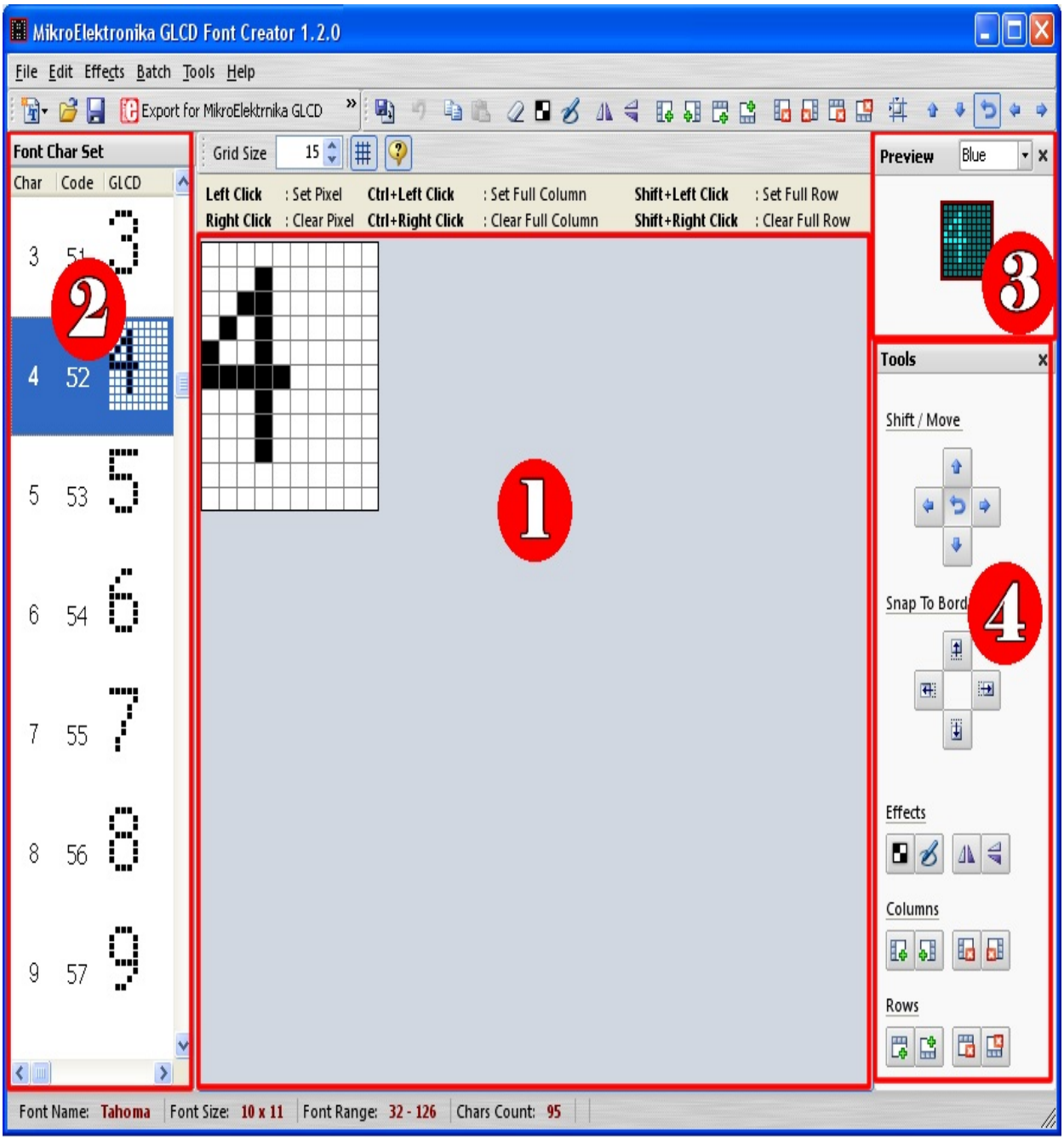
A full rewrite of XGLCD lib is planned (may be in pure ASM) to make it more user friendly and more quicker. The fonts needed by XGLCD lib will contain pre-computed jump tables so that only really use bytes in each char are stored in the table, this will compress the font tables by more than 50% and make selection of chars quicker.

Support of Bitmaps, icons and symbols drawing will also be added.

The new XGLCD lib will not be based on GLCD Lib. It will be really standalone and will offer functions for Lines, polygons, and other stuff. Also, addressing the hardware registers of the graphical controller will make it really quicker.

User Interface

GLCD Font Creator has a very nice and intuitive interface.



The main screen is split in 4 major zones. Almost all zones are moveable and can be disposed as you find it useful for your usage.

Zone 1 : Char Editor zone.
Zone 2 : The list of chars in the currently edited font.
Zone 3 : The currently edited char LCD Viewer.
Zone 4 : The tools panel contains the most used tools.

Export Filters

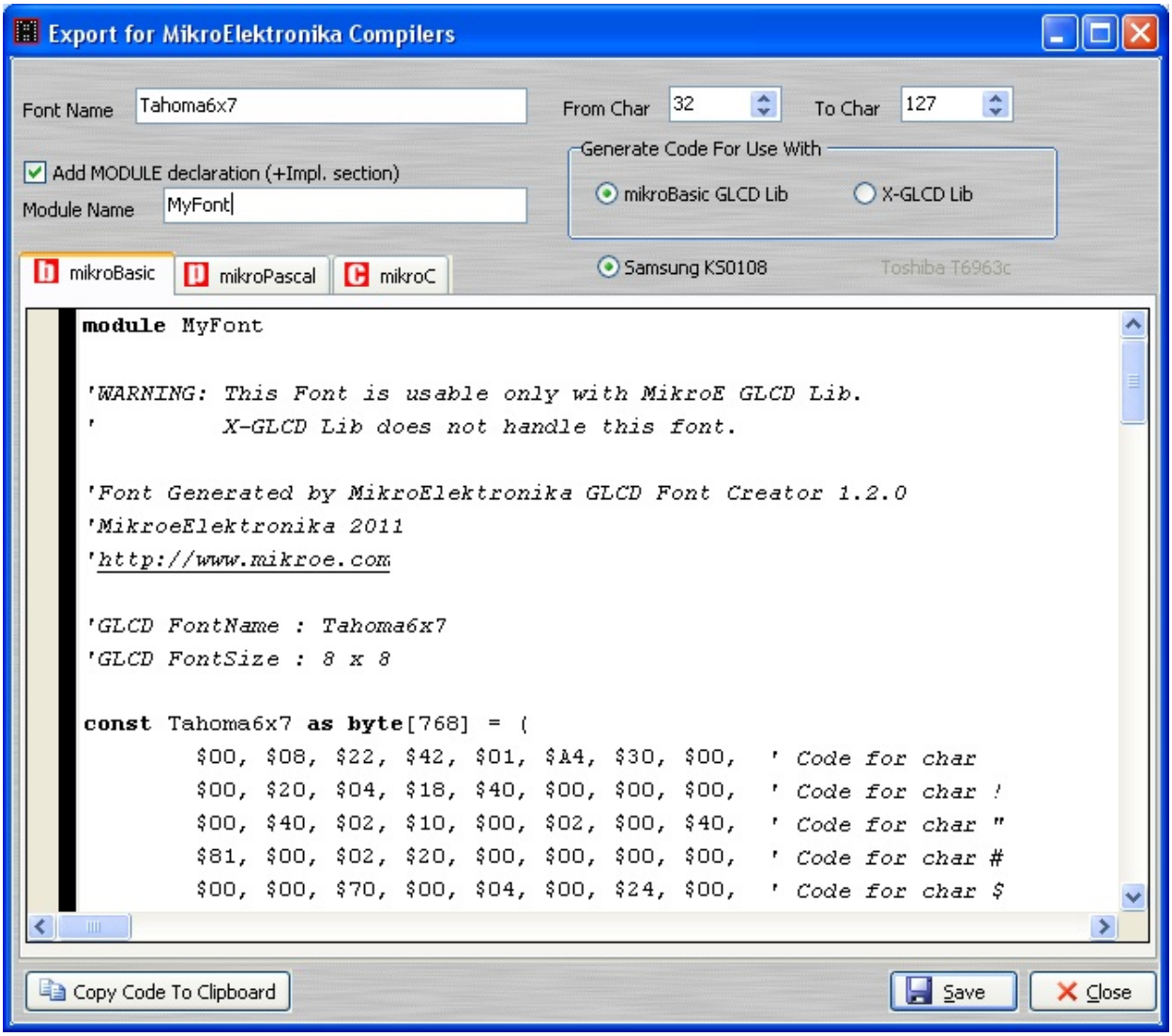
Export filters let you export your fonts in source code format to be used in Mikroelektronika compilers.

mikroBasic, mikroPascal and mikroC filter

The MikroElektronika compilers' target filter let you export fonts in a format compatible with mikroBasic, mikroPascal and mikroC.
This filter is directly related to X-GLCD library. **Please read the topic related to X-GLCD lib fully to understand fully this filter.**

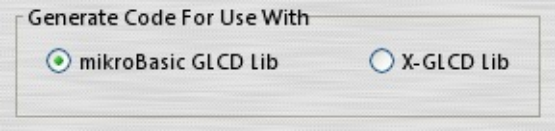
Fonts with 8 bits height or less :

Mikroelektronika GLCD lib handles only fonts with 8 bits height. So when your font is 8 bits or less in height, invoquing the filter for MikroElecktronika compilers will show the folowing screen.



In this screen, you have only to choose the target compiler (language), to specify the range of chars to export and eventually the module/unit name to add to source code.
Generated source code can be copied to clipboard and pasted in your compiler IDE, or can be saved directly to disk.

The most important thing to note in this screen is the group of radio "**Generate Code For Use With**"

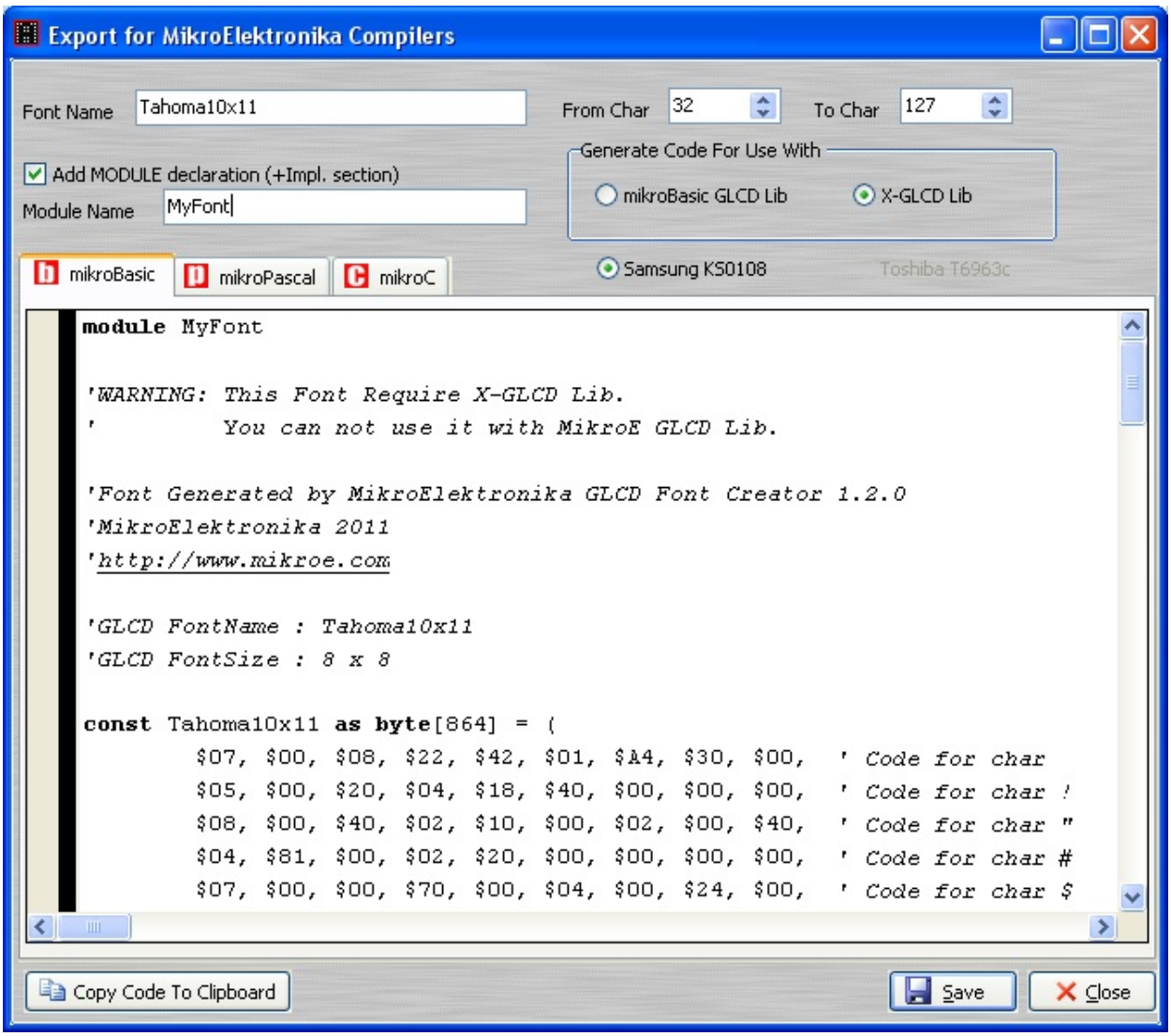


miroBasic (or mikroPascal or mikroC) GLCD Lib : creates fonts compatible with MikroElektronika GLCD Library.
X-GLCD Lib : creates fonts compatible with X-GLCD Library.

The useful thing to note about X-GLCD lib is that it let you draw fonts at any Y position on the screen and not only at positions with Y is a multiple of 8 (because of the physical structure of GLCD hardware).

Fonts with height bigger than 8 bits:

GLCD library from MikroElektronika is unable to handle these fonts. X-GLCD lib was written specially to handle them, and thus is the only option possible.



Please read the topic related to X-GLCD lib fully to understand fully this filter.

Technical Support

In case you encounter any problem, you are welcome to our support forums at www.mikroe.com/forum/. Here, you may also find helpful information, hardware tips, and practical code snippets. Your comments and suggestions on future development of the MikroElektronika GLCD Font Creator always appreciated — feel free to drop a note or two on our Wishlist.
In our Knowledge Base www.mikroe.com/en/kb/ you can find the answers to Frequently Asked Questions and solutions to known problems. If you can not find the solution to your problem in Knowledge Base then report it to Support Desk www.mikroe.com/en/support/. In this way, we can record and track down bugs more efficiently, which is in our mutual interest. We respond to every bug report and question in a suitable manner, ever improving our technical support.

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