



C++ Software Development Kit

How to Use StarIO in C++ for Mac OS X

Thermal Line Mode Printing

This SDK contains a C++ no IDE and an Xcode project for use on Apple Mac OS X.

Compatible Star Micronics Printer Models:

- FVP10 (Ver.1.0 or later)
- HSP7000 (Ver.1.0 or later)
- TSP650II (Ver.1.0 or later)
- TSP700II (Ver.2.0 or later)
- TSP800II (Ver.1.0 or later)
- TSP800Rx (Ver.4.3 or later)
- TUP500 (Ver.1.0 or later)
- TUP900 (Ver.1.2 or later)
- mPOP (Ver.1.0 or later)

Supported Interfaces:

- USB
- Ethernet
- Bluetooth
 - TSP650II(Ver.1.0 or later)
 - TSP700II(Ver.5.0 or later)
 - TSP800II(Ver.2.0 or later)
 - FVP10(Ver.2.0 or later)

Functions Include:

- Print Sample Receipt
- All 1D Barcodes
- All 2D Barcodes
- Change Font
- Cut
- Feed
- Code Pages
- Getting Status

Requirements: Apple Mac with OS X or higher plus an installed copy of Xcode 5.0 or higher.

NOTE:

- This sample program contains StarIO components from StarIO Version 2.2.1. Details of StarIO(Restrictions, Precautions) are found in the manuals located here:
English : <..\StarIO_help\en\StarIO\index.htm>
Japanese : <..\StarIO_help\ja\StarIO\index.htm>
- This sample program provides source code and executables.
- If you do not have Xcode installed, you can use your Mac OS X DVD to install Xcode on your system.
- When you upload an application that uses StarIO to Mac APP Store, please add a signature to StarIO again.




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About this Manual

This manual is designed to help you understand StarIO and how to build a C++ application to interact with Star Micronics Thermal Line Mode Printers. It is important to understand the basics of the C and C++ language. Although this SDK is for the programming language C/C++, there are other SDKs available at our website in the Developers section. Check the Developers section of our site for the newest SDKs, technical documentation, FAQs, and much more additional resources.

Key Legend:

<i>Warning</i>		Explains potential issues
<i>Avoid Doing This</i>		Explains things not to do
<i>Note</i>		Provides important information and tips

CAUTION:

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How to compile and run the C++ SDK

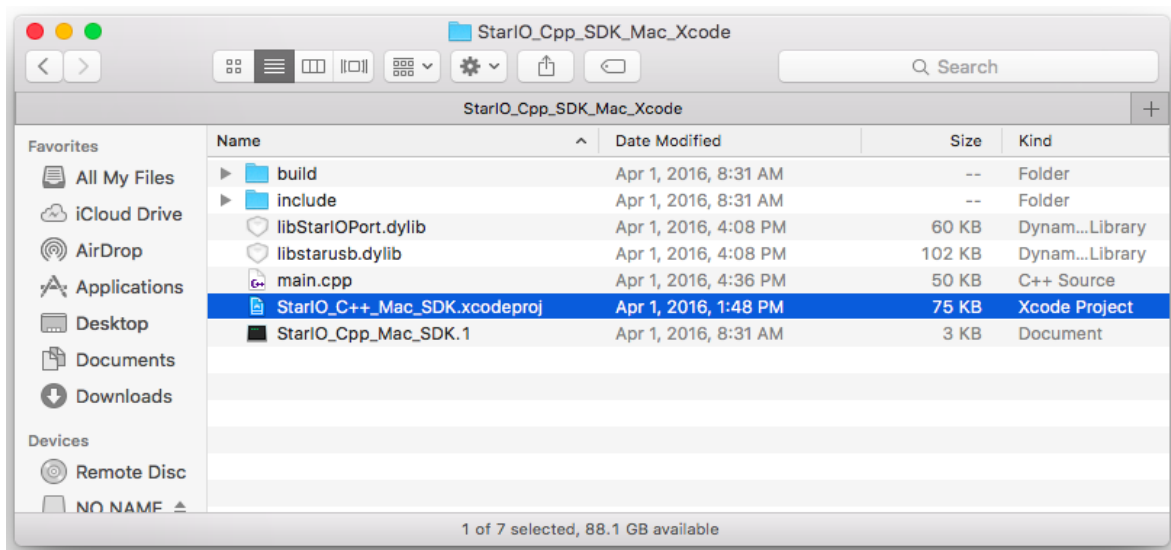
This section will explain:

1. How to open the Xcode C++ SDK project.
2. Compiling the project.
3. Running the project.

How to open the SDK project:



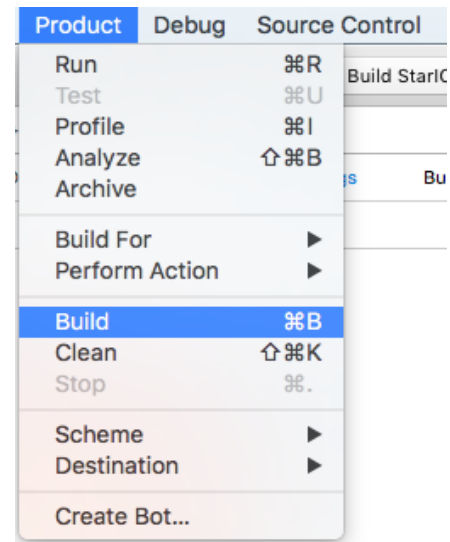
1. Open the finder.



2. Open [StarIO_Cpp_SDK_Mac_V110\Software\StarIO_Cpp_SDK_Mac_Xcode\
StarIO_C++_Mac_SDK.xcodeproj]

Compiling the project:

Click on the menu item “Product” and then click “Build”. If errors occur, click clean and then build again.

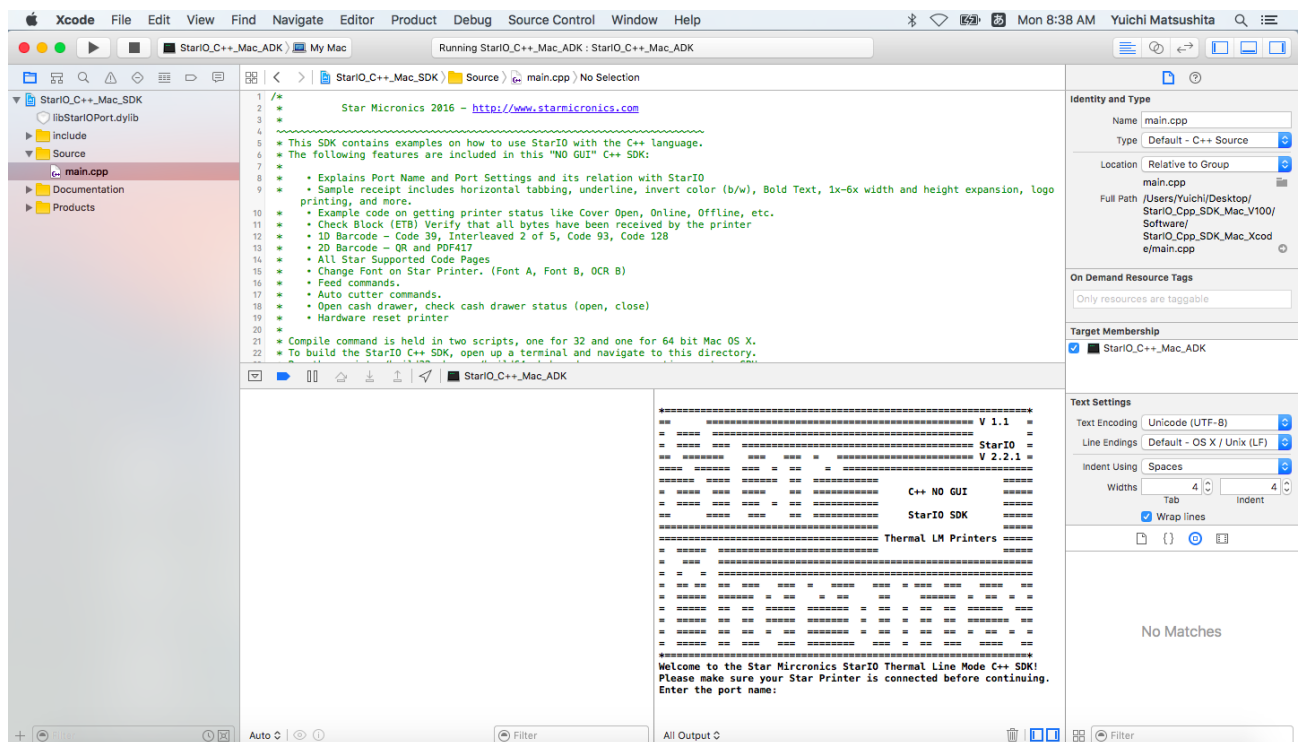


How to build the C++ project

Running the project:

Click on the menu item “Product” and then click “Run”

This will launch the debugger:



Using the SDK with Star Micronics Printers

Please make sure you have a compatible Star Micronics Thermal Line Mode Printer model.

Port Name and Interface Relation:

StarIO uses specific port names to identify what port will be used. These are very important to understand because not following the naming convention correctly will fail to communicate with the printer.

Interface	Port Name	Port Settings
USB (Vendor Class)	usbven:	N/A
USB (Printer Class)	usbprn:"Queue Name" or usbprn:"USB serial number"	N/A
Ethernet (TCP/IP)	tcp:"IP Address"	N/A
Bluetooth	/dev/tty.XXXXXXXX-SPP	N/A

USB - Printer Class

Two different port name parameter forms are accepted.

1. Do not specify the port name

The port name parameter is formed by combining "usbprn:" with your printer's model name. For example, when you want to specify a model name as "TSP743II", you may create it as:

"usbprn:TSP743II"

2. Specifying USB serial number

"usbprn:XXXXXXX"

*XXXXXXX = your specifying USB serial number

***Note:** Star's printers do not have USB serial numbers configured from the factory default. You will have to write a serial number into the device in order to use this functionality.*

USB - Vendor Class

A Port number is not required. Just put "usbven:" as the Port Name.

Ethernet (TCP/IP)

"tcp:192.168.222.244" Enter TCP IP Address of the Ethernet printer.

Bluetooth

Pairing with the printer device in advance. Also after pairing, make sure that as following. At "Terminal", perform the following command.

Is /dev/ | grep "tty\."

(Check a device file which is "/dev/tty.XXXXXXXX-SPP" (XXXXXXX is string.))

When you first launch the application in the console, you will be asked for a port name and port settings. Please review the above Port Name choices you can use that will connect to your Star Printer.

```
= ===== =
= ===== =
*=====*
Welcome to the Star Micronics StarIO Thermal Line Mode C++ SDK!
Please make sure your Star Printer is connected before continuing.
Enter the port name: usbven:
Enter the port settings:
MAIN MENU
[c] Communication Setup
[1] Print Sample Receipt
[2] Get Parsed Status
[3] Checked Block (ETB)
[4] 1D Barcodes
[5] 2D Barcodes
[6] Code Pages
[7] Fonts
[8] Feed
[9] Auto-Cutter
[10] Kick Cash Drawer
[11] Reset Printer
[x] Quit
Select one of the above options: █
```

Shows user entering "usbven:" for a USB Vendor Class Star Printer.

After you enter in connection details for your printer, you will be greeted with a menu to perform Star commands. Have some fun with this and try different choices to fully exercise this SDK's functionality.

To change the printer connection settings, you can hit "c" and then "Enter" to return to the Port Name and Port Settings input screen.

To quit you can put "x" and hit "Enter" or any one of the choices shown in the above menu.

Overview of how the C++ SDK is designed

This overview will touch briefly on key components of the SDK and how to find them.

Focus on the file “main.cpp” which contains all the business logic and StarIO commands.

The project has a Mac library file called libStarIOPort.dylib which is a library for StarIO commands and communication with the printer that can be used with any Mac C++ app. Include this file into your application in order to expose StarIO and its methods to your program.

Look through the code for comments and you will see how easily it is broken down step by step for you. Almost all functions in this SDK have comments above to explain what the function and code is doing.

If you would like to quickly find a snippet of code that this application performs, use Xcode to do a FIND on the particular command you wish to know. For example to find the 2D Barcode commands, click Edit->Find->Find In Project to open the Find and Replace window. Type in “2D Barcode” and find the declaration of where the function begins.

StarIO - (libStarIOPort.dylib)

How to include StarIO into your project:

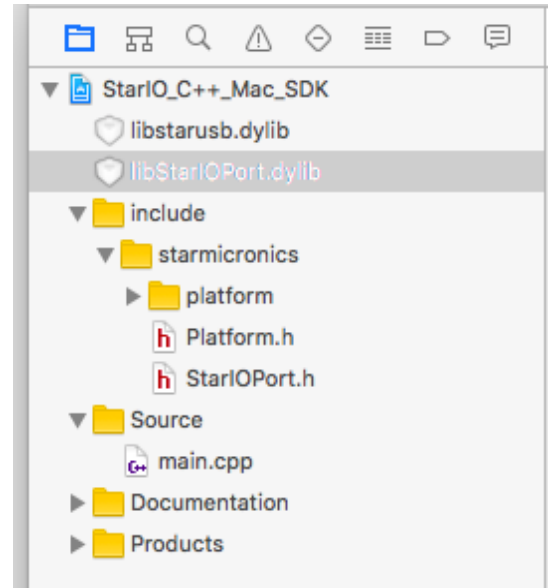
The file libStarIOPort.dylib is a dynamically linking library that you can include into your C++ projects to expose StarIO methods in Mac. The file StarIOPort.h is a header to expose the functions of this library and must be used with Platform.h and Mac.h.

To include this lib into your project:

1. Open up your Main code
2. At the very top of your code where your includes are, place the following line:

`#include "StarIOPort.h"`

3. Now open up this SDK and open the "bin".
4. In this folder you will see libStarIOPort.dylib
5. Copy and paste this file to your project's output directory "bin/Debug" or "Release".
6. Now go back to the SDK and copy the directory "starmicronics" and paste this into your project folder.
7. Now you can access all of StarIO's methods!



StarIO being used as a Reference



WARNING: Make sure libStarIOPort.dylib resides along with your program as it will need this to execute StarIO communication with our POS Printers. The files "Platform.h", "Mac.h", and "StarIOPort.h" are needed in your code if you wish to use our variable typing based in the Mac include file.

Functionality

StarIO Printer Commands

All of these commands can be found in the [Star Thermal Line Mode Spec Manual](#).

The C++ SDK also has page and section references to this document for more information so please download that manual and study it if you need more detail on a specific command.

1D Barcodes

```
1D BARCODES
ASCII: ESC b n1 n2 n3 n4 d1 ... dk RS
HEX:   1B 62 n1 n2 n3 n4 d1 ... dk 1E

n1 = Barcode type
n2 = Layout
n3 = Barcode size selection
n4 = Barcode Height (In Dots)

1D BARCODES MENU
[1] Code 39
[2] Interleaved 2 of 5
[3] Code 93
[4] Code 128
[0] Back to Main Menu
Please choose a barcode to print: _
```

n1 = Barcode Type

- 0 = UPC-E
- 1 = UPC-A
- 2 = JAN/EAN8
- 3 = JAN/EAN13
- 4 = Code39
- 5 = ITF
- 6 = Code128
- 7 = Code93
- 8 = NW-7

n2 = Under-bar character selection and added line feed selection

- 1 = No added under-bar characters & Executes line feed after printing barcode
- 2 = Adds under-bar characters & Executes line feed after printing barcode
- 3 = No added under-bar characters & doesn't line feed after printing barcode
- 4 = Adds under-bar characters & doesn't line feed after printing barcode

n3 = Barcode mode selection specifies the size of the narrow and wide barcode lines

n4 = Barcode height (dot count)

2D Barcodes

QR Codes

```

2D BARCODES MENU
[1] QR Code ~ Step 1 ~ Set Model
[2] QR Code ~ Step 2 ~ Set Correction Level
[3] QR Code ~ Step 3 ~ Set Cell Size
[4] QR Code ~ Step 4 ~ Set Barcode Data
[5] QR Code ~ Step 5 ~ Print QR Code
[6] QR Code ~ Do All Steps

```

There are 5 commands below that are very important to printing a good QR code.

- | | |
|----------------------------------|--------------------------------|
| (1) Set QR Code Model # | ESC GS y S 0 n |
| (2) Set QR Code Correction Level | ESC GS y S 1 n |
| (3) Set QR Code Cell Size | ESC GS y S 2 n |
| (4) Set QR Code Data | ESC GS y D 1 NUL nL nH d1...dk |
| (5) Print the QR Code | ESC GS y P |

Here is the order in which commands need to be sent to the printer for it to print the QR code.

QR model + QR Correction Level + QR Cell Size + QR Data + Print QR Code

PDF417

```

[7] PDF 417 ~ Step 1 ~ Set Size
[8] PDF 417 ~ Step 2 ~ Set ECC (Security Level)
[9] PDF 417 ~ Step 3 ~ Set X-Dimensions
[10] PDF 417 ~ Step 4 ~ Set Aspect Ratio
[11] PDF 417 ~ Step 5 ~ Set Data
[12] PDF 417 ~ Step 6 ~ Print PDF 417
[13] PDF 417 ~ Do All Steps
[m] Back to Main Menu
Please choose a 2D Barcode Command:

```

Please visit page 3-120 in the Line Mode Spec Manual for more details on PDF417

- | | |
|--|-------------------------------|
| (1) Set PDF417 barcode size | ESC GS x S 0 n p1 p2 |
| (2) Set PDF417 ECC (Security Level) | ESC GS x S 1 n |
| (3) Set PDF417 module X direction size | ESC GS x S 2 n |
| (4) Set PDF417 module aspect ratio | ESC GS x S 3 n |
| (5) Set PDF417 barcode data | ESC GS x D nL nH d1 d2 ... dk |
| (6) Print PDF417 barcode | ESC GS x P |

Here is the order in which commands need to be sent to the printer for it to print the PDF417.

PDF417 Size + PDF417 ECC + PDF417 X-dim + PDF417 Ratio + PDF417 Data + Print PDF417

Change Font

Changing the font on the printer can be done with the following commands.

ESC RS F n n = 0 for A, 1 for B, 10 for OCR-B

```

FONTS:
[1] Set Font A
[2] Set Font B
[3] Set Font OCR-B
[m] Back to Main Menu
Please choose a font to set the printer to: _

```

Feed

The feed commands are very straight forward. Use LF for best results.

```

FEED:
[1] Line Feed A
[2] Set Line Feed to 4mm
[3] Set Line Feed to 3mm
[4] Multi Line Feed
[5] Set Line Spacing to 3mm
[6] Feed 4mm Multi Lines
[7] Feed 8mm Multi Lines
[8] Form Feed
[m] Back to Main Menu
Please choose a feed command to use: _

```

Cut

```

AUTOCUTTER:
[1] Full Cut
[2] Partial Cut
[3] Feed and Full Cut
[4] Feed and Partial Cut
[m] Back to Main Menu
Please choose a cut command to execute: _

```

Partial Cut ESC d 1 or 3

Full Cut ESC d 0 or 2

Code Pages

To set a code page on the printer:

ESC GS *t* *n*

n = The Code Page Selection Index

```
CODE PAGES:
[1] Normal
[2] 437 <USA, Std. Europe>
[3] Katakana
[4] 437 <USA, Std. Europe>
[5] 858 <Multilingual>
[6] 852 <Latin-2>
[7] 860 <Portuguese>
[8] 861 <Icelandic>
[9] 863 <Canadian French>
[10] 865 <Nordic>
[11] 866 <Cyrillic Russian>
[12] 855 <Cyrillic Bulgarian>
[13] 857 <Turkey>
[14] 862 <Israel <Hebrew>>
[15] 864 <Arabic>
[16] 737 <Greek>
[17] 851 <Greek>
[18] 869 <Greek>
[19] 928 <Greek>
[20] 772 <Lithuanian>
[21] 774 <Lithuanian>
[22] 874 <Thai>
[23] 1252 <Windows Latin-1>
[24] 1250 <Windows Latin-2>
[25] 1251 <Windows Cyrillic>
[26] 3840 <IBM-Russian>
[27] 3841 <Gost>
[28] 3843 <Polish>
[29] 3844 <CS2>
[30] 3845 <Hungarian>
[31] 3846 <Turkish>
[32] 3847 <Brazil-ABNT>
[33] 3848 <Brazil-ABICOMP>
[34] 1001 <Arabic>
[35] 2001 <Lithuanian-KBL>
[36] 3001 <Estonian-1>
[37] 3002 <Estonian-2>
[38] 3011 <Latvian-1>
[39] 3012 <Latvian-2>
[40] 3021 <Bulgarian>
[41] 3041 <Maltese>
[~] Back to Main Menu
Please choose a Code Page to Print Character Map: _
```

Getting Parsed Status of the Printer

```
Current status of the Star Printer:
Online.
Drawer Closed.
```

The SDK also has functions for a full sample receipt which shows how to do text formatting. You can also kick the cash drawer and reset the printer.

Tips for App Development when using StarIO

Star Micronics prides itself as the industry leader in great POS products and with great power comes great responsibility. Below is a tips section just to help you get on the fast track to software development with StarIO.

TIP #1: If you are going to be coding a large project, create a class to abstract all the printing methods into class(s) instead of having the code reside in the main code block. This will help with code reusability and will also save you time in the long run from having to find one line of code in the main code. By having StarIO only reside in the class(s), you will be fully taking advantage of object oriented programming.

TIP #2: Know what the differences and definitions of (ASCII & Unicode), (Hex & Decimal), and (Byte & Char) are. A byte is normally 8-bits long which would be 8 digits of binary (1s and 0s). These bytes are just 8 bits of binary data but bytes can also be int or char. The three different variable types basically hold the data in the same way but there are slight differences. Try to code with Bytes instead of Chars, ints, or strings when choosing a variable to contain your print job data. ASCII to Unicode and vice versa conversions are sometimes unsecure so make sure you know what and how the encoding class works with these. Big mistakes made in Unicode are culture-sensitive search and casing, surrogate pairs, combining characters, and normalization.

TIP #3: Do not waste time trying to reverse engineer StarIO command codes. All the available StarIO commands are available in the Thermal Line Mode Spec Manual and that is the best resource to use when researching a specific StarIO command. This SDK & Manual was built to help you (The Developer) have a very easy job ahead of you to program for Star Printers.

TIP #4: If there is a command that is not covered in this SDK but you wish to see a code snippet of that command in use then visit our Developers' section for a possible code block that matches your needs.

TIP #5: Looking for an Android printing SDK? Visit our [Developers section](#) to get access to Star developer tools for these environments.

Additional Resources

This section will share resources that will help you develop good software with StarIO.

Please get the programmers manual for Star Portable Printers from the link below.

[Star Micronics Developers Network](#)

Browse Star Micronics' FAQs, look up information, etc.

The Developers Network gets you access to:

- Updated Versions of this Manual and Source Code
- Getting Started Advice and Industry Information
- Star Micronics Printer Drivers
- Technical Questions/Support

[Apple Developer Site](#)

The official Apple development resource.

[Apple Developer Site Resources](#)

Peruse Apple's library of documentation for developers.

[Unicode.org](#)

The Unicode Consortium - Good place to learn more about Unicode.

[1D Barcodes](#)

Barcode Island is a great resource for specs on 1D barcodes.

[2D Barcodes](#)

Great place for information on 2D Barcodes, [QR Codes](#), and [PDF417](#)

[Code Pages](#)

Learn about Code Pages here.

ASCII Table Resource

ASCII Hex Symbol	ASCII Hex Symbol	ASCII Hex Symbol	ASCII Hex Symbol
0 0 NUL	16 10 DLE	32 20 (space)	48 30 0
1 1 SOH	17 11 DC1	33 21 !	49 31 1
2 2 STX	18 12 DC2	34 22 "	50 32 2
3 3 ETX	19 13 DC3	35 23 #	51 33 3
4 4 EOT	20 14 DC4	36 24 \$	52 34 4
5 5 ENQ	21 15 NAK	37 25 %	53 35 5
6 6 ACK	22 16 SYN	38 26 &	54 36 6
7 7 BEL	23 17 ETB	39 27 '	55 37 7
8 8 BS	24 18 CAN	40 28 (56 38 8
9 9 TAB	25 19 EM	41 29)	57 39 9
10 A LF	26 1A SUB	42 2A *	58 3A :
11 B VT	27 1B ESC	43 2B +	59 3B ;
12 C FF	28 1C FS	44 2C ,	60 3C <
13 D CR	29 1D GS	45 2D -	61 3D =
14 E SO	30 1E RS	46 2E .	62 3E >
15 F SI	31 1F US	47 2F /	63 3F ?

ASCII Hex Symbol	ASCII Hex Symbol	ASCII Hex Symbol	ASCII Hex Symbol
64 40 @	80 50 P	96 60 `	112 70 p
65 41 A	81 51 Q	97 61 a	113 71 q
66 42 B	82 52 R	98 62 b	114 72 r
67 43 C	83 53 S	99 63 c	115 73 s
68 44 D	84 54 T	100 64 d	116 74 t
69 45 E	85 55 U	101 65 e	117 75 u
70 46 F	86 56 V	102 66 f	118 76 v
71 47 G	87 57 W	103 67 g	119 77 w
72 48 H	88 58 X	104 68 h	120 78 x
73 49 I	89 59 Y	105 69 i	121 79 y
74 4A J	90 5A Z	106 6A j	122 7A z
75 4B K	91 5B [107 6B k	123 7B {
76 4C L	92 5C \	108 6C l	124 7C
77 4D M	93 5D]	109 6D m	125 7D }
78 4E N	94 5E ^	110 6E n	126 7E ~
79 4F O	95 5F _	111 6F o	127 7F □

SDK Package Version History

Release Date	SDK Package Version	Update
1.0.0	Jul. 2011	- Initial Release
1.1.0	May 2016	<ul style="list-style-type: none">- Add TSP650II model and mPOP model- Delete TSP650 / TSP828 model from the support model- Add Bluetooth support- Delete the serial/parallel interface from the corresponding interface- Add digital signature to StarIO.



Star Micronics is a global leader in the manufacturing of small printers. We apply over 50 years of knowhow and innovation to provide elite printing solutions that are rich in stellar reliability and industry-respected features. Offering a diverse line of Thermal, Hybrid, Mobile, Kiosk and Impact Dot Matrix printers, we are obsessed with exceeding the demands of our valued customers every day.

We have a long history of implementations into Retail, Point of Sale, Hospitality, Restaurants and Kitchens, Kiosks and Digital Signage, Gaming and Lottery, ATMs, Ticketing, Labeling, Salons and Spas, Banking and Credit Unions, Medical, Law Enforcement, Payment Processing, and more!

High Quality POS Receipts, Interactive Coupons with Triggers, Logo Printing for Branding, Advanced Drivers for Windows, Mac and Linux, Complete SDK Packages, Android, iOS, Blackberry Printing Support, OPOS, JavaPOS, POS for .NET, Eco-Friendly Paper and Power Savings with Reporting Utility, ENERGY STAR, MSR Reading, *future*PRNT, StarPRNT... How can Star help you fulfill the needs of your application?

Don't just settle on hardware that won't work as hard as you do. Demand everything from your printer. Demand a Star!

Star Micronics Worldwide

Star Micronics Co., Ltd.
536 Nanatsushinya
Shimizu-ku, Shizuoka 424-0066
Japan
+81-54-347-2163
<http://www.star-m.jp/eng/index.htm>

Star Micronics America, Inc.
65 Clyde Road. Suite G
Somerset, NJ 08873
USA
1-848-216-3300
<http://www.starmicronics.com>

Star Micronics EMEA
Star House
Peregrine Business Park, Gomm Road
High Wycombe, Buckinghamshire HP13 7DL
UK
+44-(0)-1494-471111
<http://www.star-emea.com>

Star Micronics Southeast Asia Co., Ltd.
Room 2902C. 29th Fl. United Center Bldg.
323 Silom Road, Silom Bangrak, Bangkok 10500
Thailand
+66-2-631-1161 x 2
<http://www.starmicronics.co.th/>