

# Intel<sup>®</sup> Atom<sup>™</sup> Processor E3800 Windows<sup>\*</sup> 8 IO Drivers

Programming Guide

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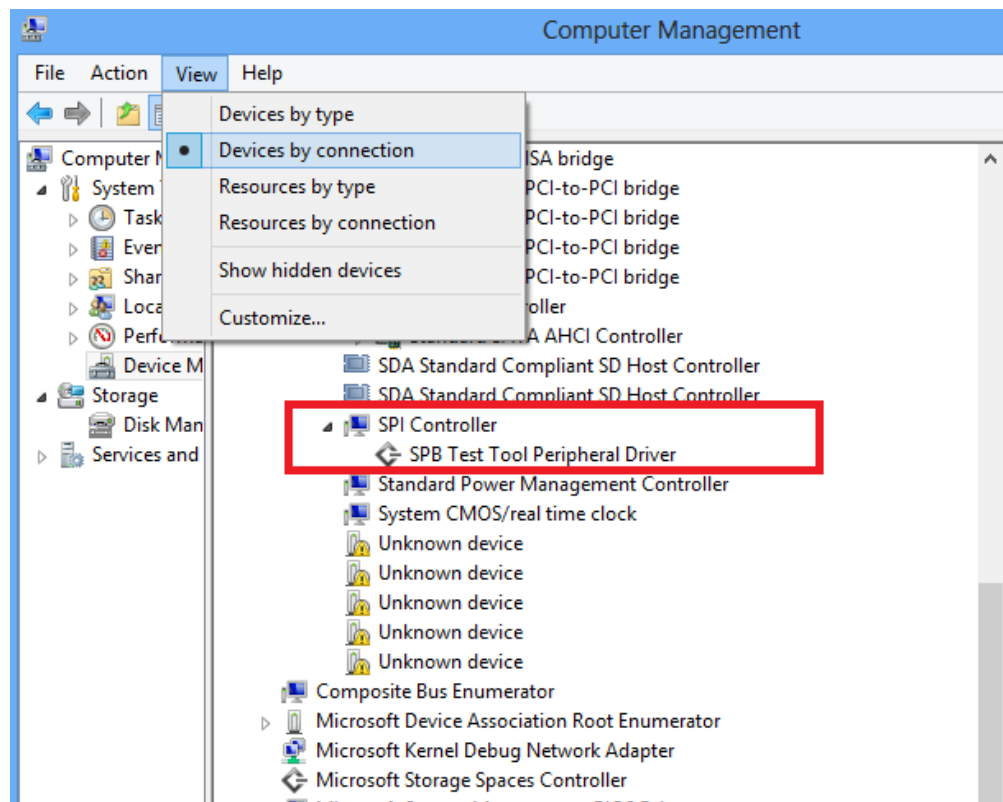
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# 1 Introduction

Microsoft Windows\* 8 provided new frameworks for GPIO, I<sup>2</sup>C, SPI and UART driver. So user-mode applications cannot directly open the controller devices using traditional methods because the GPIO/I<sup>2</sup>C/SPI/UART controllers do not expose any symbolic links or GUID. So the only way is to mount one sub-device under the controller which is able to open the parent target device and use this sub-device to receive requests from user-mode applications. Overall, all these controllers can be used with a similar method. Below is a structure example of the relationship between the controller (parent) and test device (sub-device).





## 2 GPIO Driver

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The GPIO driver in Windows 8 uses the Microsoft framework called GPIOCx. To use the GPIO controller, there must be a sub-device mounted under the specific GPIO controller. A user mode application can open this sub-device by using its symbolic name or GUID, and send IOCTLs or requests to it. Then only this sub-device can open the parent target (GPIO controller) and forward IOCTLs or requests to the GPIOCx framework, thus to GPIO controller driver.

Refer to the following for Microsoft framework:

<http://msdn.microsoft.com/en-us/library/windows/hardware/hh439508%28v=vs.85%29.aspx>

Here's a **sample code** from Microsoft showing how to write the sub-device driver mounted under GPIO controller, to open its parent and forward requests:

<http://code.msdn.microsoft.com/windowshardware/GPIO-Samples-d25ca63b>

And the description of supported IOCTLs:

<http://msdn.microsoft.com/en-us/library/windows/hardware/hh439470%28v=vs.85%29.aspx>



### 3 *I<sup>2</sup>C and SPI Driver*

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I<sup>2</sup>C and SPI drivers in Windows 8 used the Microsoft framework called the Simple Peripheral Bus (SPBCLx). To use I<sup>2</sup>C/SPI controller, there must be a sub-device mounted under the specific I<sup>2</sup>C/SPI controller. A user mode application can open this sub-device by using its symbolic name or GUID, and send IOCTLs or requests to it. Then only this sub-device can open parent target (I<sup>2</sup>C/SPI controller) and forward IOCTLs or requests to SPBCLx framework, thus to I<sup>2</sup>C/SPI controller driver.

Refer to the following for Microsoft framework:

<http://msdn.microsoft.com/en-us/library/windows/hardware/hh450906%28v=vs.85%29.aspx>

Here's a **sample code** from Microsoft showing how to write the sub-device driver mounted under the I<sup>2</sup>C/SPI controller to open its parent and forward requests:

<http://code.msdn.microsoft.com/windowshardware/SpbTestTool-adda6d71>

And the description of supported IOCTLs is here:

<http://msdn.microsoft.com/en-us/library/windows/hardware/hh450915%28v=vs.85%29.aspx>



## 4 *UART Driver*

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The UART driver in Win8 uses the framework of Microsoft called Serial Framework Extension (SerCx). To use UART controller, there must be a sub-device mounted under the specific UART controller. A user mode application can open this sub-device by using its symbolic name or GUID, and send IOCTLs or requests to it. Then only this sub-device can open parent target (UART controller) and forward IOCTLs or requests to SerCx framework, thus to UART controller driver.

Refer to the following for Microsoft framework:

<http://msdn.microsoft.com/en-us/library/windows/hardware/dn265348%28v=vs.85%29.aspx>

And the description of supported IOCTLs is here:

[http://msdn.microsoft.com/en-us/library/windows/hardware/ff547466\(v=vs.85\).aspx](http://msdn.microsoft.com/en-us/library/windows/hardware/ff547466(v=vs.85).aspx)

There are no sample codes of the sub-device provided by Microsoft, but it's quite similar to the SPB or GPIO interface.