

SPIFLAT

Windows CE DDI LC SPI Display Driver.

Documentation



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1. Abstract

The display driver for monochrome graphic displays with SPI control developed by F&S Elektronik Systeme GmbH is fully integrated into Windows CE 6.0.

Because of the implementation as a DDI display into the operating system Windows CE 6.0 the programmer can use the OS functions for drawing (LineTo, FillRect). Applications can be developed in C / C++ or managed code with the CompactFramework (2.0 or higher) to program applications graphically with buttons, checkboxes and other Windows Controls.

You can start now developing your application without stepping into the driving of the SPI display.

2. Installation

You can either use a PicoCOM1 kernel with SPIFLAT driver included or you can install the SPIFLAT.dll on your current kernel.

2.1. LCD Controller signals

The driver runs at 4-wire Serial Interface (S8) mode. The following table shows the signals for the LCD controller on the display:

PicoCOM1	LC Display
SPI-MOSI	SDA
SPI-CLK	SCK
SPI-CS	/CS0
IOxx	CD

2.2. Registry Settings

You can set up the SPIFLAT by registry. You can select the SPI interface through the chip select. You can also select a GPIO pin for the command/data signal.

```
[HKEY_LOCAL_MACHINE\Drivers\Display\SPIFLAT]
"FriendlyName" = "PC1 DDI SPI LCD Driver"
"Type"          = dword:0A
"Columns"      = dword:A0 ; set to 160 columns, needed to rotate
                                   ; from landscape to portrait mode (read
                                   ; chapter 3 for more information)
"Rows"         = dword:40
"PHYWidth"    = dword:3C
"PHYHeight"   = dword:28
"Bpp"         = dword:1
"Cursor"      = dword:0
"PHYFrameBuf" = dword:1
"Portrait"    = dword:1 ; 1=Portrait, 0=Landscape
"Rotation"    = dword:0
"CDPin"       = dword:27 ; Number of GPIO Pin (0-42 on J1, 0=IO0)
"SPICS"       = dword:0 ; SPI chip select (0-3, 0=SPI0:)
"Debug"       = dword:0 ; 1=info, 2=error, 3=all
```

The registry path for the SPIFLAT.dll is:

```
[HKEY_LOCAL_MACHINE\System\GDI\Drivers]
"Display"="ddi_SPIFLAT.dll"
```

2.3. Configure the SPI

Depending on the selected chip select for the SPIFLAT it is needed to configure the SPI. The ULTRA CHIP UC1601 (COG) LCD Controller Drivers runs with 7MHz clock frequency. So it is needed to set up the following registry values for SPI:

```
[HKEY_LOCAL_MACHINE\Drivers\BuiltIn\SPI1CS0] ;the SPI interface (0-3)
"ClockFreq"=dword:7270E0
"Mode"=dword:3 ; Clock active low, data valid on
                                   ; 2nd (=rising) edge
"ByteDelay"=dword:1
```

2.4. Disable explorer.exe

It is recommend to disable the explorer.exe program to use SPIFLAT. Therefore you can delete the registry values under:

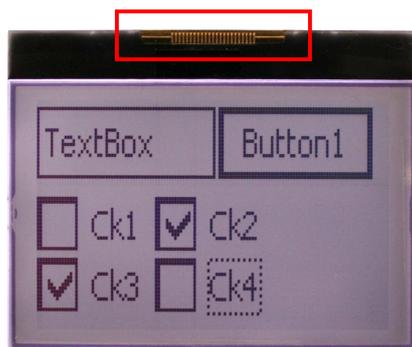
```
[HKLM\init]
"Launch50"="explorer.exe"
"Depend50"=hex:14,00, 1e,00
```

3. Application development

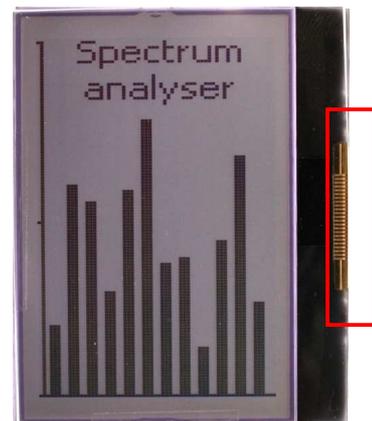
You can use either native code (C / C++) or managed code (C# / VB.NET) to develop applications for the PicoCOM1.

3.1. Landscape vs. Portrait mode

Before starting programming it is needed to determine the display format. You can choose between landscape or portrait mode. The next figure shows the side of the connection cable for the different modes:



0: Landscape mode



1: Portrait mode

Figure 1: Landscape vs. Portrait mode

3.2. Window / Form settings for landscape mode

To program for landscape mode it is needed to set up the window / form of the application to the dimensions of 132 x 64 (w x h in pixel).

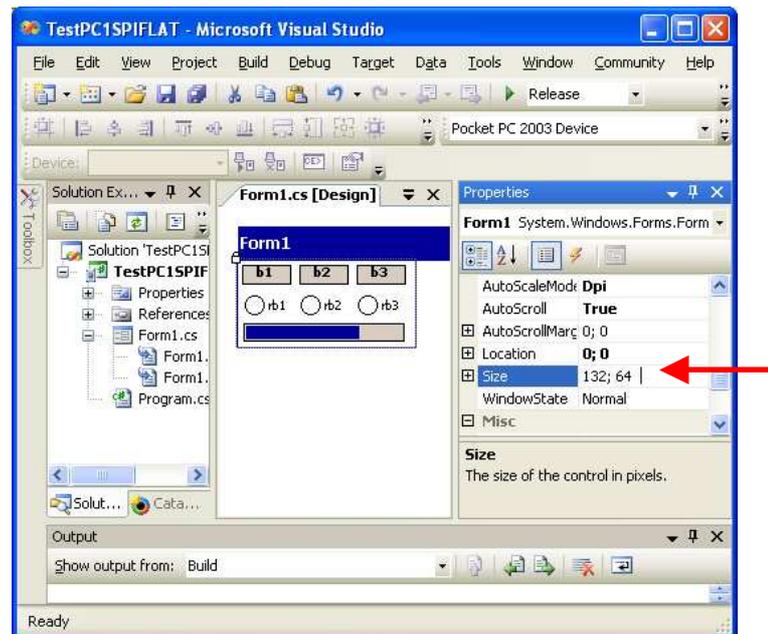


Figure 2: Window / Form setting for landscape mode

3.3. Window / Form settings for portrait mode

To program for portrait mode it is needed to set up the window / form of the application to the dimensions of 64 x 132 (w x h in pixel).

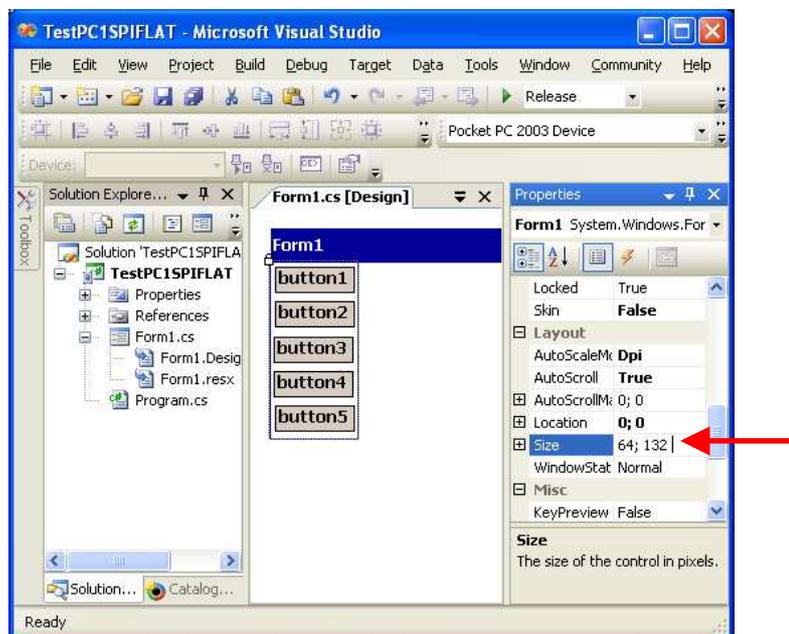


Figure3: Window / Form setting for portrait mode