Features:
Resolution: 240x320px (0.18mm of dot size)
Size: 2.8" (44.8x59.2mm)
Contrast: 500:1 (Brightness 240cd/m²)
Viewing angles (degs): Up=70°, Down=57°, Left=70° and Right=70°
Gross Weight: 43g
Controller: ILI9341
No external power supply is needed
Used Raspberry's GPIO: SPI (CE0, CE1, SCK, MISO, MOSI), BCM-GPIO: 17, 18 and 25.
Available GPIO (Broadcom): 2 (SDA), 3 (SCL), 4, 14 (TXD), 15 (RXD), 27 (Rv1=21), 22, 23, and 24. [Rv1=Revision 1 are Raspberrys sold before 2013]
Power pins also available: 5V, 3.3V and GND.

Package Included:
    * Diableco **ScreenPi**
    * Microfiber glass cleaner
    * 3xPIN connector (for 5V, GND and 3.3V)
    * 9xPIN connector (for extra GPIO)
    * Quick Install Guide

Description:
The Screen Pi is a LCD touch screen module for Raspberry Pi (A, B, A+, B+, 2, 3 and Zero). It consists in a 2.8" TFT display with 240x320 pixel and resistive touch panel. It uses SPI with FBTFT software through a provided DeviceTree Overlay.

The extra PINs are always provided with ScreenPi, but if you want them soldered you must ask for it.
Raspberry B+/2/3 users: ScreenPi overhangs the USB ports but they are still usable. PINs must be soldered on the top of the ScreenPi (if they are soldered in the bottom can't be used in B+/2/3 models).

Use with Raspbian (basic options)

This instructions are for Raspbian Jessie with kernel 4.4 (available since May 2016).
Download Raspbian from: http://www.raspberrypi.org/downloads/ (also the Raspbian at NOOBS is valid)
Install in a SD or micro SD, if you need help in the same web are the instruction:
                http://www.raspberrypi.org/documentation/installation/installing-images/README.md
Turn on your Raspberry Pi with HDMI, keyboard and ethernet cable (don't connect ScreenPi yet).
When the system starts go to **Preferences** => **Raspberry Pi Configuration**: we recommend to configure the "Localisation" tab to your language, Time Zone, WiFi country and of course Change Password.
Now open a Linux terminal (**Menu**=>**Accessories**) and write these commands:

```
cd ~ && wget -O screenpi.dtbo http://diableco.com/d/screenpi.dtbo
sudo mv screenpi.dtbo /boot/overlays/
echo "dtoverlay=screenpi,rotate=0,xmin=282,xmax=3686,ymin=126,ymax=3663" | sudo tee -a /boot/config.txt
sudo nano /boot/cmdline.txt
```

Now in the screen you see the file "cmdline", add at the end of the fist line (following "rootwait"):

```
fbcon=map:10 fbcon=font:VGA8x8 consoleblank=0
```

Control+X to exit, now on the bottom you will be asked to save the file, press the letter to say "yes".
Change the "**fb0**" to "**fb1**" in the file (remember, to exit is with the Control+X):

```
sudo nano /usr/share/X11/xorg.conf.d/99-fbturbo.conf
```

Turn off your Raspberry Pi, unplug the power connector and you can plug the ScreenPi module. Finally reconnect the power cable. Never plug or unplug the ScreenPi with the power cable plugged.

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When "basic options" are ready. (Remember: a reboot is needed to apply any of this changes).

Advanced configuration

The rotation of the screen can be done editing the file:

```
sudo nano /boot/config.txt
```

Search the "dtoverlay=screenpi" and add to this line more options, for example for horizontal orientation:

```
dtoverlay=screenpi,rotate=270,xmin=282,xmax=3686,ymin=126,ymax=3663
```

The options are:

- **rotate**: The screen angle to rotate. Valid numbers are 0, 90, 180 and 270 (default=270).
- **swapxy**: Needed when rotate is different to 0º. See the "rotation options" section.
- **fps**: Frame rate, the frecuency of consecutive images. Integer numbers, less than 35 (default=30).
- **debug**: The driver tells all warnings and errors. Only "1" or "0" are valid (default=0).
- **speed**: Is the SPI speed in Herzs, if it is connected try with 16MHz (default=32000000).
- **xohms**:
- **pmin** and **pmax**: Minimum and maximum values of pressure on the touch panel.
- **xmin** and **xmax**: Values of the corners, on the X axis. Recommended: xmin=282,xmax=3686
- **ymin** and **ymax**: Values of the corners, on the Y axis. Recommended: ymin=126,ymax=3663

Rotation options

By default the ScreenPi is show in portrait mode, but it can be rotated inº the **/boot/config.txt** file. When a rotation is done the X-Window-System must be informed by editing a second file:

```
sudo nano /usr/share/X11/xorg.conf.d/99-calib.conf
```

Paste this text and exit (Control+X, and say to "yes" to save the changes):

```
Section "InputClass"
    Identifier "Touchscreen"
    MatchProduct "ADS7846 Touchscreen"
    Option "SwapAxes" "DataONtable"
    Option "InvertX"  "DataONtable"
    Option "InvertY"  "DataONtable"
    Option "Calibration" "230 3850 3850 190"
    Option "EmulateThirdButton" "1"
    Option "EmulateThirdButtonTimeout" "1500"
    Option "EmulateThirdButtonMoveThreshold" "30"
EndSection
```

Now you need to change the three "**DataONtable**" by the numbers "**0**" or "**1**" depending on the angle:

	/boot/config.txt	/usr/share/X11/xorg.conf.d/99-calib.conf	
rotate= (Angle)	*SwapAxes*	*InvertX*	*InvertY*
0	0	0	1
90	1	1	1
180	0	1	0
270	1	0	0

The angle is on config.txt file, and the other 3 numbers are in 99-calib.conf file.

Uninstall or deactivate

To use the HDMI revert the "**fb1**" to "**fb0**" in the file /usr/share/X11/xorg.conf.d/99-fbturbo.conf
Delete the file /usr/share/X11/xorg.conf.d/99-calib.conf
And comment (adding a #) at the beginning of the "dtoverlay=screenpi" on the /boot/config.txt file.

Remember, you are using the driver: https://github.com/notro/fbtft (visit it to see the source code).

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