# Win 10 IoT Driver and Single Board Computer Display Support

As smart homes, iHomes and IoT become terms embedded in the human mind it is for engineers to develop technologies to explain and realize what this means. Raspberry Pi has become a popular and well known Single Board Computer (SBC) solution in many applications. Utilising an ARM core processor the early adopters were limited to creating solutions via Linux. Now with the introduction of Win10 IoT, the opportunities for developers have expanded exponentially including IoT styled sensor and control applications.

Supporting this new OS and extended range of platforms is a key aim of FTDI with their driver set for USB bridges.
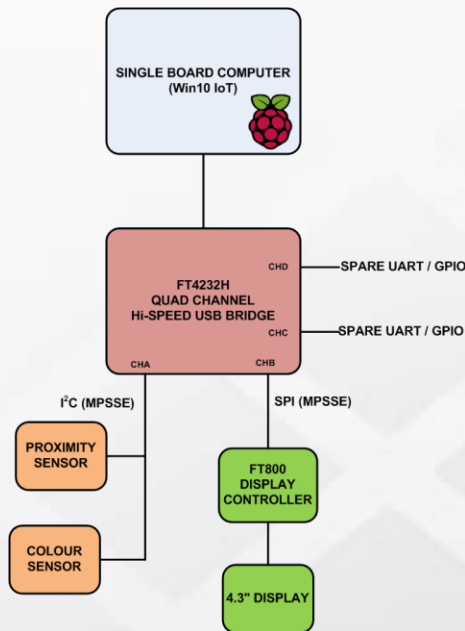
The DEMO components

- The Raspberry Pi2 has Windows 10 IoT installed
- FTDI Win10 IoT drivers providing direct access to the FT42332H USB bridge IC allowing access to multiple devices over SPI, I^2C or UART from one USB port on the RPi2.
- EVE enabled display offering full colour TFT graphics (or video) with touch control and audio out options controlled over SPI with an object oriented display list programming methodology.
- Sensor 1 – I^2C proximity sensor
- Sensor 2 – I^2C colour sensor

The Application

The Raspberry Pi2 (RPi2) enables a small dedicated function device to be developed for use in fixed or portable applications. This demonstration shows reading and displaying simple sensor data on a local display.

Hold an object close to the proximity sensor and the display will adjust the size of the displayed circle. The closer the object the larger the circle diameter.

Note the colour of the displayed circle will change depending on the colour of the object held over the colour sensor.

Sensor reading is done with the RPI via the MPSSE enabled I^2C ports of the FT4232H Hi-Speed USB Bridge.

The display is controlled by the RPI creating EVE compatible display lists which are transferred over SPI via a second channel of the FT4232H. It is FTDI's new IoT supporting driver on Windows 10 IoT which is controlling the device.

Future Technology Devices International Ltd. (FTDI Chip)
www.ftdichip.com

MPSSE

Multi Purpose Synchronous Serial Engine. This interface enables users to define their own synchronous serial interface. Data may be clocked in or out on a predefined clock edge. Data lengths may be controlled in terms of bits or bytes. This flexibility allows users to control the interface to match the requirements of a I^2C or SPI slave as well as many other standard formats.

More information on MPSSE may be found in AN_108:
http://www.ftdichip.com/Support/Documents/AppNotes/AN_108_Command_Processor_for_MPSSE_and_MCU_Host_Bus_Emulation_Modes.pdf

EVE Display Lists

EVE display lists are what define the displayed data. The list contains 6 key ingredients.

START > WHAT to draw > WHERE to draw >Object SIZE > Object COLOUR > END

The demonstration shown here used circles, bitmaps and text primitives to realize the display

Further EVE display list examples may be found here:

http://www.ftdichip.com/Support/SoftwareExamples/FT800_Projects.htm

Drivers

More information on our drivers for Win10 and many other OS may be found on our website at:

http://www.ftdichip.com/FTDrivers.htm

FTDI USB Bridge Devices

FTDI offer a vast range of USB bridging solution, including full speed, hi-speed and SuperSpeed data rates to many different protocols including UART, SPI, FIFO, and I^2C. We also offer solutions for USB hosting as well as peripherals. Information on FTDI USB solutions may be found at:

http://www.ftdichip.com/Products/ICs.htm

Graphic Controllers

EVE is the family name for FTDI's series of 3-in-1 graphics controllers providing display, audio and touch control in a simple SPI peripheral device for any MCU from the low cost 8-bit market to the full 32-bit powered devices.

More information on EVE can be found at:

http://www.ftdichip.com/EVE.htm

Future Technology Devices International Ltd. (FTDI Chip)

www.ftdichip.com