

## Connecting SPI Based LCD Panels

The SPI based display controllers share the Micromite's SPI interface with the touch controller (if present) and the BASIC program running on the Micromite. Sharing the SPI channel is essentially transparent to the BASIC program – see the description of the SPI communications function (Appendix D in the “Micromite Manual”) for a description of how to do this.

The following table lists the connections required between the LCD display board and the Micromite:

ILI9341 Display	ST7735 Display	Description	28-pin Micromite	44-pin Micromite	64-pin MM+	100-pin MM+
T_IRQ		Touch Interrupt	Configurable			
T_DO		Touch Data Out (MISO)	Pin 14	Pin 41	Pin 47	Pin 11
T_DIN		Touch Data In (MOSI)	Pin 3	Pin 20	Pin 5	Pin 12
T_CS		Touch Chip Select	Configurable			
T_CLK		Touch SPI Clock	Pin 25	Pin 14	Pin 4	Pin 10
SDO (MISO)		Display Data Out (MISO)	Pin 14	Pin 41	Pin 47	Pin 11
LED	LED	Power supply for the backlight (see below)				
SCK	SCK	Display SPI Clock	Pin 25	Pin 14	Pin 4	Pin 10
SDI (MOSI)	SDA	Display Data In (MOSI)	Pin 3	Pin 20	Pin 5	Pin 12
D/C	A0	Display Data/Command Control	Configurable			
RESET	RESET	Display Reset (when pulled low)	Configurable			
CS	CS	Display Chip Select	Optional - Configurable			
GND	GND	Ground				
VCC	VCC	5V supply (the controller draws less than 10mA)				

Where a Micromite connection is listed as "configurable" the specific pin should be specified with the OPTION LCDPANEL or OPTION TOUCH commands (see below).

The backlight power (the LED connection) should be supplied from the main 5V supply via a current limiting resistor. Typical values for this resistor are:

ILI9341 based display: 18Ω for a current of about 63mA.

ST7735 based display: 39Ω for a current of about 30mA.

The value of this resistor can be varied to reduce the power consumption or to provide a brighter display.

**Important:** Care must be taken with display panels that share the SPI port between a number of devices (display controller, touch, etc). In this case all the Chip Select signals must be configured in MMBasic or disabled by a permanent connection to 3.3V. If this is not done any unconnected Chip Select pins will float causing the wrong controller to respond to commands on the SPI bus.

### Micromite Plus only.

On the Micromite Plus the second SPI channel (SPI2) is used to communicate with the display and touch controllers. It is also used by the SD Card interface if implemented. If any of these features are enabled on the Micromite Plus SPI2 will also be unavailable to BASIC programs (it can use the first SPI channel instead).

## Configuring an SPI Based LCD Panel

To use the display MMBasic must be configured using the OPTION LCDPANEL command which must be entered at the command prompt (not in a program).

The syntax is:

```
OPTION LCDPANEL controller, orientation, D/C pin, reset pin [,CS pin]
```

Where:

'controller' can be either ILI9341, ST7735 or ILI9163 on the **Micromite Plus** or just ILI9341 on the standard (28 and 44-pin) Micromite.