

# XMOS™



XC-3 LED Tile Control Kit

## XC-3 LED Tile Control Kit

The XC-3 LED Tile Control Kit is an ideal starting point for prototyping LED scan board designs using XMOS XCore processors. It provides a complete software programmable solution for controlling LED arrays and strings.

The XC-3 LED Tile Control Kit includes:



XC-3 Development Board



XTAG Connector



USB Cable



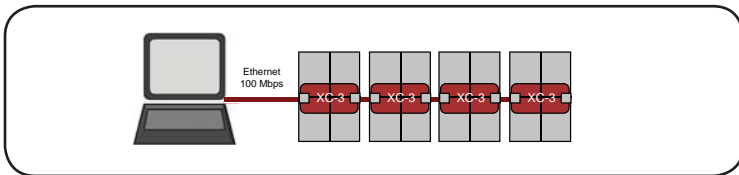
5V Power Supply

## Getting Started

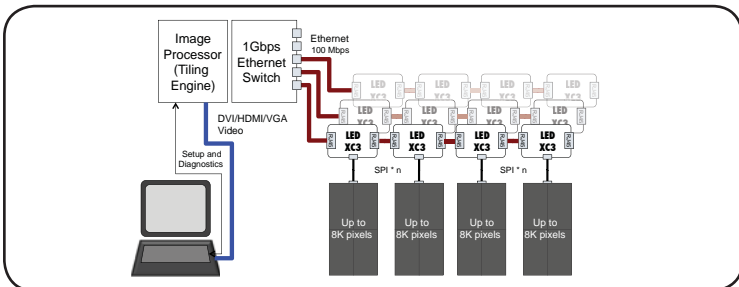
The XC-3 Card includes an implementation of the XMOS LED Reference Design software which provides native support for the MBI5026 and MBI5030 Macroblock LED Driver IC. The application is designed to interface to an SMD-32X16-1R1G1G-F-P6, a 32x16 pixel LED module using 12 x MBI5026 or MBI5030 on a 1/8 scan rate with a 16-way 2mm IDC connection. The reference design software is pre-loaded on the XC-3. The latest version is available free of charge from: [www.xmos.com](http://www.xmos.com)

### Driving LEDs with the XC-3 Card

The LED application can be used out-of-the-box as a demonstration. A PC can be directly connected to the Ethernet daisychain, and a standard video player, such as the open-source *mplayer* application, can be used to broadcast video.



For large video wall systems a separate distribution or tiling unit is required, which inputs DVI, HDMI or VGA video at HD resolutions, separates the data for each of the tiles in the system, packetises it and distributes over one or more gigabit Ethernet streams.



## Configuring a single board demonstration

The following instructions provide details on how to configure the software supplied with the XC-3 card when connected to a single SMD-32X16-1R1G1G-F-P6 LED module using MBI5030 drivers. Please refer to the *LED Reference Kit Application Note* for information on using MBI5026 drivers:

1. Plug-in the XC-3 using the 5V power supply.

The PLL LED on the bottom of the board lights up to indicate that the board has been powered up.

2. Connect the XC-3 card to the LED module.

The text “XMOS” is displayed.

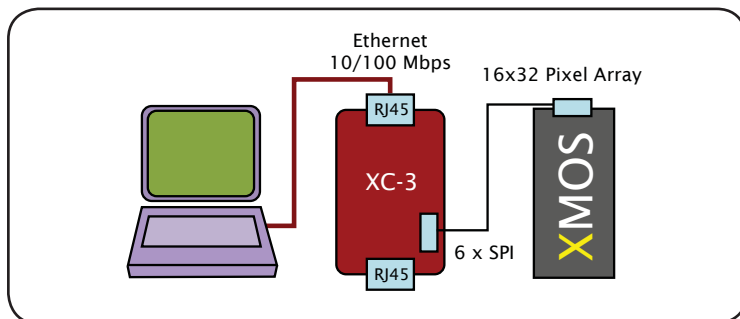
3. Set the PC to use a static Ethernet IP address, with an IP of **192.168.0.1**, and a subnet mask of **255.255.0.0**.

4. Connect the PC to the XC-3 using an Ethernet cable (not supplied in kit).

5. Test connectivity by pinging the default IP address of the XC-3: **192.168.0.254**.

6. Use the *mplayer* application, supplied with the LED Reference Design software, to stream video to the tiles, with the following command:

```
mplayer -vf scale=16:32 -loop 0 -vo xudp:noinit:  
tilewidth=16:tileheight=32 videofile.avi
```



## Configuring a dual board demonstration

1. Follow Step 1 and Step 2 from the single-board demonstration.
2. Run the LED Tile Configuration Application with the following command:

```
ledconfig.exe --prefix=192.168 --port=306
```

3. In the application, run the command:

```
ac
```

The application acknowledges this with “Autoconfigure packets sent” message.

4. Quit the application by typing:

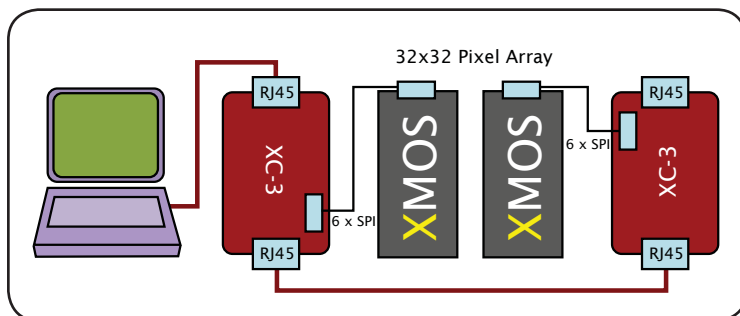
```
quit
```

The IP addresses for the LED modules are automatically configured.

5. Test connectivity with both tiles by pinging **192.168.1.1** and **192.168.1.2**.

6. Use the *mplayer* application, supplied with the LED Reference Design software, to stream video to the tiles, with the following command:

```
mplayer -vf scale=32:32 -loop 0 -vo xudp:  
tilewidth=16:tileheight=32:chainstart=0_0:  
chainpoint=1_0 videofile.avi
```



## Debugging the XC-3 Card

The XC-3 Kit includes an XTAG connector and USB cable that can be used for loading and debugging programs on the hardware via JTAG. You can connect the XTAG device to an XC-3 at anytime.

### Connect the XC-3 using a JTAG interface



Connect the XC-3 Card to the XTAG using the IDC connector.



Connect the XTAG to your development system using the USB cable.

Log into a shell with root permissions, open the file `/etc/fstab` and add the line:

```
none /proc/bus/usb usbfs defaults,devmode=0666 0 0
```

Unmount the USB file system, for example:

```
umount /proc/bus/usb
```

Remount the USB file system, for example:

```
mount /proc/bus/usb
```

Log out from root access

When you have installed the drivers, you need to install the development tools which include a port of the GNU debugger and utilities for loading programs onto the card.

## Install the software development tools

1. Download the software development tools from:  
**[www.xmos.com/downloads](http://www.xmos.com/downloads)**

2. Install to tools to the directory /home/user. Type:

```
tar -xzf DesktopTools version.tgz -C /home/user
```

The archive is unpacked into the subdirectory XMOS/  
DesktopTools/version/. This

3. Go to this directory and type:

```
source SetEnv
```

4. Type the following command:

```
xrun --listdevices
```

All the XMOS devices attached to your system are listed.

## Next Steps

Information on using the XC-3 and development tools is available from [www.xmos.com/xc3](http://www.xmos.com/xc3) including:

*LED Reference Design Application Note* - explains how to use the software installed on the XC-3

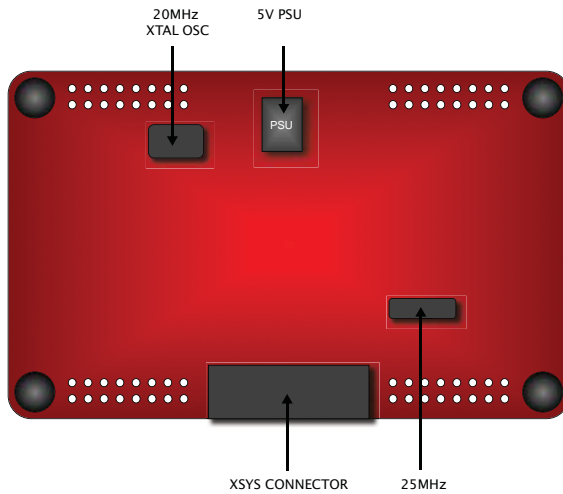
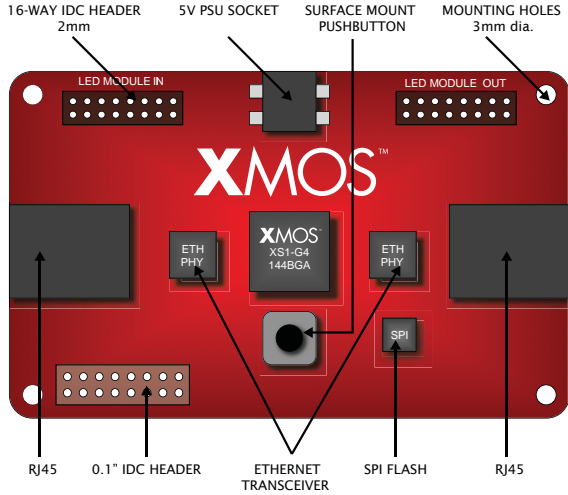
*XC-3 Hardware Manual* - hardware features on the XC-3 board

*Desktop Tools User Guide* - how to use the development tools

Further information on configuring the USB drivers and additional documentation is available from:

[www.xmos.com/support](http://www.xmos.com/support)

# XC-3 Card Features



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