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XC-3 LED Tile Control Kit Quick Start Guide

Version 1.1

XMOS®

1   Introduction

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.
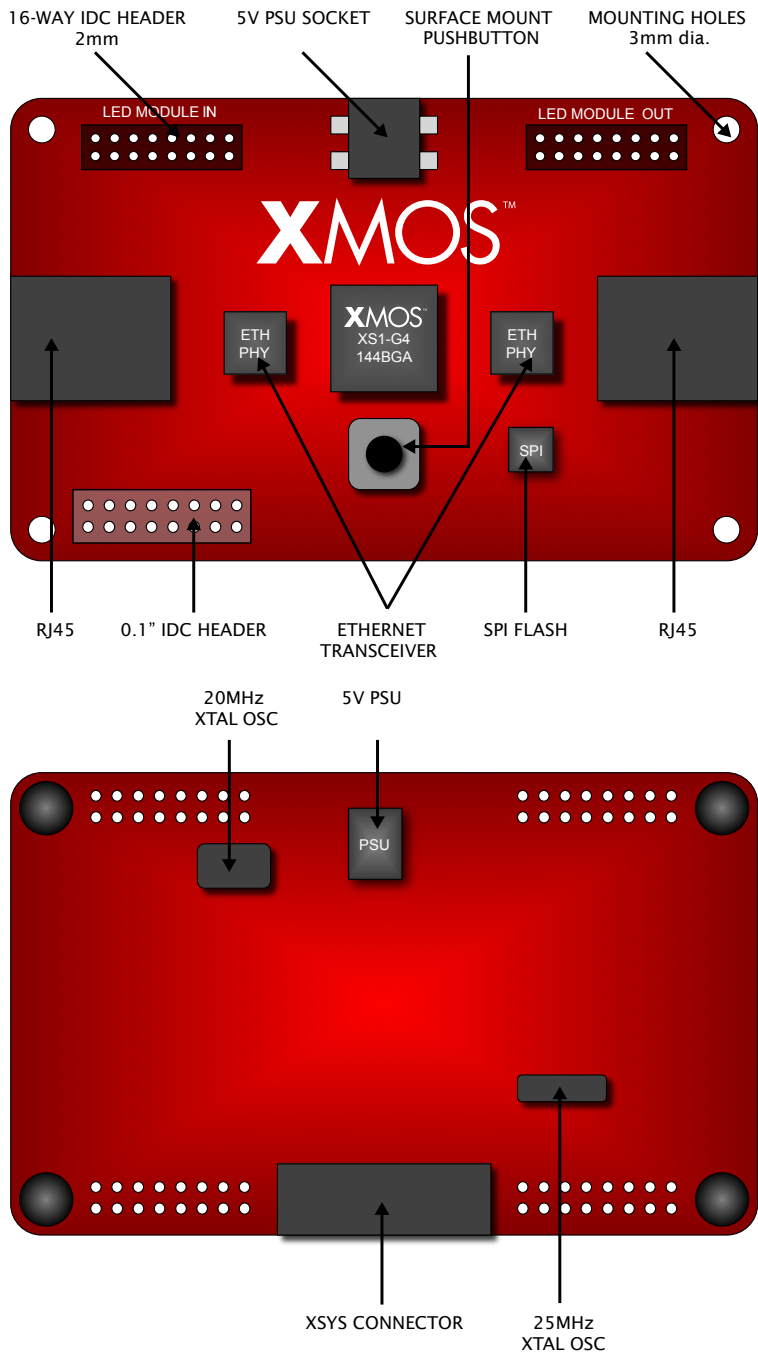
The XC-3 LED Tile Control Kit includes:

- XC-3 Development Board

- XTAG Connector that provides a JTAG interface between the board and XMOS Tools

- USB Cable to connect the XTAG to your development system

- External 5V power supply

Further information on the XC-3 is available from the XMOS web site. Download the hardware manual, schematics and design files from: **www.xmos.com/xc3**.

2   Getting Started

The XC-3 board 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 from: **www.xmos.com**

16-WAY IDC HEADER
2mm

5V PSU SOCKET

SURFACE MOUNT
PUSHBUTTON

MOUNTING HOLES
3mm dia.

LED MODULE IN

LED MODULE OUT

XMOS™

XMOS
XS1-G4
144BGA

ETH
PHY

ETH
PHY

SPI

RJ45

0.1" IDC HEADER

ETHERNET
TRANSCEIVER

SPI FLASH

RJ45

20MHz
XTAL OSC

5V PSU

PSU

XSYS CONNECTOR

25MHz
XTAL OSC

2.1   Driving LEDs with the XC-3 Board

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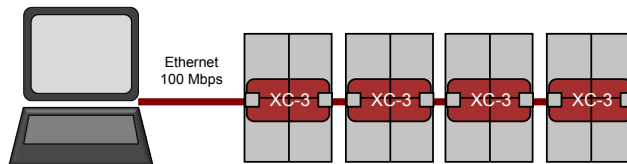
For large video wall systems a separate distribution or tiling unit is required, which inputs DVI, HDMI or VGA video at HD resolutions, separates the data for each of the tiles in the system, packetizes it and distributes over one or more gigabit Ethernet streams.
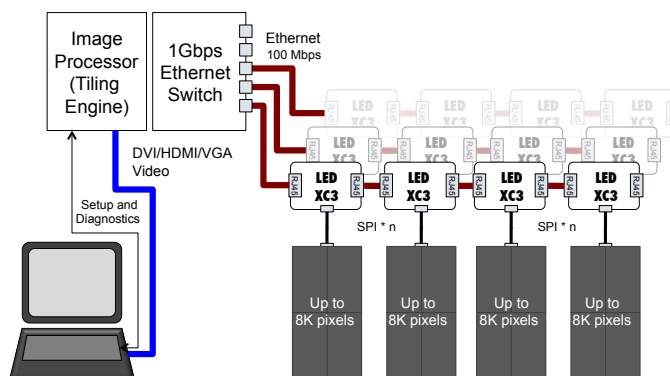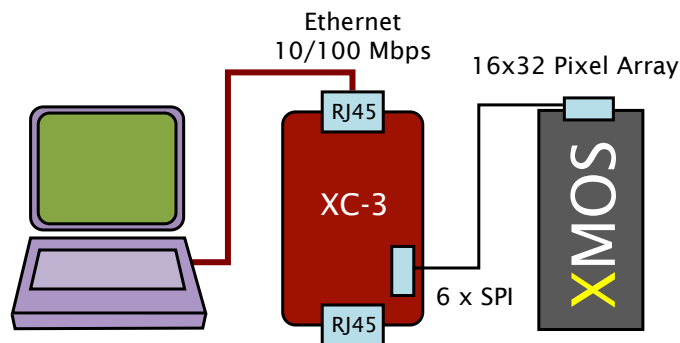
2.2   Configuring a single board demonstration

The following instructions provide details on how to confi gure the software supplied
with the XC-3 board 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 board 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
```

2.3   Configuring a dual board demonstration

1. Follow Step 1 and Step 2 from the single-board demonstration.

2. Run the LED Tile Confi guration 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
   ```
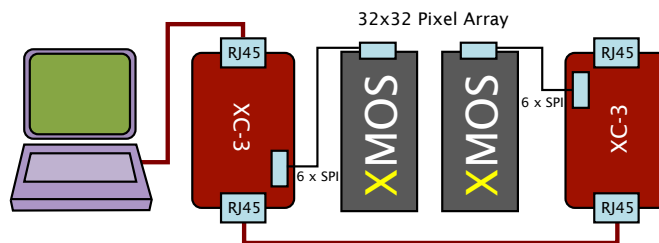
3   XMOS Tools Support

The XMOS tools are provide in a single platform-specific downloadable file from

> **http://www.xmos.com/tools**

Instructions on installing and using the XMOS Tools can be found in the XMOS Tools User Guide **http://www.xmos.com/published/xtools_en**. The following table provides a summary tools support for the XC-3 development board.

Minimum tools version required	9.7
Board support file	XC-3.xn
USB-to-JTAG adaptor	XTAG
USB-to-JTAG driver	FTDI
Hardware Guide	http://www.xmos.com/published/xc3hw

4   Document History

Date	Release	Comment
2009-07-08	1.0	First release
2010-05-10	1.1	Added tools support section

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