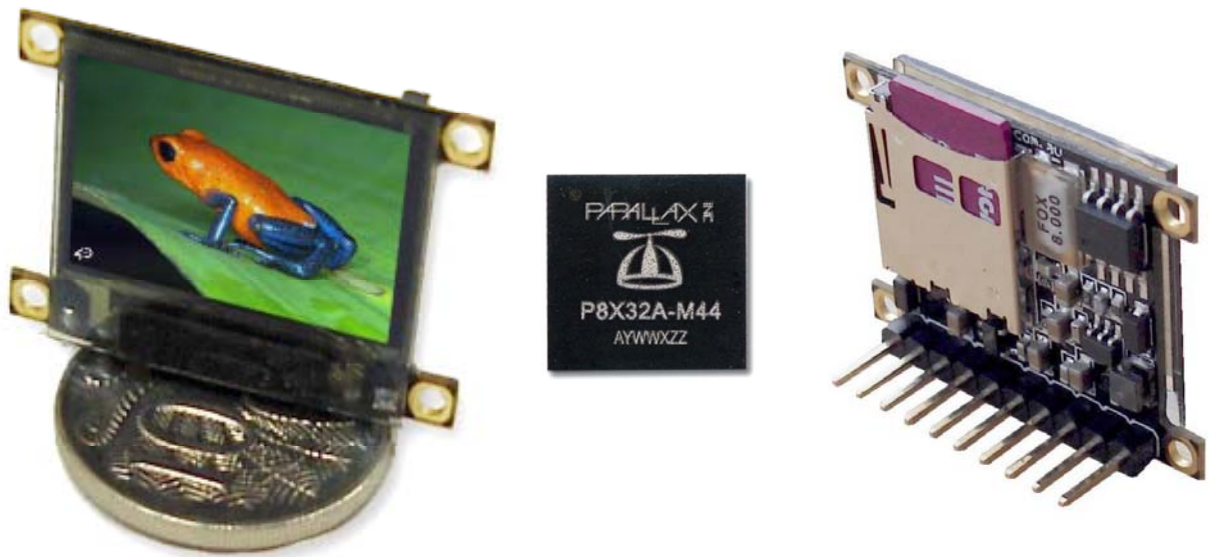# *Micro*OLED

µOLED-96-PROP
USERS MANUAL

Embedded Propeller OLED Display Module
tiny development module with integrated micro-SD card support

Revision 1.1

4D Systems

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1   Introduction

The **µOLED-96-PROP** is an extremely compact and a cost effective ready to go 'drop in' embedded display module that will deliver 'stand-alone' functionality to your project. The module represents a unique combination of a powerful micro controller, the Propeller chip from Parallax Inc, a 0.96″ 96x64 pixel 65K full colour OLED display and a micro-SD memory card socket capable of supporting up to 2GB of storage; all in an incredibly tiny 32.7mm x 23mm package. The module is designed to provide your projects with integrated functionality right out of the box.

The **µOLED-96-PROP** allows you to leverage the extensive library of Propeller Objects already written, to make the module into a complete project in record time. The **µOLED-96-PROP** is supplied with a prototype SPIN Object that handles the display initialization and provides sample Methods for low-level graphics functions. It is intended as a shell, into which, you can further program and develop the functionality that you need for your project design.
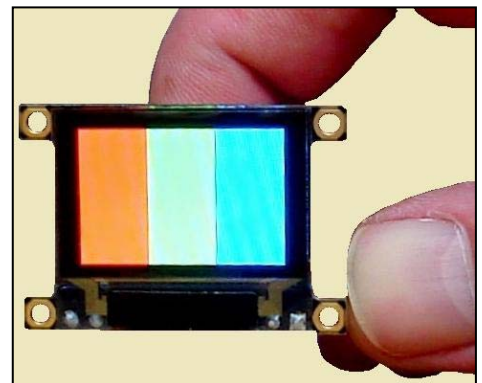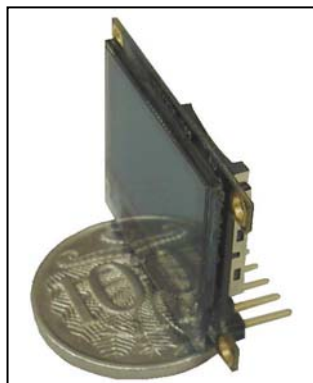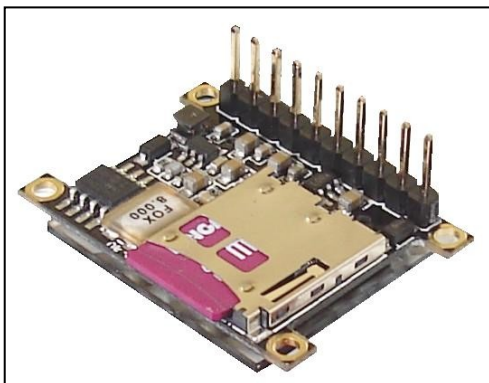
2   Features

The **μOLED-96-PROP** module is aimed at being integrated into a variety of different applications facilitating the designer to quickly and cost effectively complete a product and thus reduce 'time to market'. The module can also be used as a tiny development environment to explore the features of the Propeller chip and the OLED display technology.

- Propeller chip based design.
- 96 x 64 pixel resolution, 256 or 65K true to life colour OLED screen.
- 0.96″ size diagonal OLED display. Module Size: 32.7 x 23 x 5.2mm.
- No backlighting with near 180° viewing angle.
- Low power design. Voltage supply from 3.6V to 6.0V external DC source. **Note**: If using the module with a micro-SD card, due to the characteristics of some memory cards the module may require input voltages greater than 4.0 Volts.
- Simple 5 pin interface provides the programming interface and power to the Propeller chip, the OLED display and the μSD memory card.
- Four General Purpose Propeller I/O pins (plus dedicated Rx and Tx) available for interfacing additional devices.
- A single straight 10 pin male header provides access to power, programming interface and I/O pins.
- Application boards can be piggy-backed via the 10 pin header for an overall very small and low profile design.
- Onboard micro-SD (**μSD**) memory card adaptor can be used for storing Propeller programs, icons, images, animations, movie clips as well as data logging. 64Mb to 2Gig μSD memory cards can be purchased separately.
- Optional USB to Serial interface via the 4D micro-USB, **μUSB-MB5** or **μUSB-CE5** modules.
- Compatible with the Propeller Tool IDE for programming and user application development.
- Direct control of display functions using SPIN or Propeller Assembler code.
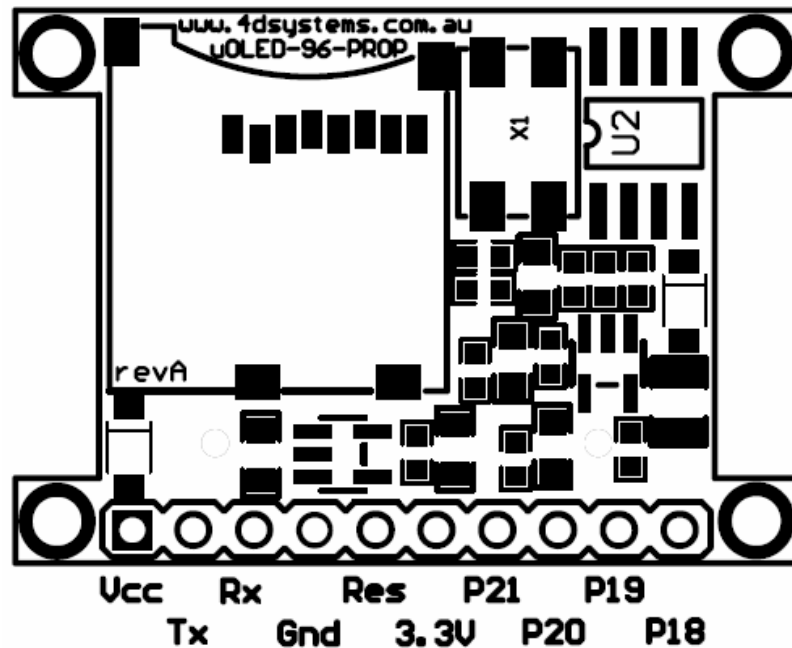
μOLED-96-PROP

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µOLED-96-PROP
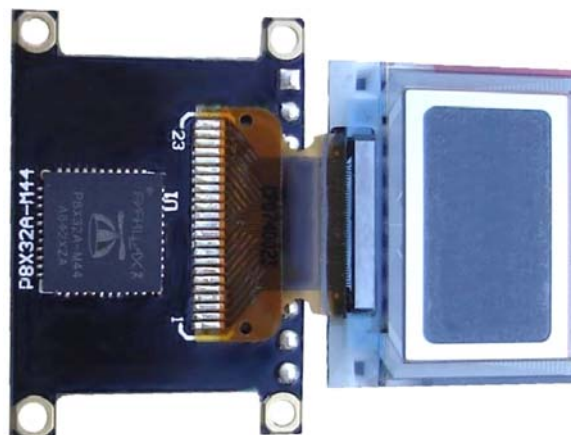
3   User Interface Pin Description

| PIN	FUNCTION	DESCRIPTION	
1	VCC	3.6 Volts to 6.0 Volts Supply Input.	These 5 pins match the same pins on the micro-USB modules, **µUSB-MB5** or **µUSB-CE5** for easy USB-Serial connectivity.
2	Tx	Serial Transmit Pin (Data Out).	
3	Rx	Serial Receive Pin (Data In).	
4	GND	Ground.	
5	Res	Module and Propeller RESET signal. Active Low.	
6	3.3V	Regulated 3.3 Volts output.	
7	P21	General Purpose Propeller I/O signal, P21.	
8	P20	General Purpose Propeller I/O signal, P20.	
9	P19	General Purpose Propeller I/O signal, P19.	
10	P18	General Purpose Propeller I/O signal, P18.	

BACK VIEW

4   Circuit Diagram

The circuit diagram of the **µOLED-96-PROP** is shown below. Please note the dedicated signals of the Propeller chip used for controlling and interfacing to the OLED display.
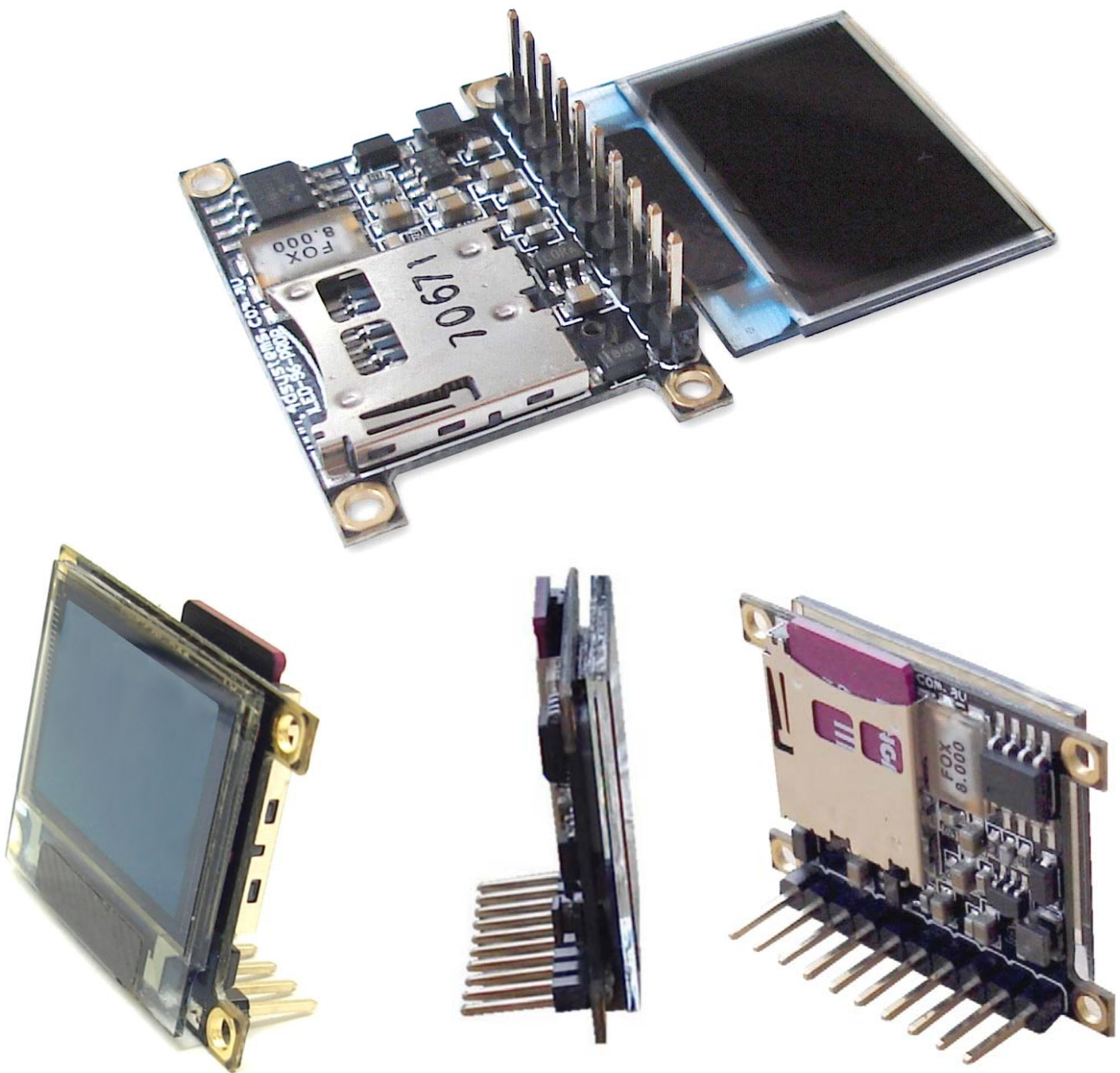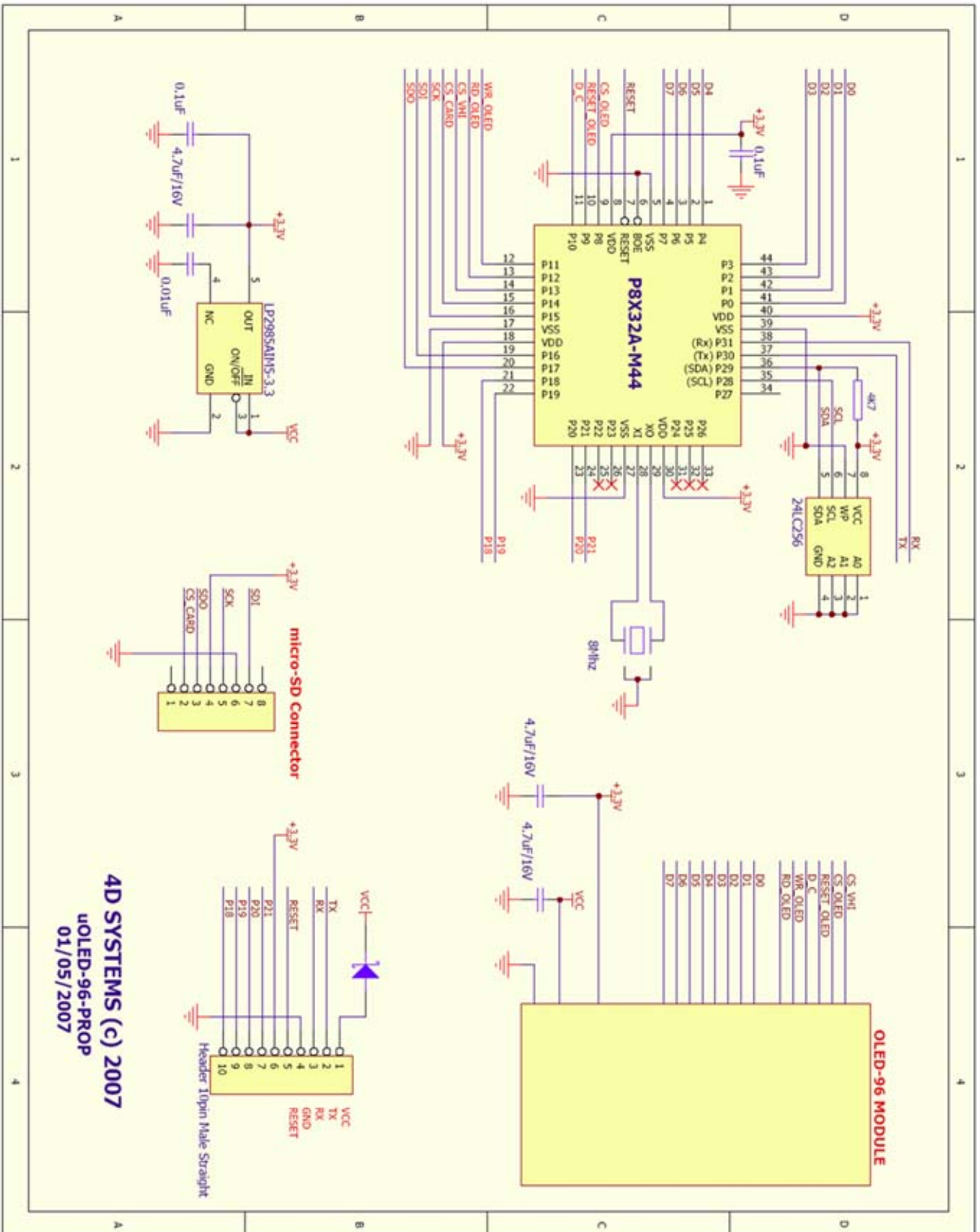
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uOLED-96-PROP
01/05/2007

5 Display Graphics Drivers - Object Code

The **µOLED-96-PROP** is supplied with "**uOLED-96-Prop.spin**" which is a prototype SPIN Object, a Propeller microcontroller code, that handles the display initialization and provides sample Methods for low-level graphics functions. It is intended as a shell, into which, you can further program and develop the functionality that you need for your project design.

Each method is also documented and explained in clear detail to help with further code development. Please visit www.4dsystems.com.au/prod.php?id=14 for the latest Object code drivers.

6   USB-Serial Interface

The **μOLED-96-PROP** module needs to be interfaced to a PC from time to time for uploading the Propeller chip with user application code. Using a standard USB cable and any one of the 4D Systems micro-USB modules (**μUSB-MB5** or **μUSB-CE5**) as shown below, a PC to **μOLED-96-PROP** connection can be achieved simply. The micro-USB module (optional extra), simply connects to the **μOLED-96-PROP** module and captures the USB data and converts it into serial TTL data. The micro-USB modules and drivers are available from your local 4D distributor. This is an optional extra product and is not included with the module.
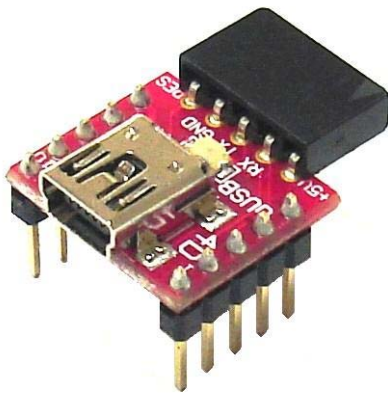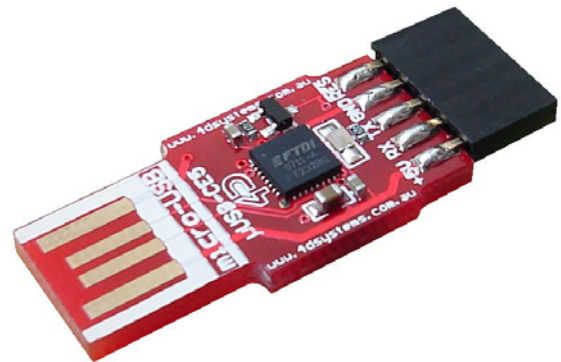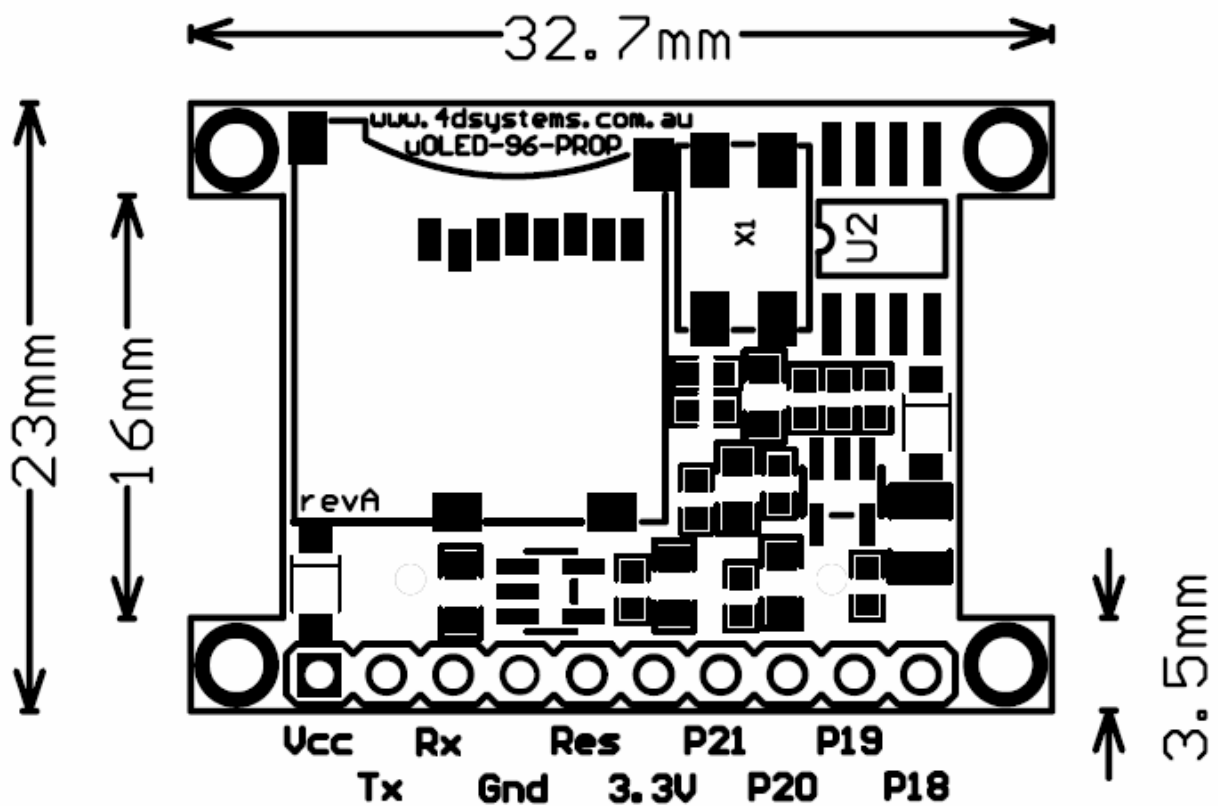
μUSB-MB5   **μUSB-CE5**
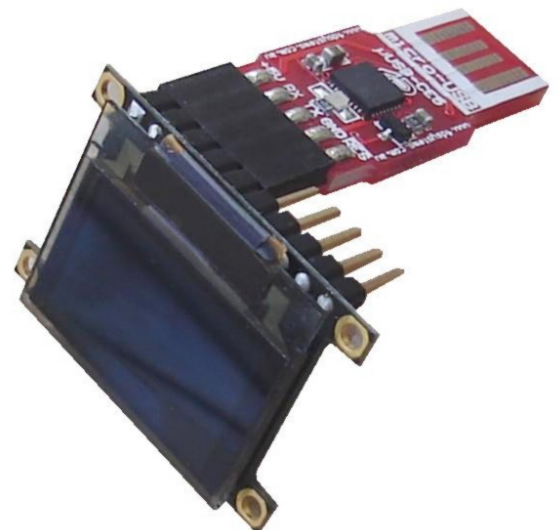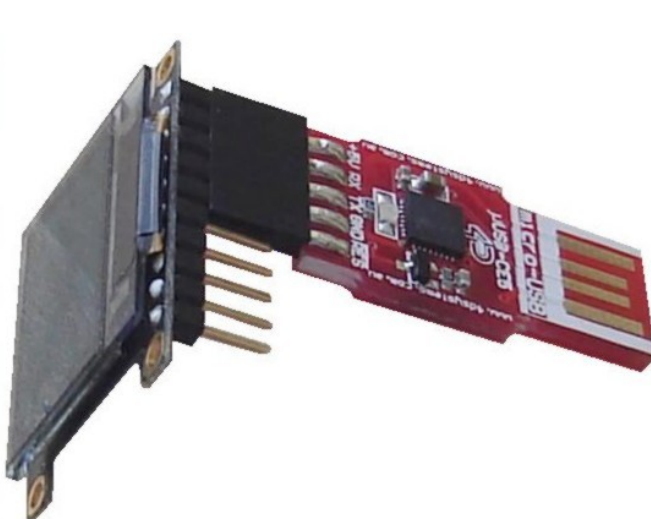
7   Mechanical Details

BACK VIEW

The **μOLED-96-PROP** module dimensions are **32.7**mm x **23**mm x **5.2**mm.

8   Related Products

- **μUSB-MB5**
  - micro-USB module, USB to Serial Bridge, CP2102 Chipset
  - Standard USB miniB connector
  - 10 pin header provides the following signals:
    - 5V, 3.3V, GND, Tx, Rx, Suspend,
    - DTR, CTS, RTS, GND
  - 5 Volts supply @ 500mA, 3.3 Volts supply @ 100mA
  - Additional flow control signals, DTR, CTS, RTS
  - Available with an additional 5 pin header for the μOLED interface
    www.4dsystems.com.au/prod.php?id=18

- **μUSB-CE5**
  - micro-USB module, USB to Serial Bridge, FTDI Chipset
  - Plugs directly into USB port
  - 5 pin header provides the following signals:
    - 5V, Rx, Tx, GND, Reset
  - 5 Volts supply @ 500mA
    www.4dsystems.com.au/prod.php?id=19

- **Software Utility Tools (free download)**
  - The Propeller Tool Software, a PC based IDE environment for developing SPIN and Propeller Assembler code can be downloaded from the Parallax website:
    www.parallax.com
  - The Propeller Object Exchange contains many source code objects for the Propeller microcontroller. They are created and submitted by Propeller customers as well as Parallax engineers for use by everyone in the community.
    http://obex.parallax.com/

9 Appendix

9.1 Precautions with OLEDs:

- Avoid having a White Background. The more pixels that are lit up, the more the OLED module will consume current. A full white screen will have the highest power consumption.

- Avoid displaying objects or text on White Backgrounds. This will cause a smearing effect which is inherent to all OLED displays. Instead, try a shaded mixed colour as the background or better still a black background. Ideally have mixed coloured objects/text/icons on a black background.

- Avoid having to display the same image/object on the screen for lengthy periods of time. This will cause a burn-in which is a common problem with all types of display technologies. Blank the screen after a while or dim it very low by adjusting the contrast. Better still; implement a screen saver feature.

9.2 Help and Other Information:

- Assistance with latest information and downloads visit the 4D Systems products web-page of your local distributor or visit the 4D Systems website.

- Questions and technical support please visit the discussion forum at 4D website www.4dsystems.com.au

- All related product information can be downloaded from http://www.4dsystems.com.au/prod.php?id=14