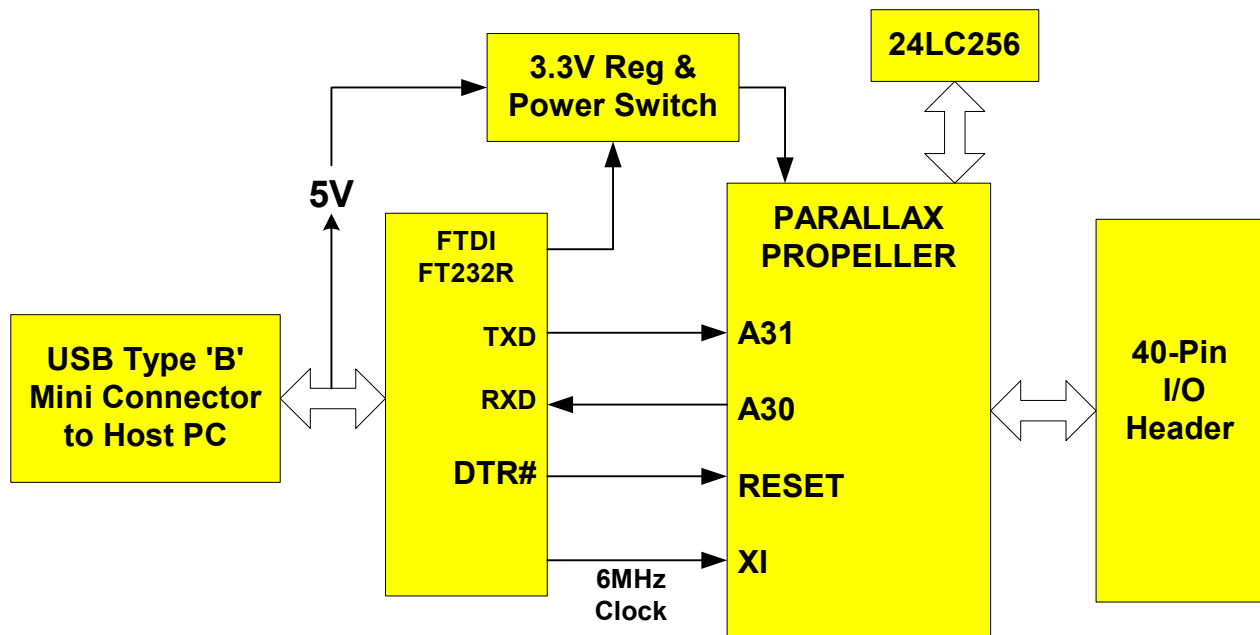


# DLP-PROP

**\*LEAD-FREE\***

## FEATURES:

- Simultaneous Multi-Processing via Eight 32-Bit Processors in One Chip
- Programmable in Both Spin™ and Assembly Language
- Permanent Unique Serial Number Accessible Via USB
- Firmware Upload via USB Port
- Fully Assembled & Ready for Use
- Onboard 3.3V Regulator and EEPROM for Program Storage
- Onboard LED Available to the Propeller or User Electronics
- USB Port Powered from Host PC (USB 1.1/2.0 Compatible)
- USB Drivers Provided for Windows XP, XPx64, Server2003, 2000
- Lead-Free, RoHS Compliant



## 1.0 INTRODUCTION

The DLP-PROP is a preassembled, USB-powered module for demonstrating the new Propeller chip from Parallax in a standard 0.9-inch wide, 40-pin footprint. User electronics can be connected via the 28 unused I/O pins. The Propeller is clocked via a 6MHz external clock. Using the on-chip PLL in the Propeller, the following clock frequencies can be generated internally: 6, 12, 24, 48, and 96MHz.

The DLP-PROP was developed to be fully compatible with Parallax's new Spin programming language and development environment. For detailed operating instructions, refer to the Propeller Manual, available from the Parallax website.

## 2.0 PERMANENT SERIAL NUMBER

Each DLP-PROP module contains a unique, 32-bit, hard-coded serial number known as the "ChipID" that cannot be altered by any means. This serial number can be read via the USB interface using the D2XX drivers and used to identify the module via the host software.

If the DLP-PROP is configured for VCP driver use, it must first be reconfigured to use the D2XX drivers by running MPROG before the serial number can be read.

## 3.0 APPLICATION DEVELOPMENT

Propeller software for compiling the Spin source code is available for download via the Propeller Downloads page (<http://www.parallax.com/propeller/downloads.asp>). Any program written for the Propeller will run on the DLP-PROP.

The latest version of the Propeller Manual is also available from this web location.

## 4.0 QUICK START GUIDE

***This guide requires the use of a Windows XP, XPx64, Server2003, or 2000 PC that is equipped with a USB port.***

1. Download the combined Windows VCP / D2XX driver set from either [www.dlpdesign.com](http://www.dlpdesign.com) or [www.ftdichip.com](http://www.ftdichip.com). Unzip the drivers onto a blank floppy disk or into a folder on the hard drive.
2. The DLP-PROP can be configured to receive its operating power from the USB port or from user electronics. Pins 18 and 19 allow for this configuration. (Refer to the following Pinout Description section for a detailed explanation of the DLP-PROP's electrical interface.)

**Note:** The module will not operate until a power source has been selected as mentioned in Step 2.

3. Connect the DLP-PROP to the PC via a standard A-Mini-B, 6-foot USB cable. This action initiates the loading of the USB drivers. When prompted, select the folder in which the device drivers were stored in Step 1. Windows will then complete the installation of the device drivers for the DLP-PROP module. The next time the DLP-PROP is attached, the host PC will immediately load the correct drivers without any prompting.

Reboot the PC if prompted to do so. At this point, the DLP-PROP is ready for use.

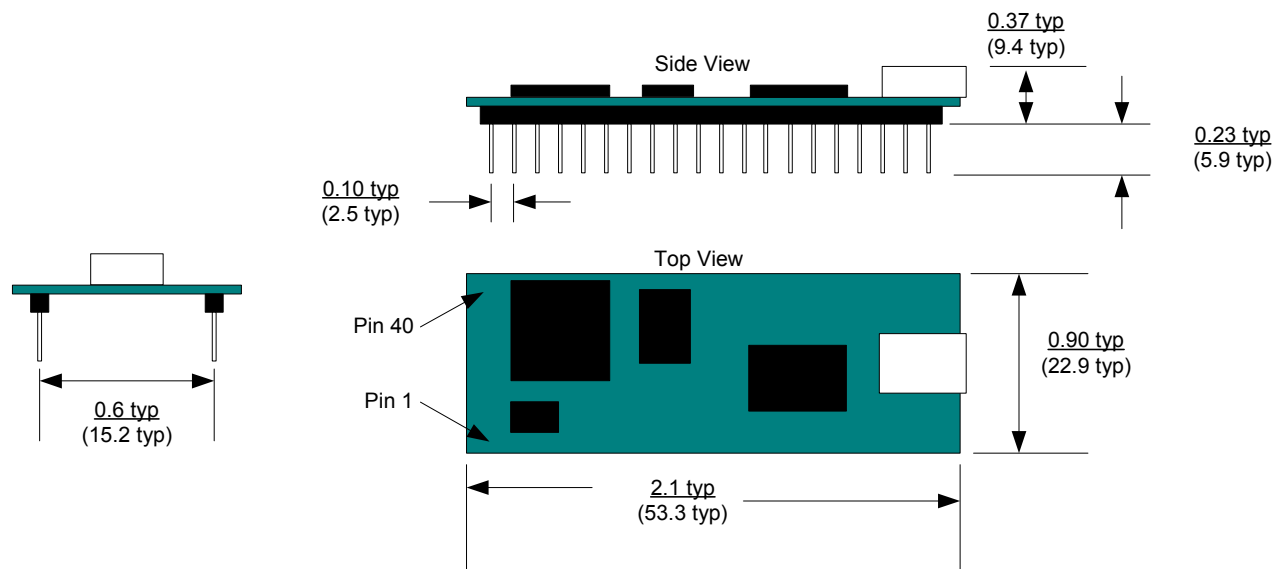
Note: If you wish to change the driver type from VCP to DLL (or vice versa), you must run the MPROG utility and change the setup information stored in the EEPROM. (This utility can be downloaded from either [www.dlpdesign.com](http://www.dlpdesign.com) or [www.ftdichip.com](http://www.ftdichip.com).) The DLP-PROP is shipped with default VID, PID, etc. values programmed into the EEPROM with the driver mode set to VCP. You only need to run the MPROG utility if you want to change these default values.

## 5.0 PINOUT DESCRIPTION

Pin #	Description
1	<b>GROUND</b>
2	<b>A8</b> (I/O) Port pin connected to the Propeller
3	<b>A9</b> (I/O) Port pin connected to the Propeller
4	<b>A10</b> (I/O) Port pin connected to the Propeller
5	<b>A11</b> (I/O) Port pin connected to the Propeller
6	<b>A12</b> (I/O) Port pin connected to the Propeller
7	<b>A13</b> (I/O) Port pin connected to the Propeller
8	<b>A14</b> (I/O) Port pin connected to the Propeller
9	<b>A15</b> (I/O) Port pin connected to the Propeller
10	<b>A16</b> (I/O) Port pin connected to the Propeller
11	<b>A17</b> (I/O) Port pin connected to the Propeller
12	<b>A18</b> (I/O) Port pin connected to the Propeller
13	<b>RESET</b> (In) Pulling this pin to Ground will reset the Propeller
14	<b>GROUND</b>
15	<b>GROUND</b>
16	<b>GROUND</b>
17	<b>SW33V</b> (Out) 3.3-volt switched power from EXTVCC, controlled via CBUS4 of the FT232R and the Q1 MOSFET power switch. R1 and C8 control the power-up rate to help limit inrush current. SW33V becomes active after the host PC enumerates the module.

18	<b>PORTVCC</b> (Out) 5-volt power from the host PC. Power from the host immediately exits the module via this pin. If power from the host PC is to be used, this pin must be connected to EXTVCC.
19	<b>EXTVCC</b> (In) Main module power input. 5-volt power must be applied to this pin for the module to operate. Connect to PORTVCC if the module is to be powered by the USB port (typical configuration). 500mA is the maximum current available to the DLP-PROP and target electronics if the USB device is configured for high power.
20	<b>GROUND</b>
21	<b>GROUND</b>
22	<b>A20</b> (I/O) Port pin connected to the Propeller
23	<b>A21</b> (I/O) Port pin connected to the Propeller
24	<b>A22</b> (I/O) Port pin connected to the Propeller
25	<b>A23</b> (I/O) Port pin connected to the Propeller
26	<b>A24</b> (I/O) Port pin connected to the Propeller
27	<b>A25</b> (I/O) Port pin connected to the Propeller
28	<b>A26</b> (IO) Port pin connected to the Propeller
29	<b>A0</b> (IO) Port pin connected to the Propeller
30	<b>GROUND</b>
31	<b>A1</b> (IO) Port pin connected to the Propeller
32	<b>A2</b> (IO) Port pin connected to the Propeller
33	<b>A3</b> (IO) Port pin connected to the Propeller
34	<b>LED</b> (I/O) Port pin connected to the Propeller and on-board LED. The LED can be driven by the Propeller or by external user electronics if A27 is configured as an input.
35	<b>A19</b> (IO) Port pin connected to the Propeller
36	<b>A4</b> (IO) Port pin connected to the Propeller
37	<b>A5</b> (IO) Port pin connected to the Propeller
38	<b>A6</b> (IO) Port pin connected to the Propeller
39	<b>A7</b> (IO) Port pin connected to the Propeller
40	<b>GROUND</b>

## 6.0 MECHANICAL DIMENSIONS INCHES (MM)



## 7.0 DISCLAIMER

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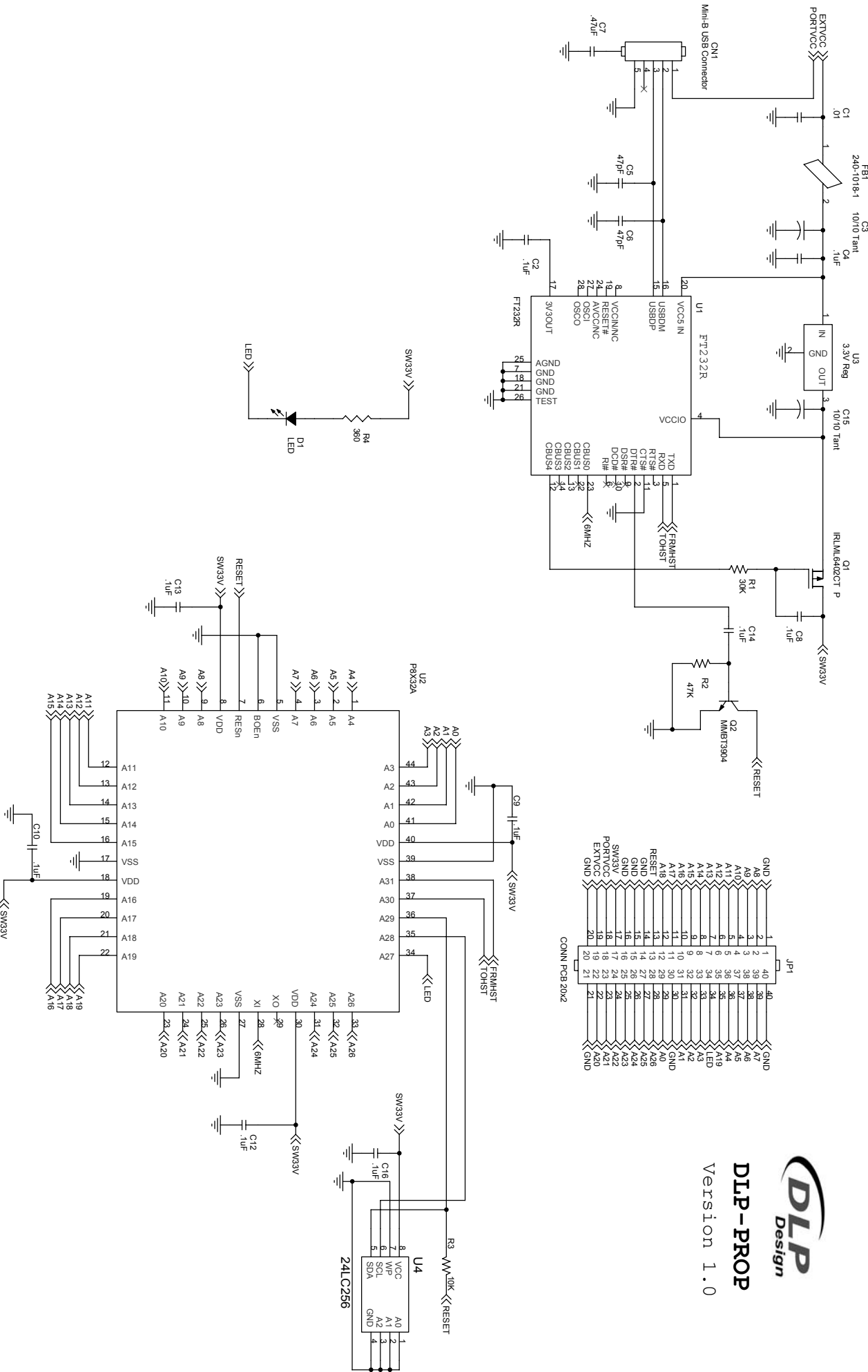
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This document provides preliminary information that may be subject to change without notice.

## 8.0 CONTACT INFORMATION

DLP Design, Inc.  
1605 Roma Lane  
Allen, TX 75013

Phone: 469-964-8027  
Fax: 415-901-4859  
Email: [support@dlpdesign.com](mailto:support@dlpdesign.com)  
Internet: <http://www.dlpdesign.com>



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