PropLoader Project Report

Project Number: PP008

Project Description:
        Battery-powered propeller-powered device to load program to a remote propeller-based circuit without a computer. At work I have 13 fixtures that each contain 10 identical propeller-based circuit boards. Each of these boards has several temperature sensors. The problem came about when I needed to change the code in these temperature sensor boards. It quickly became inconvenient to remove each board from the fixture and take it back to my computer for re-programming. I decided that I could create a stand-alone device that could update the code in these boards without removing them from the fixture.

        With this solution, I only need to compile the code for the board at my computer and copy it to an SD card. I then install the SD card into the PropLoader and carry the PropLoader to the fixture to be re-coded, plug in the target cable to the prop-loader port on the target board and apply power to the PropLoader.

        In my research for a solution to this problem, I found a couple of objects in the Propeller OBEX, SimpleSDBootLoader and PropellerLoader. SimpleSDBootLoader is programmed into the SchmartBoard Propeller module. When power is applied, this code looks for an SD card inserted into the SD Module. It continues to re-boot until a card is detected. When an SD card is detected, it loads a file called autoexec.bin into RAM and executes this new code.

        LEDs provide status at each step of the process. Status is also provided on the optional LCD module. The addition of the LCD module makes a much larger package, but allows for status to be provided in readable format. For a compact device the LCD is not required.

        To create autoexec.bin, first of all the target code needs to be compiled and saved as "target.binary". This file is included as part of the PropLoader code. PropLoader is then re-compiled and this binary file is saved to the SD card as autoexec.bin.

        PropLoader can be used to update the code in ANY Propeller-based circuit that has a 4-pin PropPlug port for programing.

Status decoding:

LCD Message	LEDs	Comment
Starting	1	
Checking SD card	2, if no card	If no card, 1 and 2 flash
Opening File	1, 3	
Loading Code	1	
Loading Complete	1,4 steady 2,3 flash	

Errors:
No SD card, LED 1 and 2 flash.
"Connect" check that target is connected to PropPlug or check target power.

Schematic: PropLoaderSchematic.pdf

Source Code: PropLoader SourceCode.zip

Bill of Materials:

Company	part #	description
SchmartBoard	710-0005-02	Parallax Propeller SchmartModule
Digikey	X158-ND	5MHz Crystal
Digikey	24LC256-I/ST-ND	256kbit EEPROM
Digikey	P10KACT-ND	RES 10K OHM 1/8W 5% 0805 SMD
Parallax	4X20 Serial LCD	LCD Module 4x20 Serial (Backlit)
Parallax	32312	microSD breakout board
Ebay		256MB micro SD
Digikey	S5479-ND	4pin R/A Female Connector .100"
Digikey	EG4569-ND	pushbutton switch
Radio Shack	55039849	9v Battery
Radio Shack	270-324	9v Battery clip