

# Ugly Proteus: The many bugs of Proteus Simulation

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## Introduction

Proteus, from Labcenter Electronics, is a wonderful IDE for electronics that allows the simulation of schematics including sophisticated things like microcontrollers and a quite large set of digital and analog devices. And that's great!

But, the ugly thing about this is the many bugs these simulation models include. Bugs that you have to discover by yourself because they aren't listed on any errata sheet. Long time ago, if you were a legal customer with purchased licenses, you could send a bug-report e-mail to some support guy with the hope of that particular error being fixed for the next release, but things are no longer done this way. Now, you still have to be a legal customer but that only allows you to post your bug report to a forum where it is promptly redirected to /dev/null and nothing gets fixed. It seems to me that this is just a clever way to avoid the negative publicity about the public knowledge of bugs, and to keep the developers working on new features instead of fixing the issues of old ones.

I personally found quite a lot of these bugs, probably more that those listed here, and I want to write them down before forgetting them. So, lets start.

## ARM7 (LPC2103)

- ADC not simulated.
- External IRQs always level sensitive.
- No IDLE nor Power-Down modes.
- UART TX FIFO not simulated.
- UART RX Timeout interrupt not simulated.
- Delay from UART THR write to start bit is one character (when TX FIFO is empty). In the real UART this time is variable but less than one bit time.
- IO0PIN pin always read as 0 when configured as CAPx.x. IO0PIN must always show the logic levels of pins regardless of pin function or direction.

- Bit #1 of PC can be 1 for ARM7TDMI cores executing 32-bit instructions (ARM state). In simulations it is always 0. (Discovered thanks to student's unintended creativity about function pointers and complains about the real chip being at fault, not the simulator ;)
- Wrong source code disassembly in Thumb mode.

### **PIC12 (PIC10F200)**

- Data memory window with 128 bytes when the address space only allows 32 bytes.

### **dsPIC (dsPIC33F32GP203)**

- No pull-ups for change-notification inputs.
- MPY.N instruction fails.
- SFTAC instructions fails.
- Output Compare in PWM mode: wrong pulse for maximum width.
- Wrong INTTREG.

### **Alphanumeric LCD (Hitachi controller)**

- Address Counter fails to jump from address 39 to 64 and from address 103 to 0. It enters the forbidden memory areas at 40 to 63 and 104 to 127.
- 16x1 LCDs have an incorrect DDRAM mapping. Character at column #8 should be at address #64.