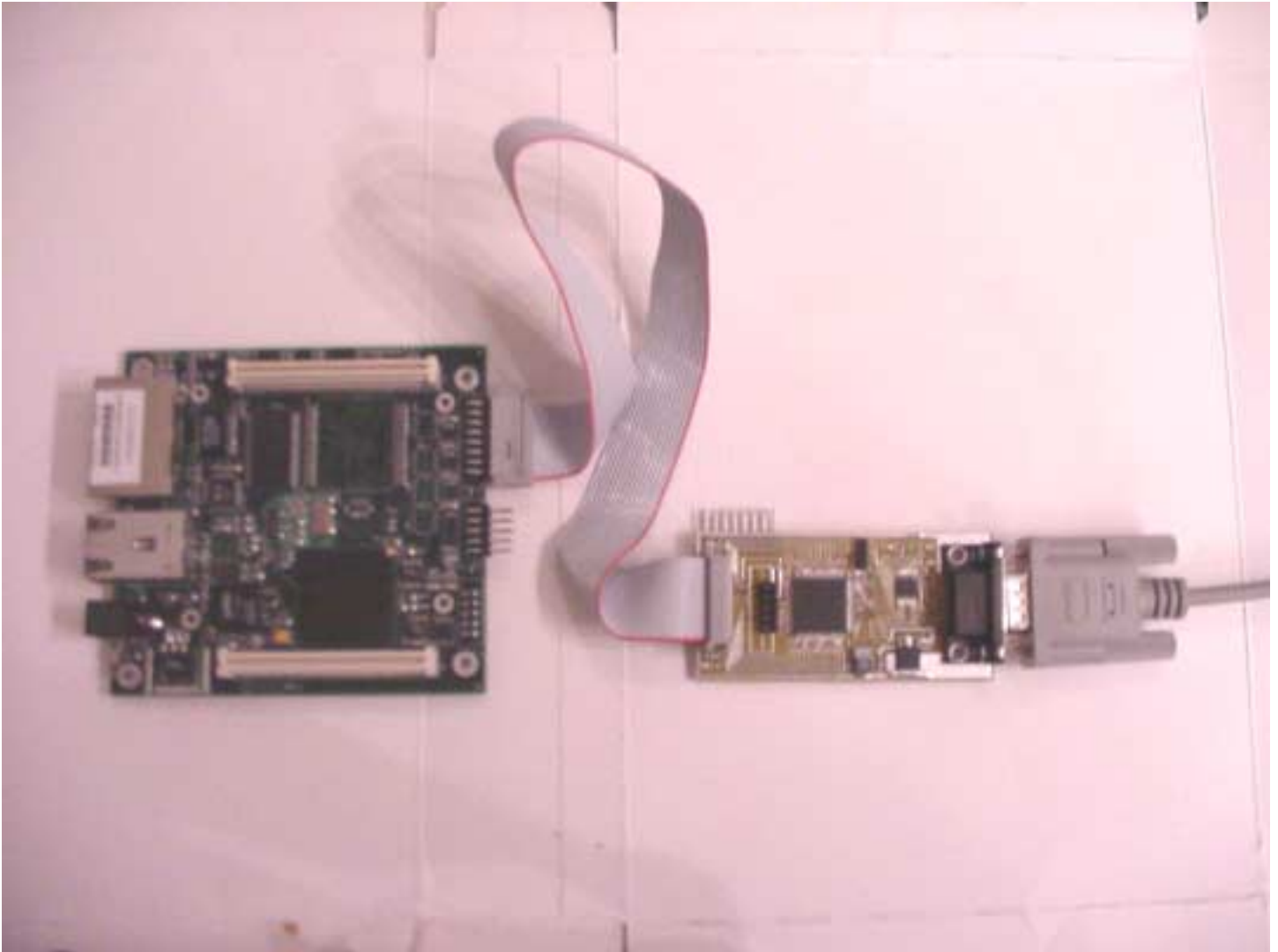


Nitro-Debugger



A Circuit Cellar/Motorola
Flash Innovation 2003 Contest Project

Project Name:

Nitro-Debugger

Project Number:

F195

Date:

24Jun03

Design Objective:

To design a Motorola Nitron based embedded system for the Circuit Cellar "Flash Innovation 2003" design contest.

Project Goals and Requirements:

1. Implement a unique and simple microprocessor debugger.
2. The debugger should aide in embedded system development and verification.
3. Provide real-time debugging at run-time with minimal target software intervention or support.
4. Extremely low cost.

Resulting project:

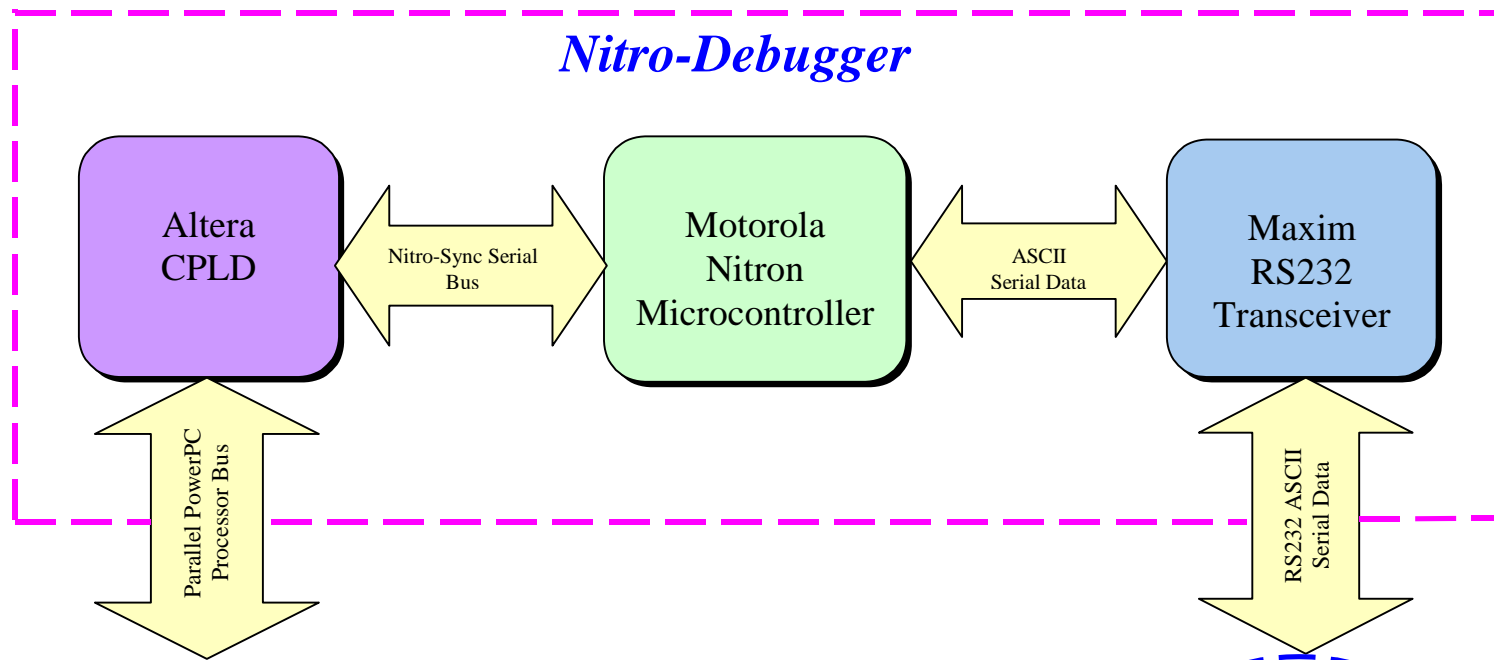
A microprocessor bus cycle translating, real-time debugger based upon the Motorola Nitron QY4 microcontroller.

System Abstract (See System Block Diagram)

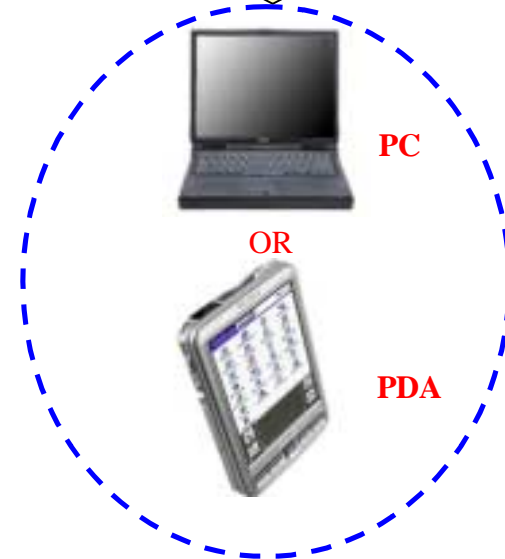
The Nitro-Debugger system is a small, non-intrusive debugging device that connects up to an external circuit board's microprocessor bus. It monitors, captures and then converts a single microprocessor bus cycle into useful data. This data is then displayed to the user via an ASCII terminal emulator (e.g. HyperTerminal in Windows) via an RS232 connection. The system works in conjunction with the target's software and allows the user to actually memory map the debugger. This allows the user to write to the debugger like a typical microprocessor peripheral. Once data is written to the debugger, it translates the bus cycle, converts the data to ASCII and then sends it to the terminal emulator. This gives the user a simple way of viewing system data while running in real-time. Of course, there are many families of microprocessors and all have different bus protocols. The first microprocessor protocol and bus that will be interfaced to will be the 32 bit Motorola PowerPC 860 family.

By implementing a non-intrusive debugger that requires very little target software support, a simple and effective real-time debugging solution has been achieved, as is the case with the Nitro-Debugger design.

System Block Diagram:



Motorola PowerPC Microprocessor target

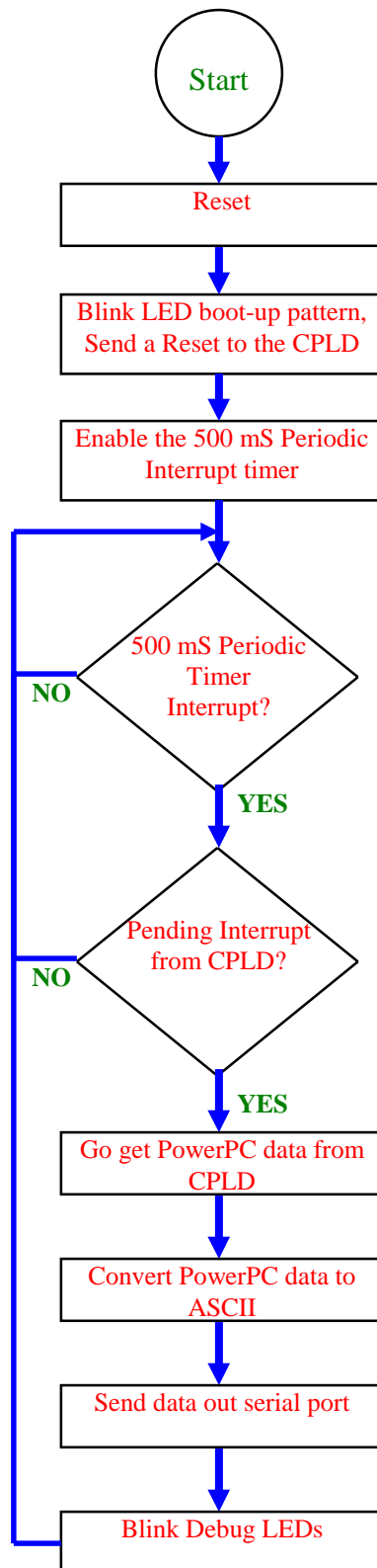


RS232 Enabled Monitoring device

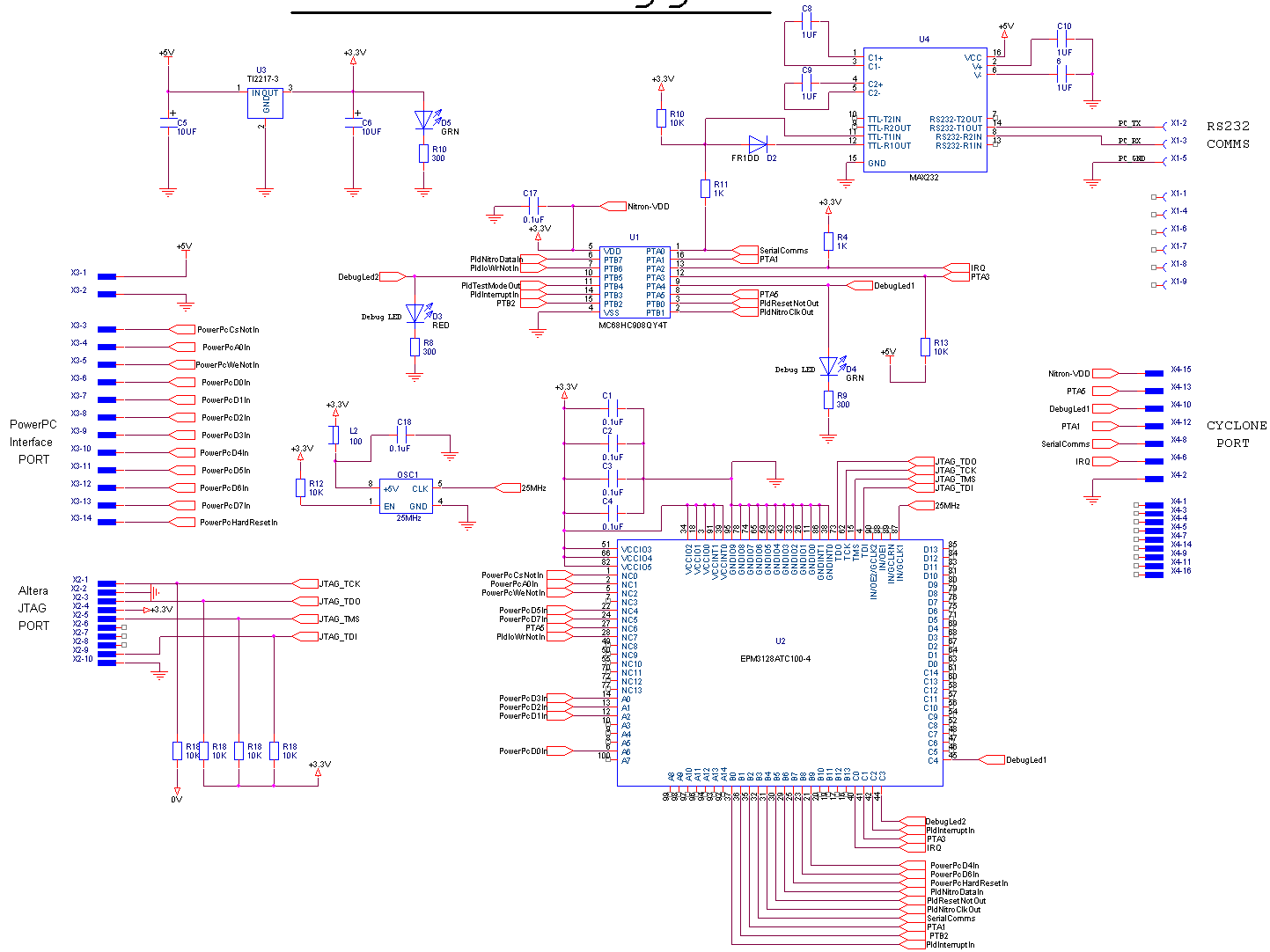


Firmware Description:

1.



Nitro-Debugger



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