PC User Interface of Peltier Cell Control Board

# Getting Started

## Introduction

This application is a graphical user interface for a microcontroller board based on Arduino technology. This application is meant to control the temperature of a Peltier Cell peripheral used to cool down an imager sensor used for astronomical photography.

This is a very light application consuming little resources and taking very little memory.

## System Requirements

System requirements for the Peltier\_GUI application are pretty little:

* Pentium III processor;
* 1GByte RAM;
* Microsoft .NET 3.5 Framework;
* 10MB Free space on hard-disk;

## License

# Software Architecture

## Firmware Architecture

The firmware running into the Arduino board is basically a command shell. It inspect the USB Channel (configured as Communication Device Channel CDC) awaiting for a string containing the command to execute and its parameter if needed. It executes then the command and returns the result.

To note that most of the commands perform an action on the board therefore they might not returns any information back to the PC, nevertheless to create a more robust application it is introduced a sort of ACK just to tell that the command ends without any error. In case of error the error message is sent back to the application.

The firmware might be seen as the Server into a Client-Server system.

## Application Architecture

The application is the client of the Client-Server paradigm. It generates some requests that are sent to the microcontroller board. The microcontroller board executes the request and eventually provides back some results that will be consumed.

The communication link between the PC and the microcontroller board is made via USB, whose port is configured to be managed as a Serial Port. Therefore all the COM-like command are used for the communication between the microcontroller board and the PC.