DSP PID Controller Board Bringup

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# Introduction

This document describes the bringup of the digital PID loop controller based on the Analog Devices Blackfin processor, and AKM semiconductor AK4556 A/D – D/A converter.

# Tool Chain

The board requires a Blackfin C/C++ compiler. Two choices are available: the VisualDSP++ v5.1.2 for Blackfin toolchain from Analog Devices (free 90-day trial, $5000USD purchase), and the open-source uClinux for Blackfin environment based on GNU gcc compiler and Eclipse.

This bringup will focus on the GNU toolchain.

## Gnu Toolchain

The uClinux toolchain is available from

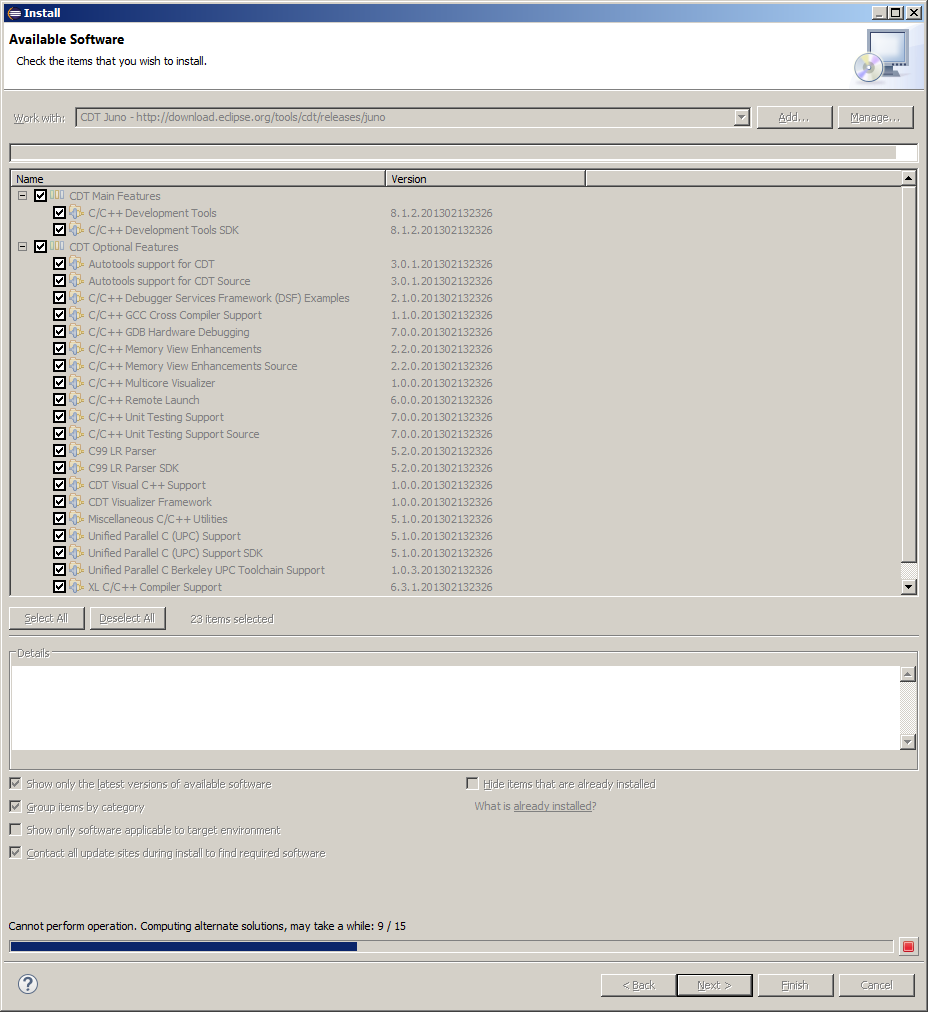
<https://sourceforge.net/projects/adi-toolchain/files/2014R1/2014R1_45-RC2/blackfin-toolchain-win32-2014R1_45.exe/download>.

## Eclipse

The interactive desktop environment (IDE) from Eclipse uses the GNU toolchain. Instructions are at <https://blackfin.uclinux.org/doku.php?id=toolchain:eclipse:install>

First download the current Eclipse for C/C++ at <http://www.eclipse.org/downloads/>.

Enable CDT tools



Add Blackfin plugins from <https://sourceforge.net/projects/adi-toolchain/files/eclipse/update_site/>

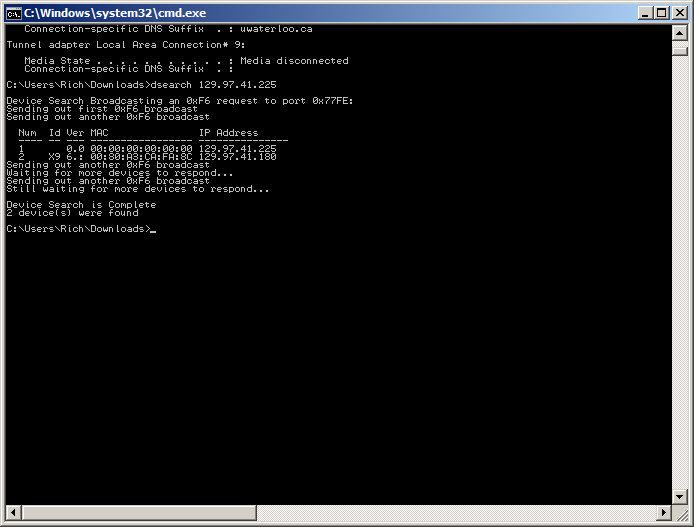
# Lantronix Bringup

The board uses a Lantronix XPort for serial communications.

## Download dsearch.exe

<http://www.lantronix.com/ftp/DeviceInstaller/Command-Line-Utilities/dsearch.exe>

The dsearch utility searches the local IP address range to find any Lantronix devices.



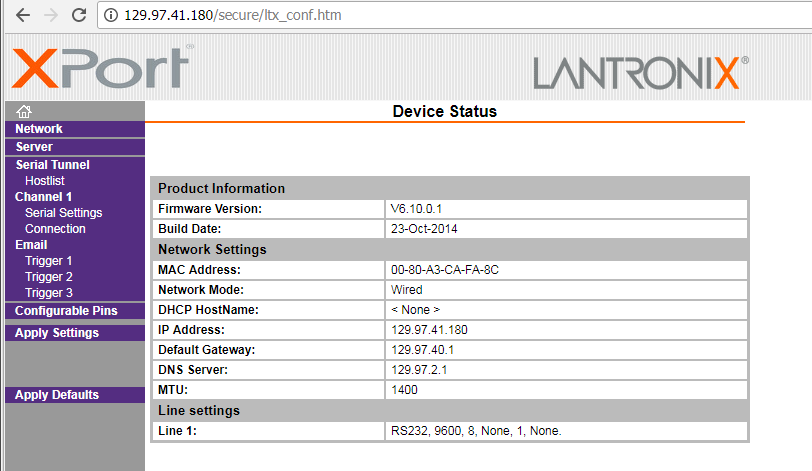
## Download DeviceInstaller.exe

<http://ltxfaq.custhelp.com/app/answers/detail/a_id/644?_ga=2.91684188.779030864.1522285128-459523226.1522285128>.

DeviceInstaller is used for setting static IP addresses. The Lantronix XPort has DHCP capabilities built-in, so if installed on a DHCP network use the dsearch.exe program.

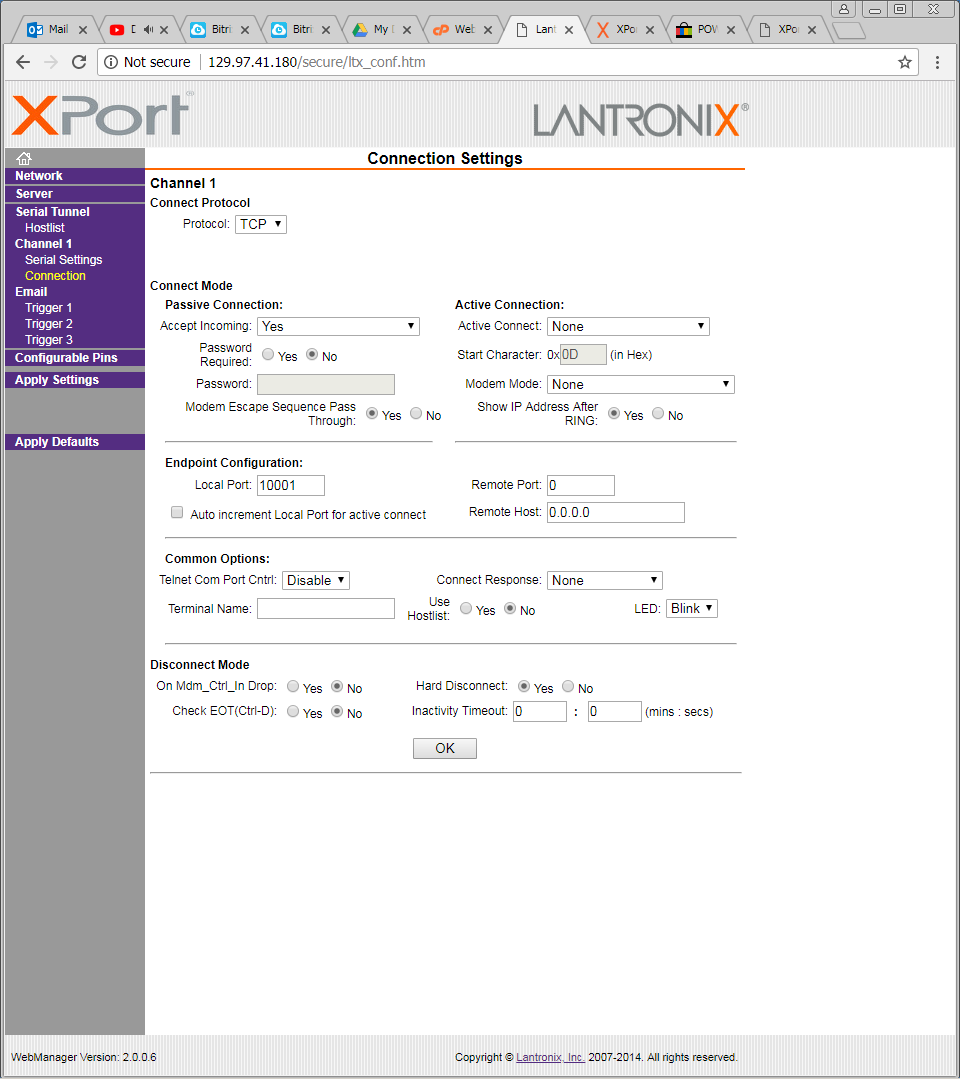
## Log into Lantronix XPort Web Manager

Using the device IP from dsearch.exe, log onto a web browser at this address. A brand-new Lantronix unit has **blank** username and password.

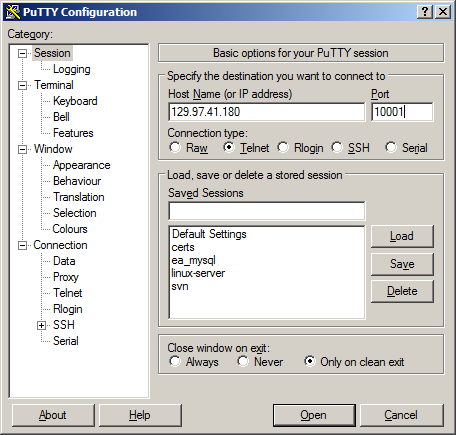


## Open Telnet Session

A telnet session can be used to connect to the Lantronix box to view and send serial messages to the DSP-PID board. The telnet port is non-standard, but can be viewed from the Lantronix web server.



Telnet session can be connected via any serial program, including PuTTY. Use the “Local Port” setting from the webserver.



## Using UART\_TEST VisualDSP++ project

This project is located at dsp\_pid.git\src\vdsp\_proj\test\_uart and contains a VisualDSP project to output the letter ‘a’ at 9600,8,N,1 baud rate. The debugger will halt when the processor receives any UART byte.