Introduction

- Dave Anders aka prpplague

Introduction

- Dave Anders aka prpplague
- Currently Contracted with TI

Introduction

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- Currently Contracted with TI

- Partners in TinCanTools

Introduction

- Dave Anders aka prpplague
- Currently Contracted with TI
- Partners in TinCanTools
- Open Tools for Board Bringup

Introduction

- Dave Anders aka prpplague
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- Open Tools for Board Bringup
  - Open Tools History

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- Open Tools for Board Bringup

  - Open Tools History

  - Open Hardware Solutions

Introduction

- Dave Anders aka prpplague

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- Open Tools for Board Bringup

  - Open Tools History

  - Open Hardware Solutions

  - Open Software Solutions

Open Tools History

- Open Tools in Science

Open Tools History

- Open Tools in Science
  - Experiments often require special tools

Open Tools History

- Open Tools in Science
  - Experiments often require special tools
  - New tools are shared with other scientists

Open Tools History

- Open Tools in Science

  - Experiments often require special tools

  - New tools are shared with other scientists
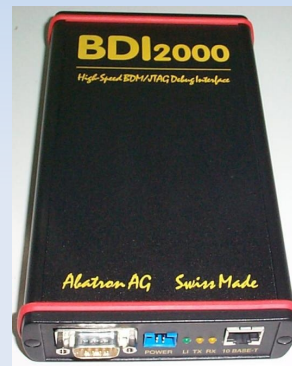
  - Robert Bunsen - Bunsen Burner

Open Tools History

- Open Tools in Science
- Commercial Solutions

Open Tools History

- Open Tools in Science
- Commercial Solutions

Open Tools History

- Open Tools in Science

- Commercial Solutions
  - MS Windows Operating Systems
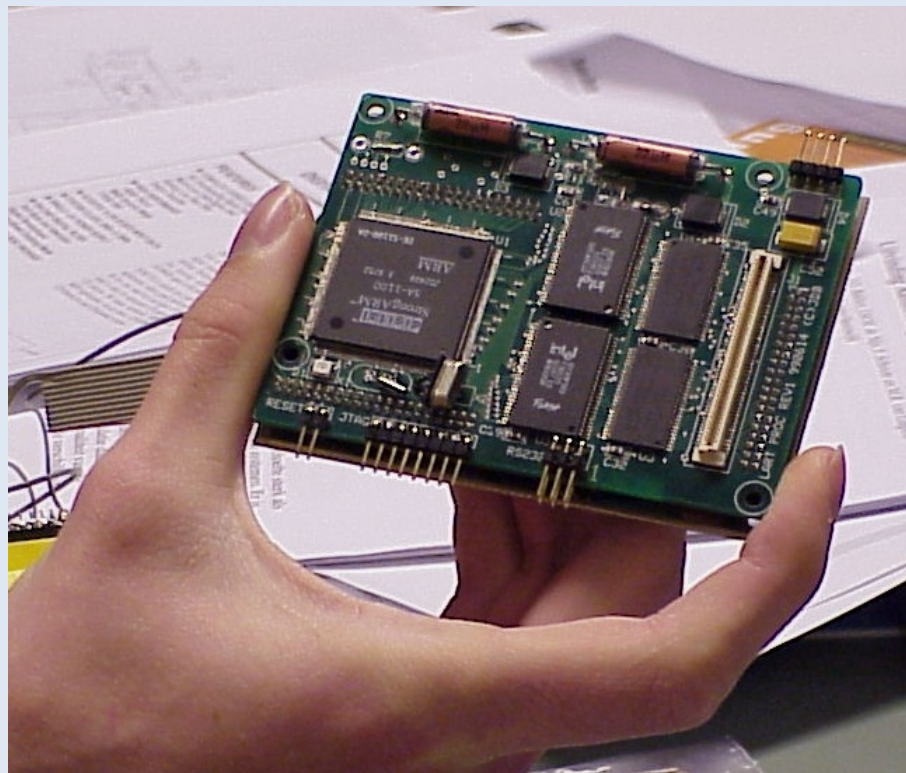
Open Tools History

- Open Tools in Science

- Commercial Solutions
    - MS Windows Operating Systems
    - Price

Open Tools History

- Open Tools in Science

- Commercial Solutions

  - MS Windows Operating Systems

  - Price

  - Features/Fixes

Open Tools History

- Open Tools in Science

- Commercial Solutions
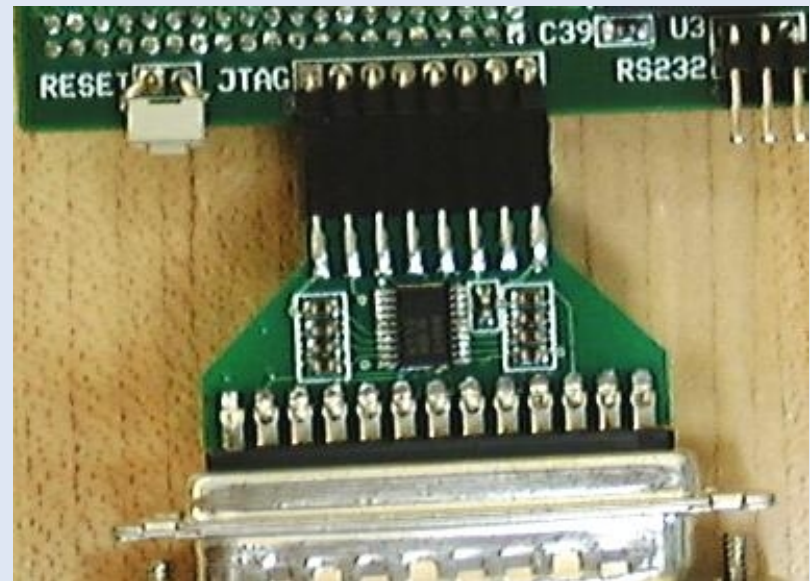
- LART Project

Open Tools History

- Open Tools in Science

- Commercial Solutions

- LART Project
    - Open Platform

Open Tools History

- Open Tools in Science

- Commercial Solutions

- LART Project

  - Open Platform

  - JTAG – Holly Gates Dongle
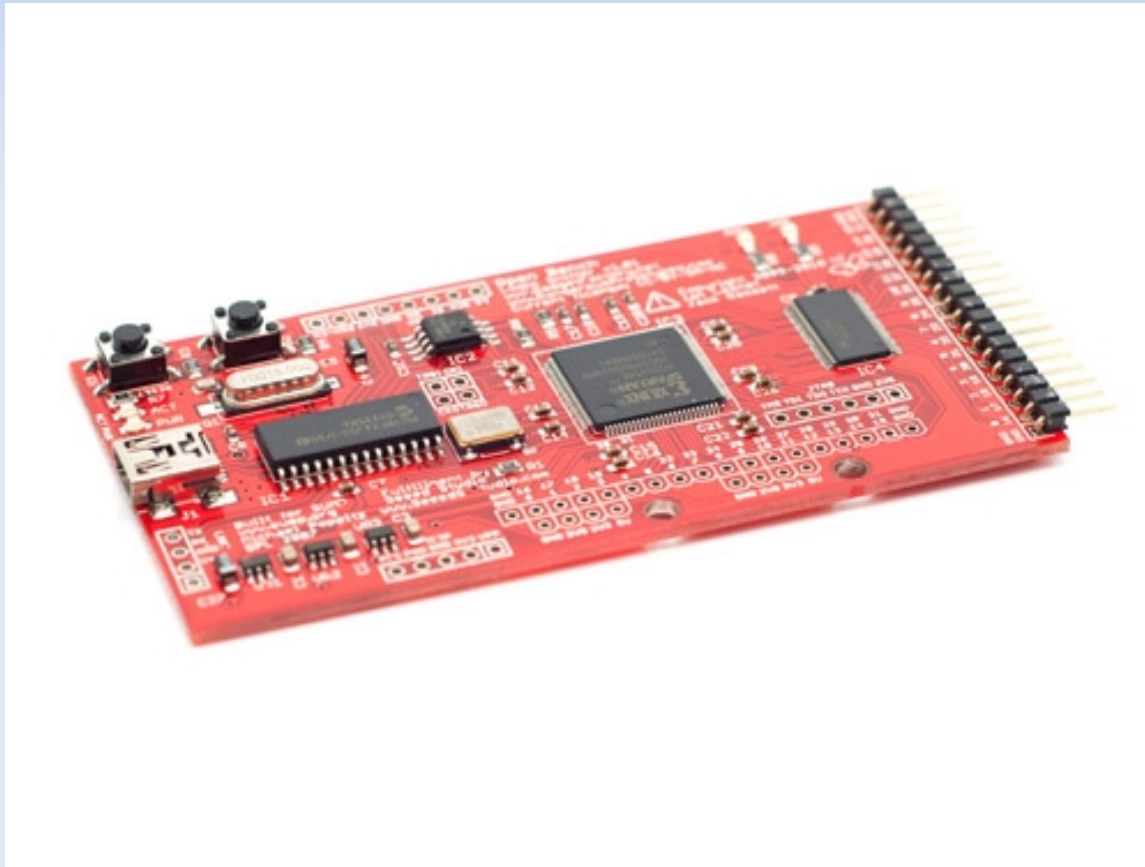
Open Tools History

- Open Tools in Science

- Commercial Solutions

- LART Project

  - Open Platform

  - JTAG – Holly Gates Dongle

  - Physical memory access - devmem2

Open Hardware Solutions

- Logic Analyzers

Open Hardware Solutions

- Logic Analyzers
  - Open Workbench Logic Sniffer
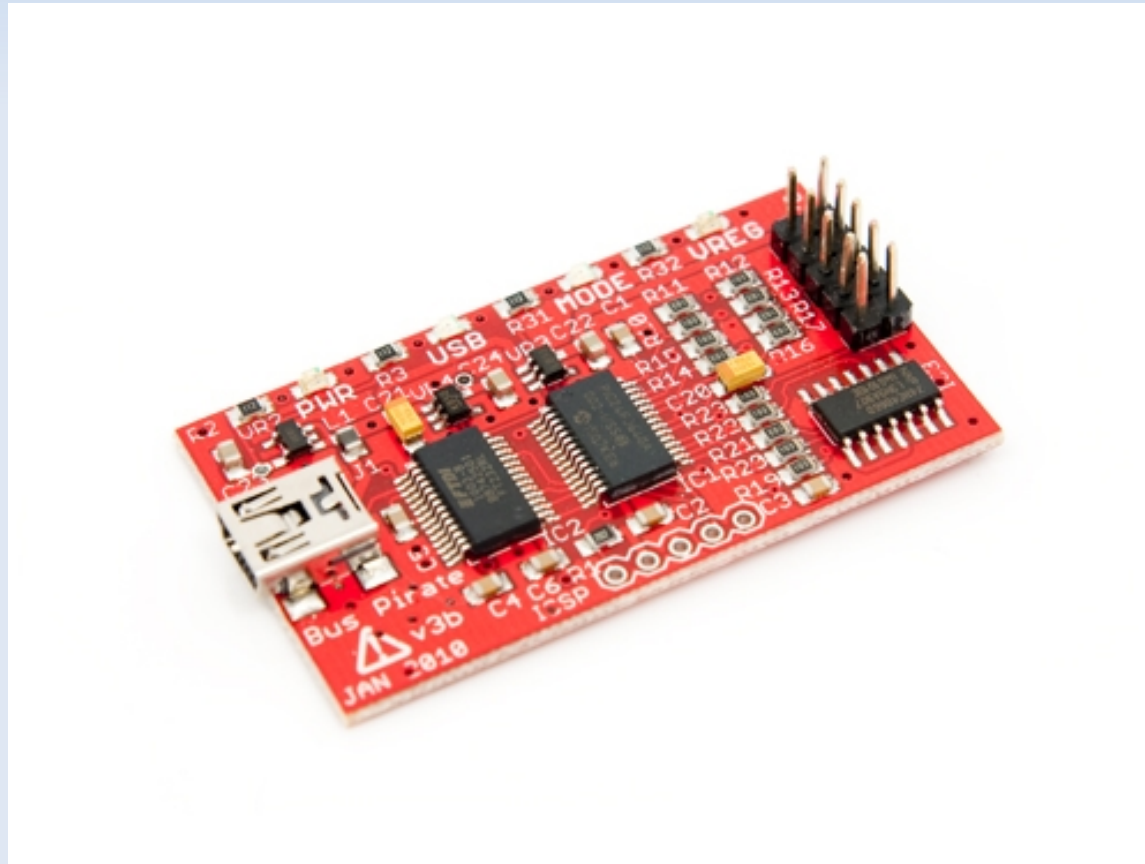
Open Hardware Solutions

- Logic Analyzers
  - Open Workbench Logic Sniffer
    - 70MHz+ sample speeds
    - 32 channels
    - 16 buffered, 5volt tolerant channels
    - USB interface, USB powered
    - USB upgradable everything
    - Make it as DIY as possible
    - $30-$40 price range

Open Hardware Solutions

- Logic Analyzers
  - Open Workbench Logic Sniffer
  - Bus Pirate

Open Hardware Solutions
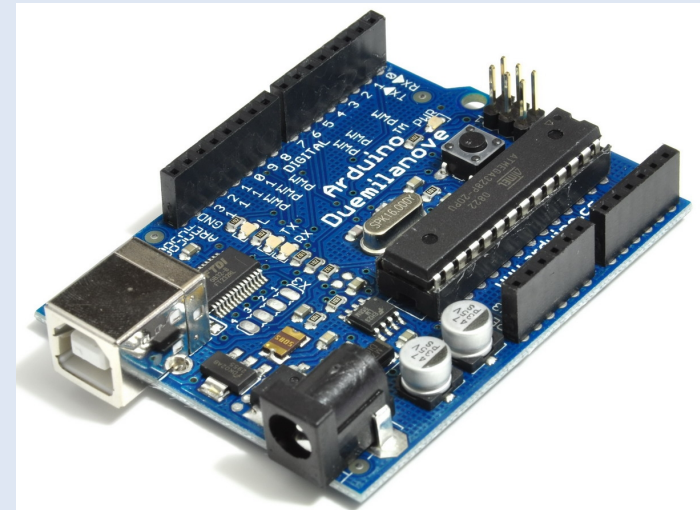
- Logic Analyzers
  - Open Workbench Logic Sniffer
  - Bus Pirate
    - 1-Wire
    - I2C
    - SPI
    - JTAG
    - Asynchronous serial
    - 2- and 3-wire libraries with bitwise pin control
    - Scriptable binary bitbang, 1-Wire, I2C, SPI, and UART modes

Open Hardware Solutions

- Logic Analyzers
  - Open Workbench Logic Sniffer
  - Bus Pirate
  - AVR/Arduino

Open Hardware Solutions

- Logic Analyzers
  - Open Workbench Logic Sniffer
  - Bus Pirate
  - AVR/Arduino (Insert Arduino Jokes Here)

Open Hardware Solutions

- Logic Analyzers

- Oscilloscopes

Open Hardware Solutions

- Logic Analyzers

- Oscilloscopes
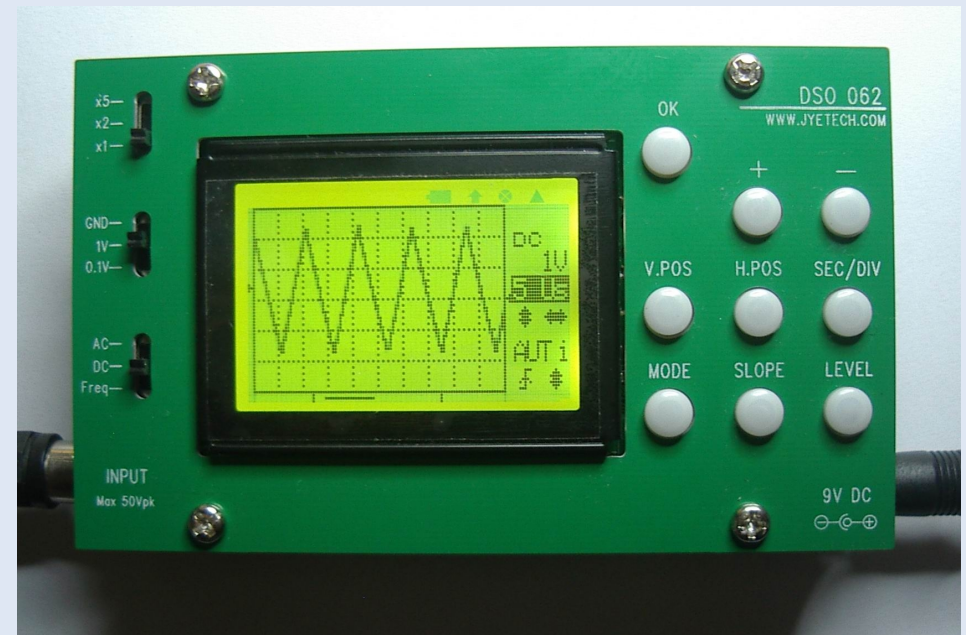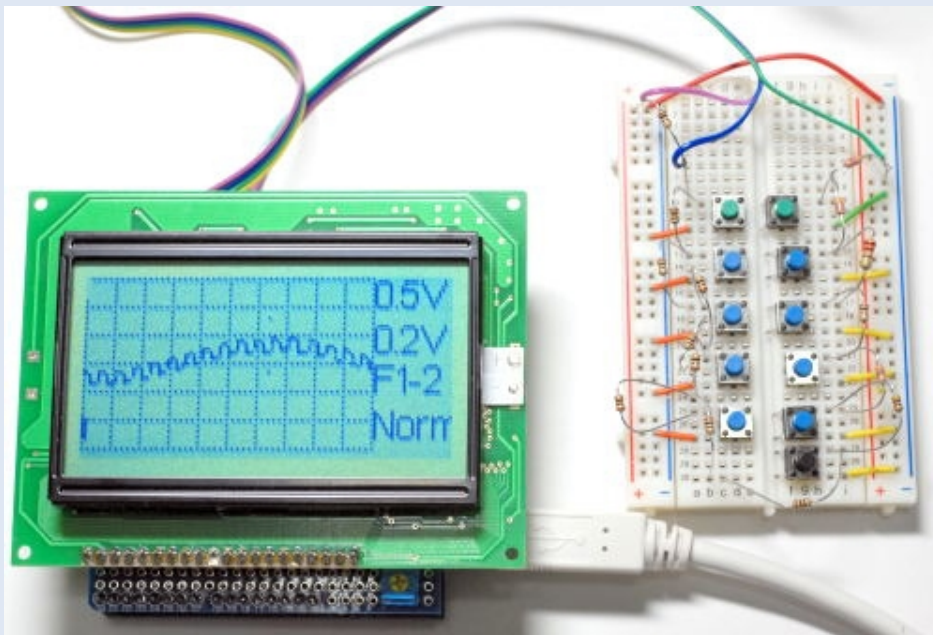
  - Nano-DSO

Open Hardware Solutions

- Logic Analyzers

- Oscilloscopes

    - Nano-DSO

        - Based on ARM Cortex™-M3 compatible 32 bit platform
        - Unibody PCB design for better reliability
        - Portable and lightweight with 320x240 color LCD
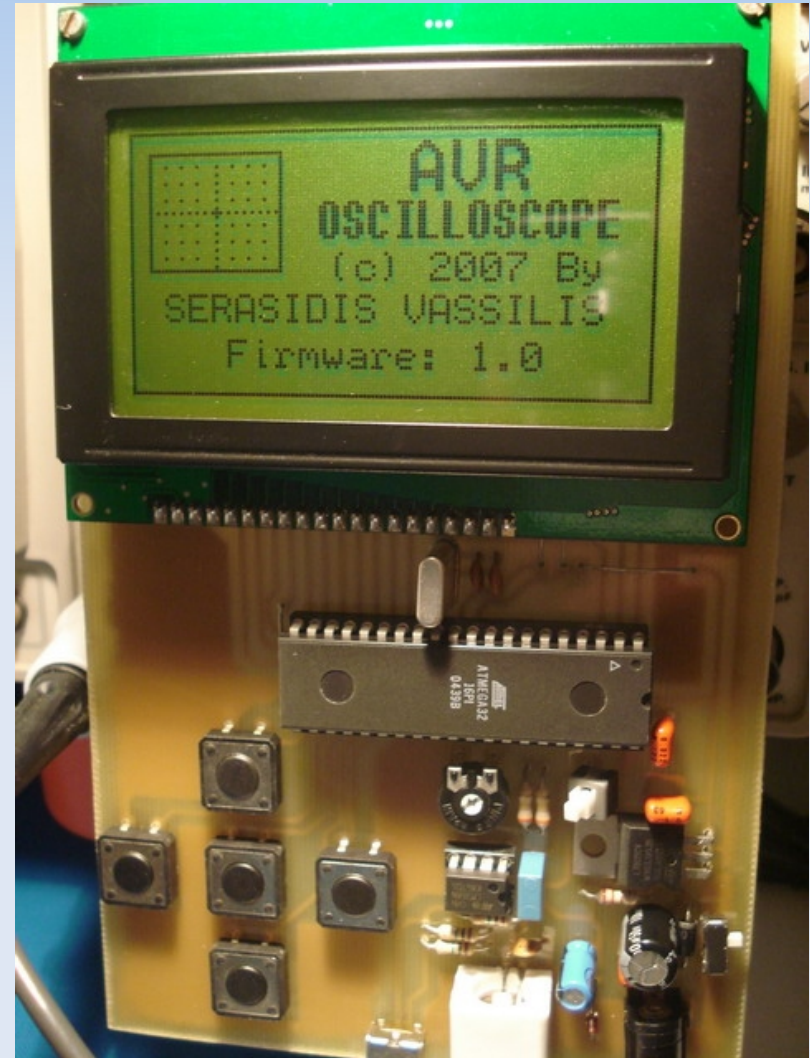   - Built-in Signal Generator
        - 6 triggering mode

Open Hardware Solutions

- Logic Analyzers

- Oscilloscopes

  - Nano-DSO

  - AVR and Arduino (Insert More Arduino Jokes here)

Open Hardware Solutions

- Logic Analyzers

- Oscilloscopes
  - Nano-DSO
  - AVR and Arduino
  - PIC Based

Open Hardware Solutions

- Logic Analyzers
- Oscilloscopes
- JTAG

Open Hardware Solutions

- Logic Analyzers

- Oscilloscopes

- JTAG

  - FT2232
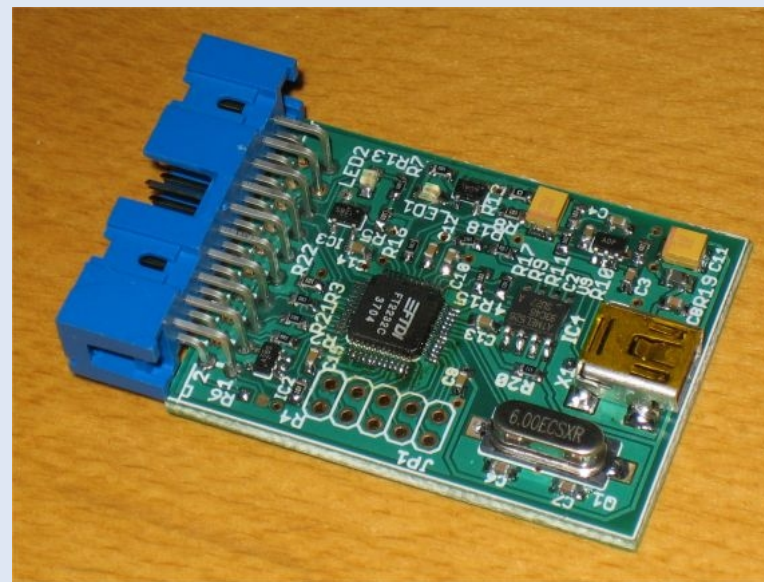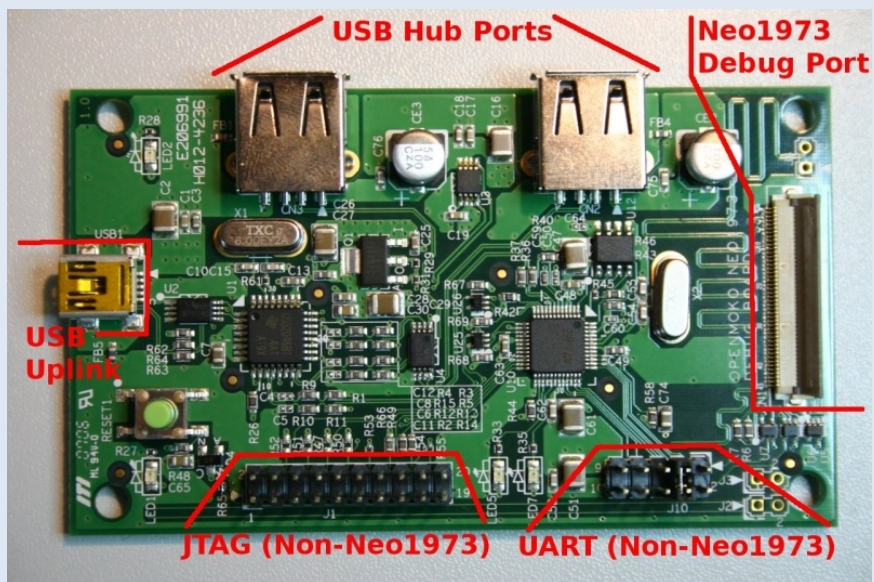
Open Hardware Solutions

- Logic Analyzers

- Oscilloscopes

- JTAG

  - FT2232

    - JTAG

    - I2C

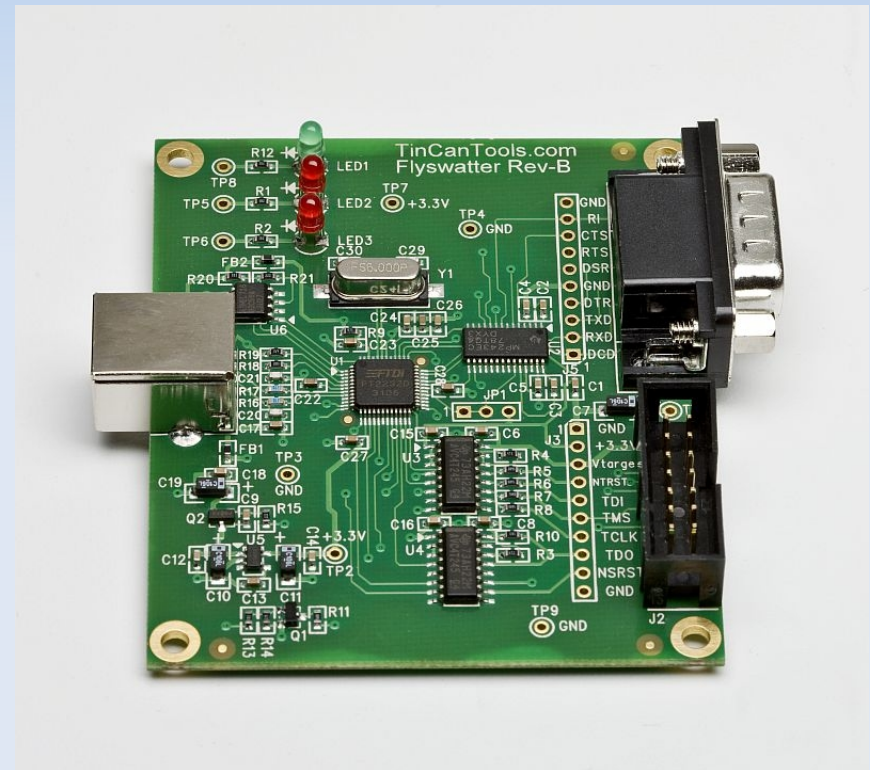   - SPI

    - UART

    - GPIO

    - Open LIBS

Open Hardware Solutions

- Logic Analyzers

- Oscilloscopes

- JTAG

    - FT2232

    - Generic devices

Open Hardware Solutions

- Logic Analyzers

- Oscilloscopes

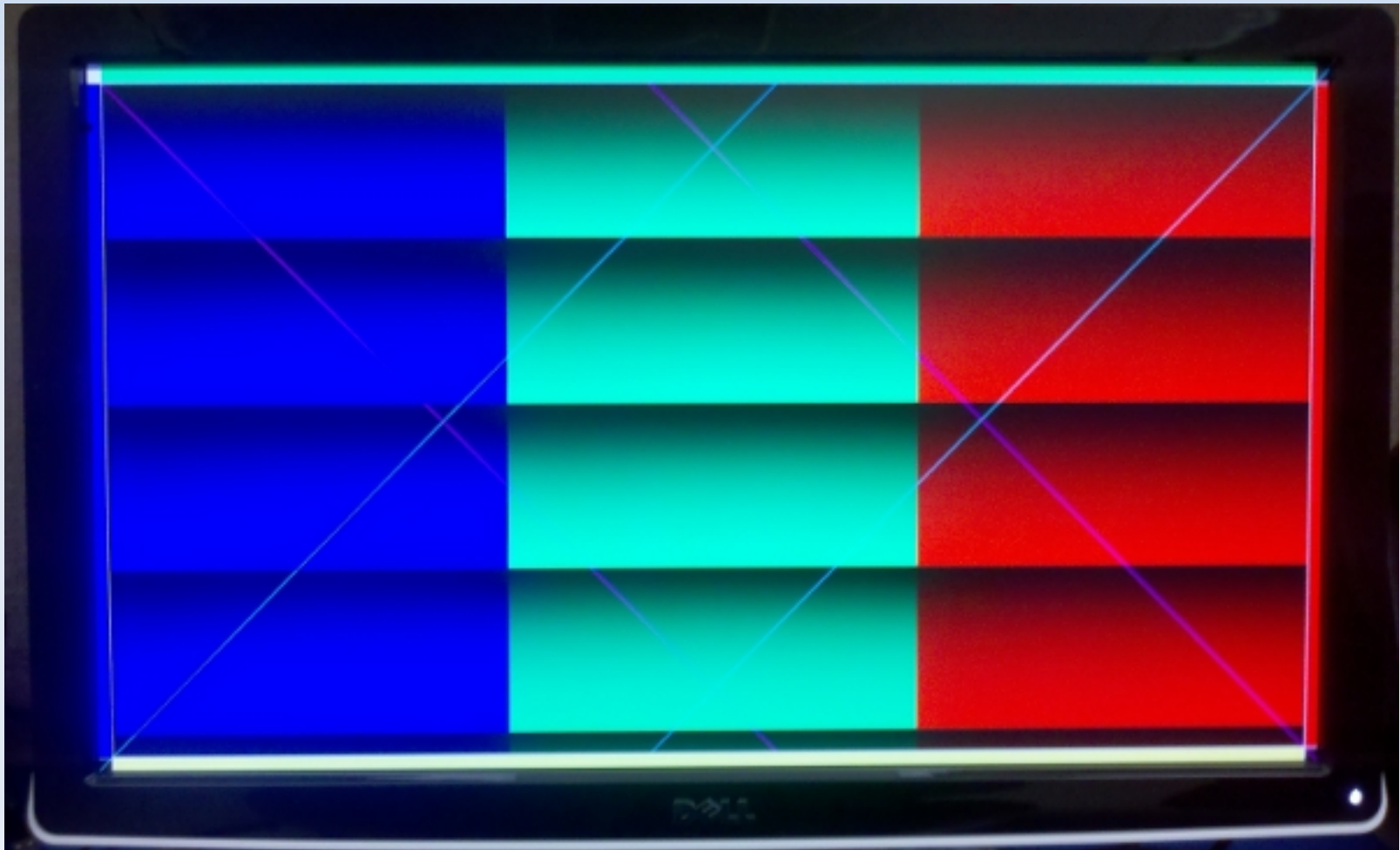- JTAG

  - FT2232

  - Generic devices

  - Flyswatter

Open Software Solutions

- Platform Based

Open Software Solutions

- Platform Based
  - fb-test

Open Software Solutions

- Platform Based
  - fb-test
  - evtest

Input driver version is 1.0.1
Input device ID: bus 0x3 vendor 0x47d product 0x1029 version 0x110
Input device name: "Kensington   USB/PS2 Wheel Mouse"
Supported events:
  Event type 0 (Sync)
  Event type 1 (Key)
    Event code 272 (LeftBtn)
    Event code 273 (RightBtn)
    Event code 274 (MiddleBtn)
    Event code 275 (SideBtn)
    Event code 276 (ExtraBtn)
  Event type 2 (Relative)
    Event code 0 (X)
    Event code 1 (Y)
    Event code 8 (Wheel)
  Event type 4 (Misc)
    Event code 4 (ScanCode)
Testing ... (interrupt to exit)

Open Software Solutions

- Platform Based

    - fb-test

    - evtest

```
ITesting ... (interrupt to exit)
Event: time 1302309754.917080, type 2 (Relative), code 0 (X), value 1
Event: time 1302309754.917087, -------------- Report Sync ------------
Event: time 1302309756.837092, type 2 (Relative), code 0 (X), value -1
Event: time 1302309756.837099, -------------- Report Sync ------------
Event: time 1302309756.845079, type 2 (Relative), code 0 (X), value -3
Event: time 1302309756.845086, -------------- Report Sync ------------
Event: time 1302309756.853079, type 2 (Relative), code 0 (X), value -4
Event: time 1302309756.853083, type 2 (Relative), code 1 (Y), value 1
Event: time 1302309756.853086, -------------- Report Sync ------------
Event: time 1302309756.861079, type 2 (Relative), code 0 (X), value -5
Event: time 1302309756.861083, type 2 (Relative), code 1 (Y), value 1
Event: time 1302309756.861086, -------------- Report Sync ------------
Event: time 1302309756.869078, type 2 (Relative), code 0 (X), value -7
Event: time 1302309756.869083, type 2 (Relative), code 1 (Y), value 1
```

Open Software Solutions

- Platform Based
  - fb-test
  - evtest
  - devmem2

Open Software Solutions
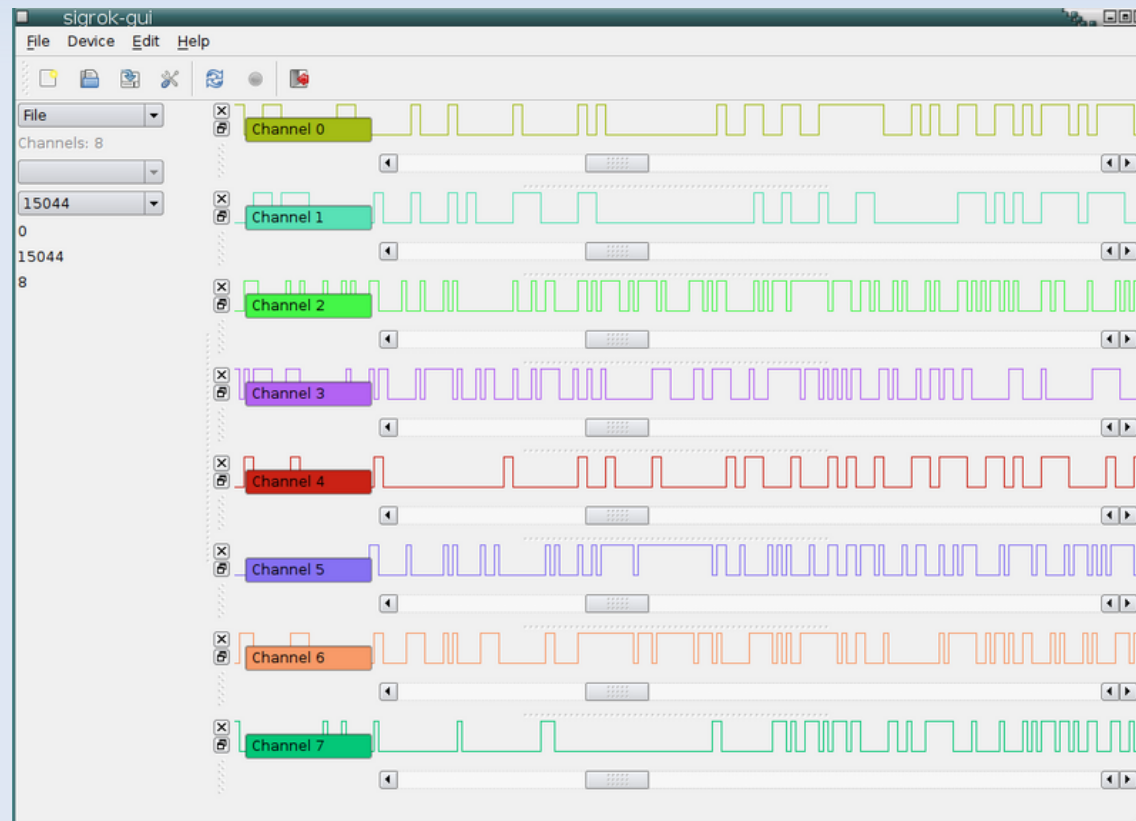
- Platform Based

  - fb-test

  - evtest

  - devmem2

        - Vendor variations

        - Busybox

        - Buildroot

        - OE

Open Software Solutions

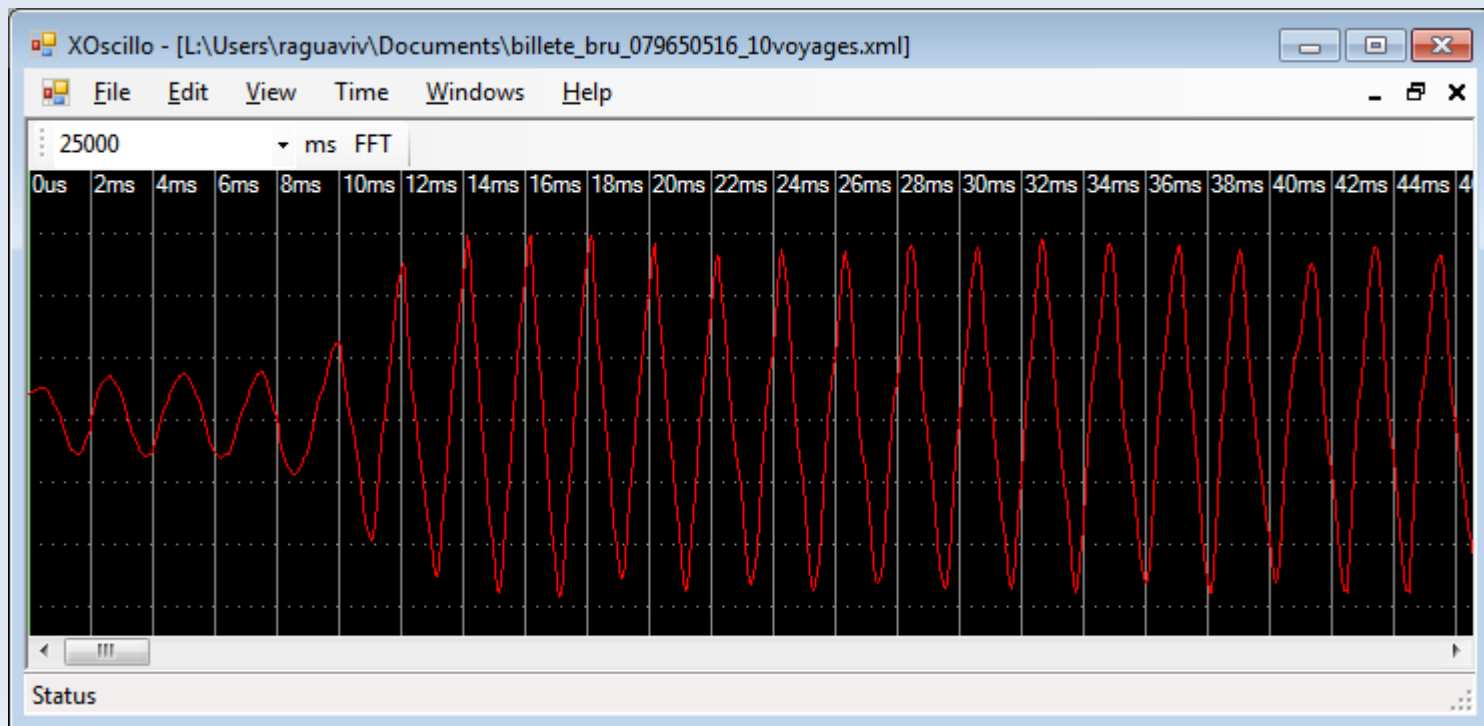- Platform Based

- Host Based

Open Software Solutions

- Platform Based

- Host Based
  - Logic Analyzer - Sigrok

Open Software Solutions

- Platform Based

- Host Based

  - Logic Analyzer – Sigrok

  - Oscilloscope - XOscillo
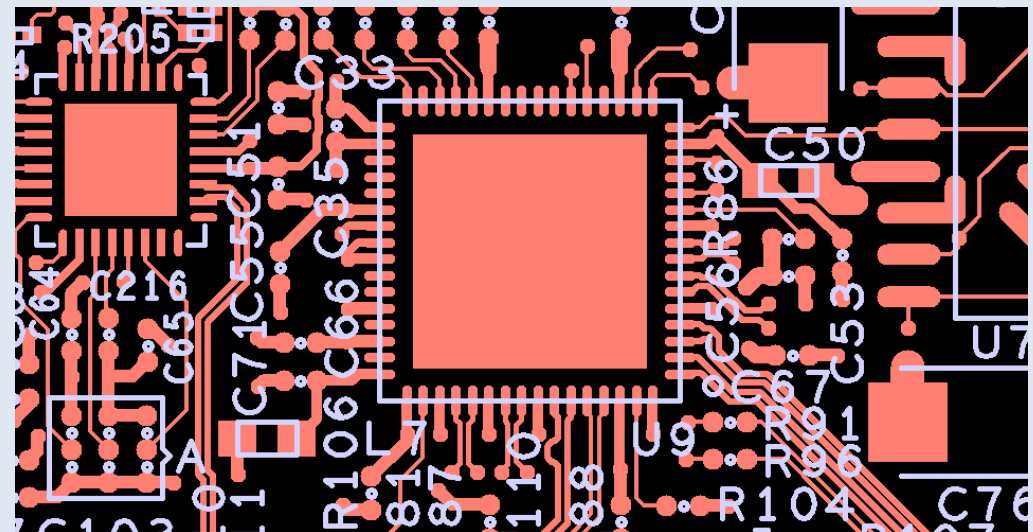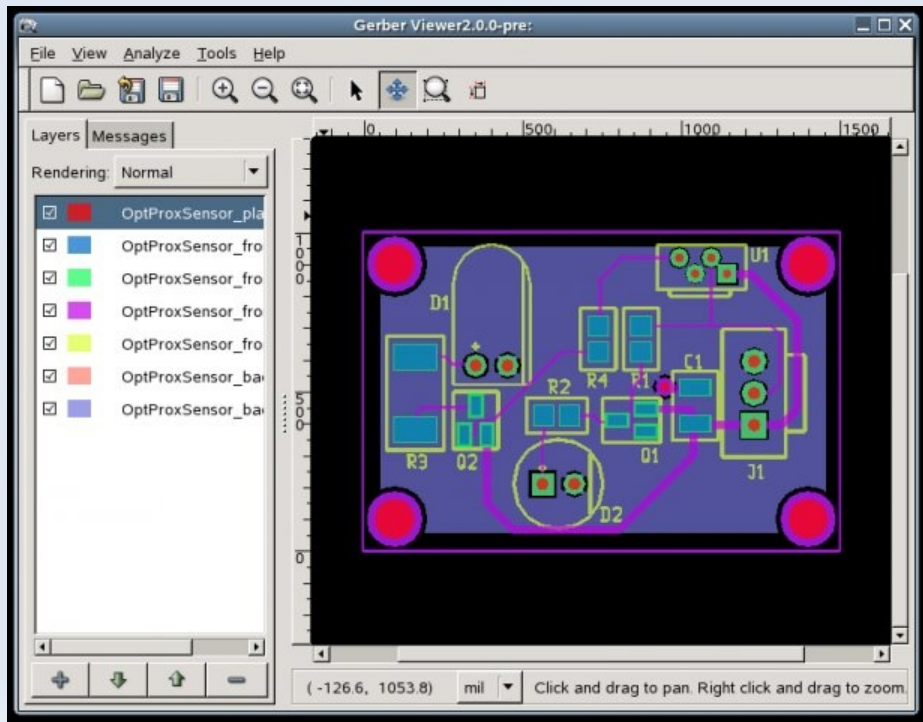
Open Software Solutions

- Platform Based

- Host Based

  - Logic Analyzer – Sigrok

  - Oscilloscope – XOscillo

  - JTAG - OpenOCD

Open Software Solutions

- Platform Based
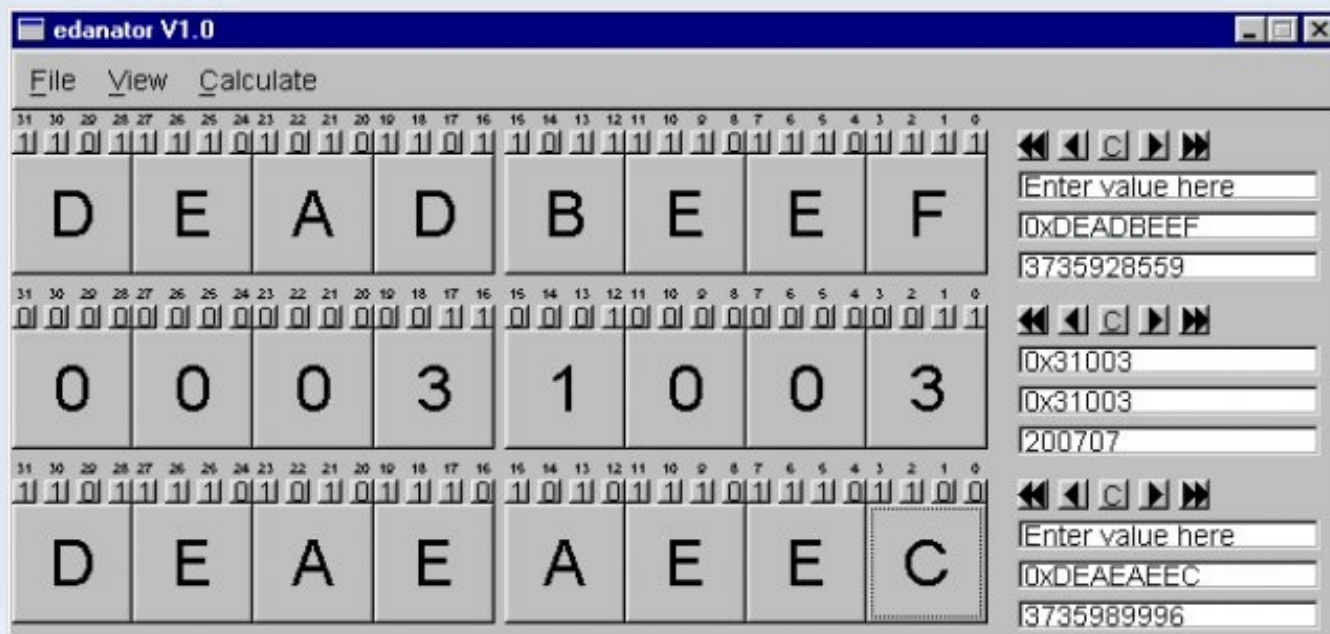
- Host Based

- Desktop Utilities

Open Software Solutions

- Platform Based

- Host Based

- Desktop Utilities
  - Gerbv

Open Software Solutions

- Platform Based

- Host Based

- Desktop Utilities
    - Gerbv
    - Edanator

Open Software Solutions

- Platform Based

- Host Based

- Desktop Utilities

  - Gerbv

  - Edanator

  - GUVCView

Conclusion

- Long History of Open Tools

Conclusion

- Long History of Open Tools
- Open Hardware Tools

Conclusion

- Long History of Open Tools

- Open Hardware Tools

- Open Software Tools

Conclusion

- Long History of Open Tools

- Open Hardware Tools

- Open Software Tools

- Incentive to contribute

Conclusion

- Long History of Open Tools

- Open Hardware Tools

- Open Software Tools

- Incentive to contribute

- Transition to open tools

Conclusion

- Long History of Open Tools

- Open Hardware Tools

- Open Software Tools

- Incentive to contribute

- Transition to open tools

- Documentation

  - Http://www.elinux.org/open_tools

Conclusion

Questions?