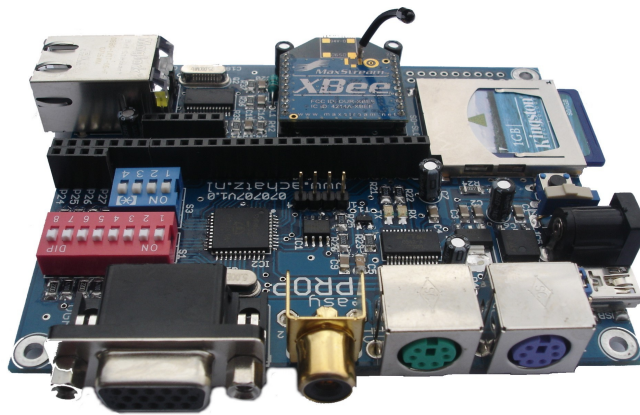


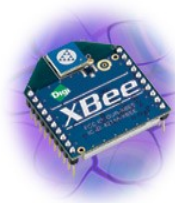
USER'S MANUAL

easyPROP

easy to use Propeller™ board



Ethernet
10BASE-T



Composite
Video

PS/2
Keyboard

PS/2
Mouse

VGA
Display

Rel. 1.20

Published by Franz Achatz

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Other product names listed are trademarks of their respective companies.

For specific information on the components mounted on the board, please refer to the Data Book of the builder or second sources.

About the easyPROP

EasyPROP is a low priced Propeller™ based Evaluation Board equipped with an Ethernet Interface, SD Memory, VGA, TV Video, Audio, PS2 Keyboard, PS2 Mouse, XBEE connector and a USB Interface. It can be powered using a universal AC-DC Adapter or via your USB cable. The Port pins P0 – P27 are available for your application at the on-board pin headers. The VGA and TV Video Pins can be disabled by the DIL switches if needed for a different application.

EasyPROP is powered by the new Parallax Propeller™ P8X32-A which holds eight 32-bit processors in one chip. The Propeller chip must be programmed in Spin™ and assembly language. A lot of pre-built Parallax objects for Data Storage, Display, Protocol, Motor Control, Signal Generation, Human Input, Math, Sensor, Speech and Sound can be downloaded from the Parallax Website.

The Propeller Tool Software includes all needed software, source code, USB driver and the Propeller Manual. Just take a look at the Parallax Website and get this powerful software package as a free download.

With this combination (easyPROP + Objects + Tool Software) you can discover the power of the Propeller and do your first Propeller steps within hours.

Useful links:

Parallax Website

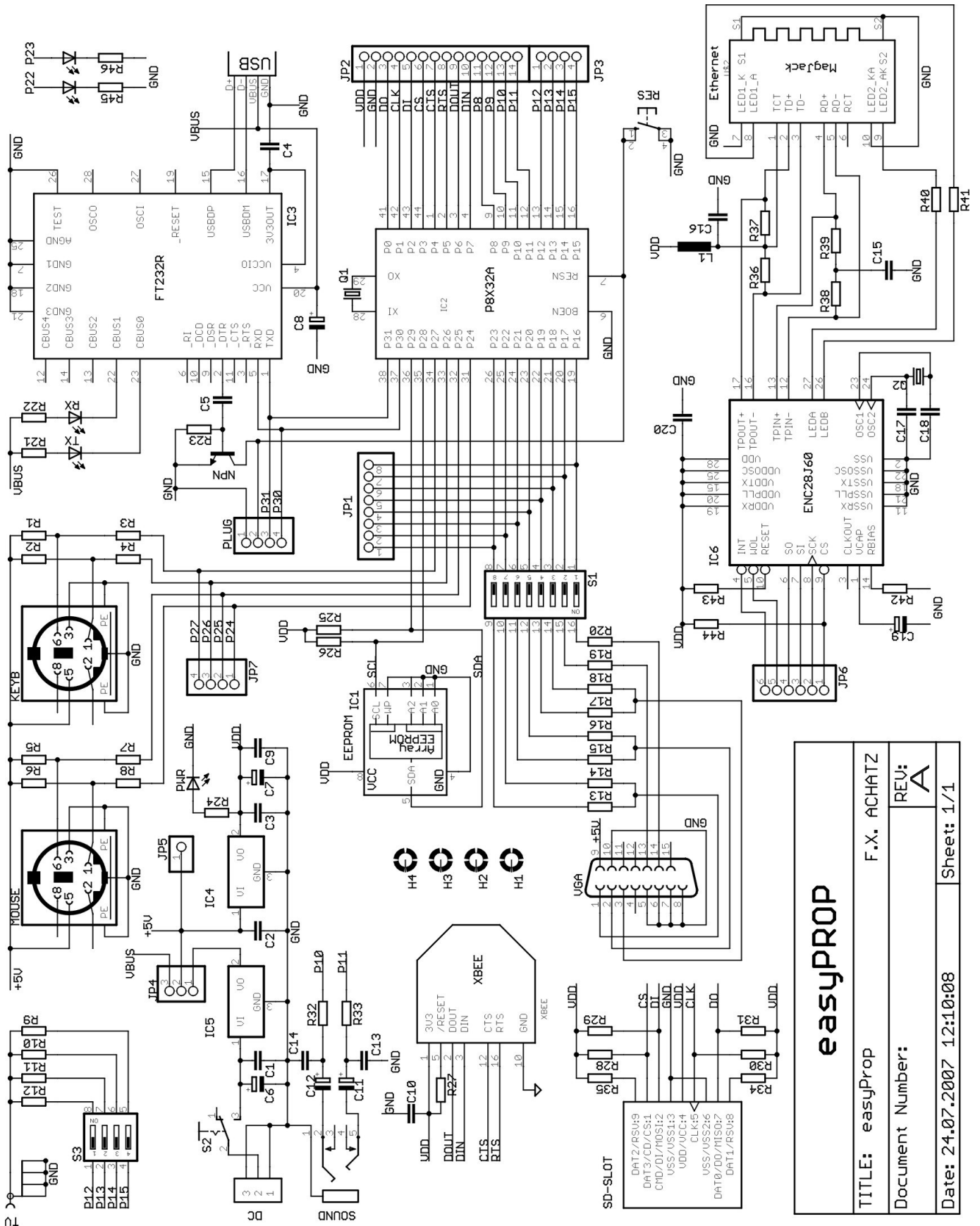
<http://www.parallax.com/>

Object Exchange

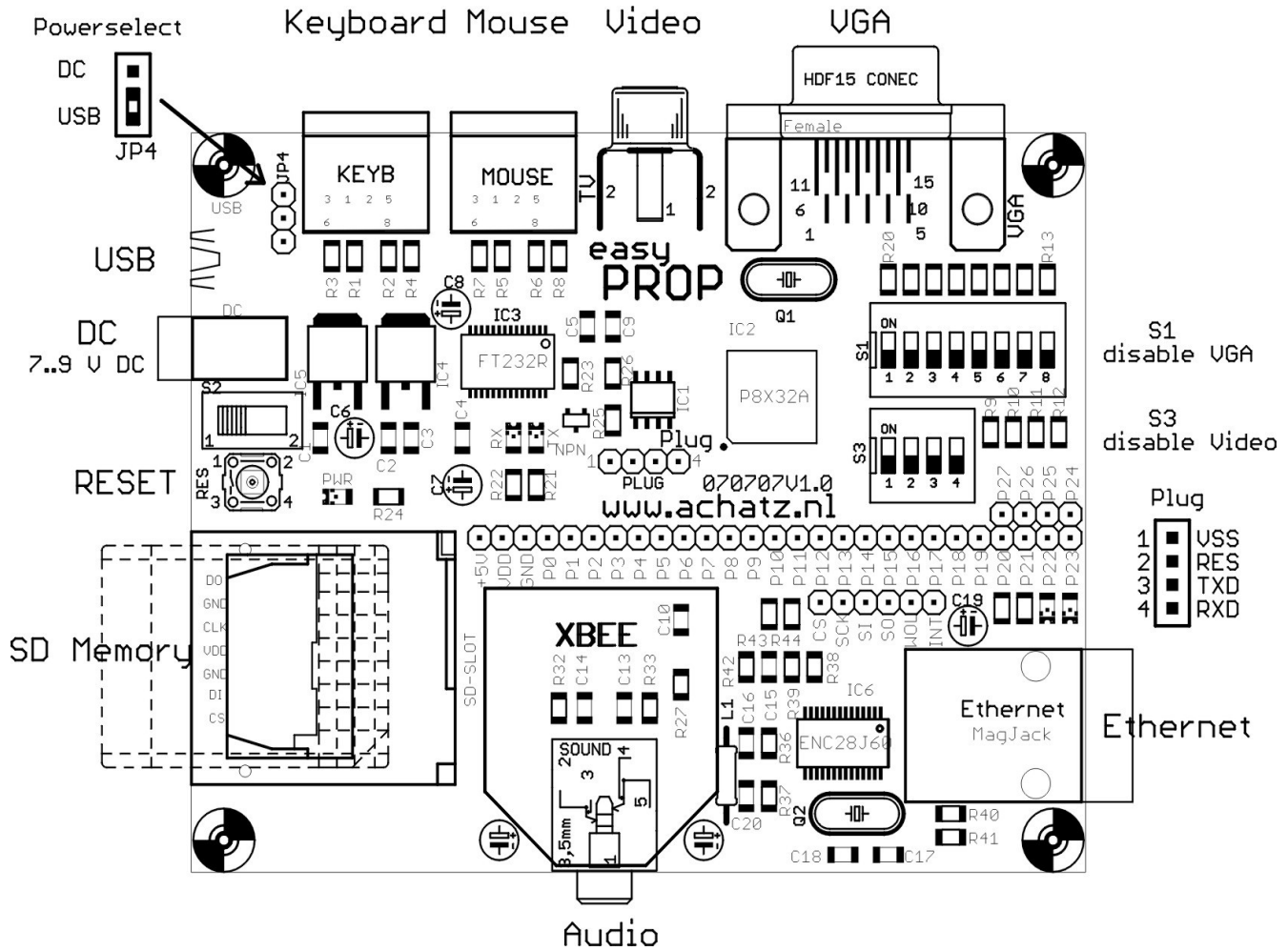
<http://obex.parallax.com/>

Discussion Forums

<http://forums.parallax.com/forums/default.aspx>



easyPROP	
TITLE: easyProp	F.X. ACHATZ
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Technical Data:

- P8X32A-Q44 Propeller Chip with external XTAL 5 MHz
- 32 kB EEPROM for program and data storage
- Audio Connector
- SD Memory Slot
- USB Programming Interface
- Ethernet ENC28J60 Interface
- XBEE Module (optional)
- Power via USB
- Power via Barrel Connector (6 ...9 V DC, 300 mA)
- VGA and TV Video Interface
- PS/2 Mouse Interface
- PS/2 Keyboard Interface
- Port Pins P0...P27 available via Pinheader
- Reset Switch
- User LEDs for P22 and P23
- VGA and Video can be disabled via the DIP Switches
- Board dimensions 80x100 mm

Parts list:

C1	100 nF
C2	100 nF
C3	100 nF
C4	100 nF
C5	10 nF
C6	10 μ F
C7	470 μ f
C8	10 μ F
C9	100 nF
C10	100 nF
C11	1 μ F
C12	1 μ F
C13	10 nF
C14	10 nF
C15	10 nF
C16	10 nF
C17	22 pF
C18	22 pF
C19	10 μ F
C20	100 nF
DC	Barrel CON
IC1	24C256
IC2	P8X32A
IC3	FT232RL
IC4	2937-3.3
IC5	2937-5
IC6	ENC28J60
KEYB	MINI_DIN_6
L1	100 μ H
MOUSE	MINI_DIN_6
NPN	BC847
PLUG	PINHD-1X4
PWR	SMD LED 1206
PWR1	SMD LED 1206
PWR2	SMD LED 1206
Q1	5 MHz
Q2	25 MHz

R1	10 k Ω
R2	10 k Ω
R3	120 Ω
R4	120 Ω
R5	10 k Ω
R6	10 k Ω
R7	120 Ω
R8	120 Ω
R9	470 Ω
R10	220 Ω
R11	470 Ω
R12	1 k Ω
R13	220 Ω
R14	470 Ω
R15	220 Ω
R16	470 Ω
R17	220 Ω
R18	470 Ω
R19	220 Ω
R20	220 Ω
R21	120 Ω
R22	120 Ω
R23	10 k Ω
R24	220 Ω
R25	10 k Ω
R26	10 k Ω
R27	10 k Ω
R28	10 k Ω
R29	10 k Ω
R30	10 k Ω
R31	10 k Ω
R32	10 k Ω
R33	10 k Ω
R34	10 k Ω
R35	10 k Ω
R36	51 Ω
R37	51 Ω
R38	51 Ω
R39	51 Ω
R40	220 Ω

R41	220 Ω
R42	2,2 k Ω
R43	10 k Ω
R44	10 k Ω
R45	220 Ω
R46	220 Ω
RES	10-XX
RX	SMD LED 1206
S1	DS08
S2	255SB
S3	DS04
SD-SLOT	Push-Pull slot
SOUND	PG203J
TV	TOBU3
TX	SMD LED 1206
Ethernet	MAGJACK
USB	USB-MB-S
VGA	F15HDH
XBEE	XBEE Module

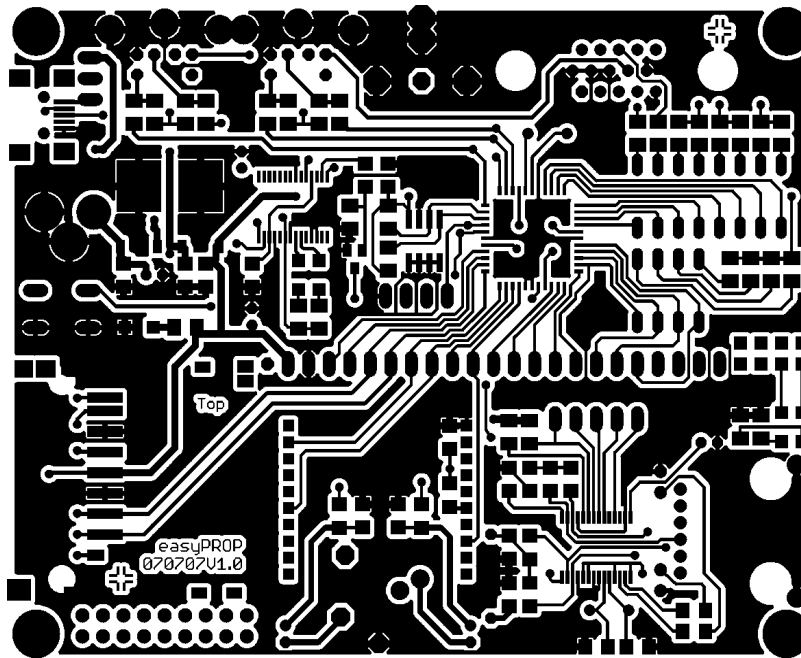
Please handle the easyPROP board and/
or the micro-chips with care.

Follow the instructions* for using
Electrostatic Sensitive Devices (ESD)

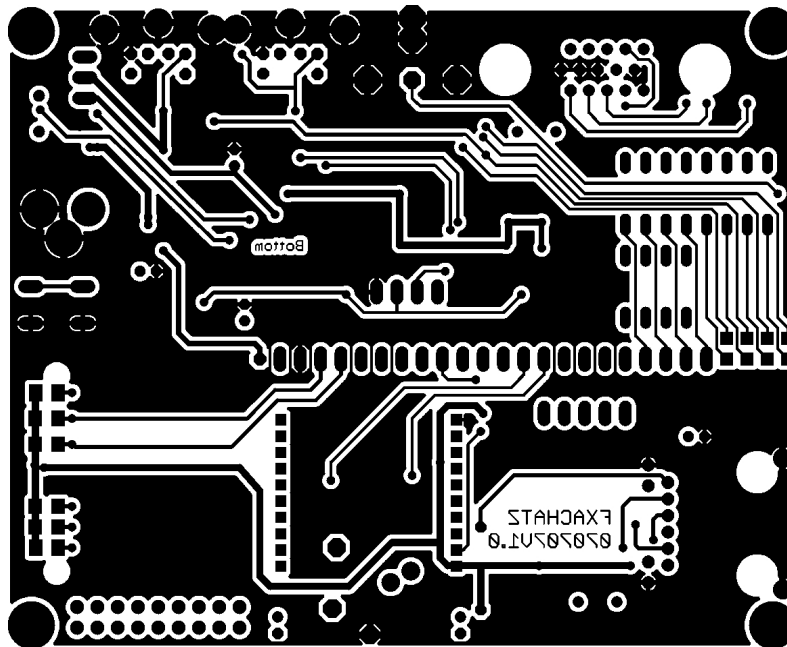


*more info about ESD: http://en.wikipedia.org/wiki/Electrostatic_discharge

Printed Circuit Board (top side)



Printed Circuit Board (bottom side)



Useful Hints

EasyPROP is shipped with an programmed NTSC Video Demo and the Power selector JP4 is jumpered to USB. If you like to power the easyPROP board by your own external Power supply please connect jumper JP4 to the position 1-2 . Take care that your Power supply matches the required voltage and current settings. Do **not** apply more than 9 V DC to the Propeller Board's DC Input connector.

The Ethernet Controller Signals (CS, SCK, SI, SO, INT) are not wired to any Port pin. Please locate your required Port pins and connect this signal by using jump-wires.

The “driver_enc28j60.spin” object assumes the following jump wire connection as described below:

<u>ENC28J60 Signals</u>		<u>Propeller Port Pins</u>	
CS	connected to		P11
SCK	connected to		P12
SI	connected to		P13
SO	connected to		P14
WOL	not connected		N.C.
INT	connected to		P15

The SD Memory connector is hardwired to P0, P1, P2 and P3 because the standard SD Memory Objects are already configured to this pins by default.

<u>SD Memory Slot</u>		<u>Propeller Port Pins</u>	
DO	connected to		P0
CLK	connected to		P1
DI	connected to		P2
CS	connected to		P3

The Xbee connector is hardwired:

<u>Xbee connector</u>		<u>Propeller Port Pins</u>	
CTS	connected to		P4
RTS	connected to		P5
DOUT	connected to		P6
DIN	connected to		P7

Video Port Pins:

<u>DIP Switch S3</u>		<u>Propeller Port Pins</u>	
S3-1	connected to	P12	
S3-2	connected to	P13	
S3-3	connected to	P14	
S3-4	connected to	P15	

VGA Port Pins:

<u>DIP Switch S1</u>		<u>Propeller Port Pins</u>	
S1-1	connected to	P16	
S1-2	connected to	P17	
S1-3	connected to	P18	
S1-4	connected to	P19	
S1-5	connected to	P20	
S1-6	connected to	P21	
S1-7	connected to	P22	
S1-8	connected to	P23	

Mouse Port Pins:

<u>Mouse Mini DIN</u>		<u>Propeller Port Pins</u>	
Pin 1	connected to	P24	
Pin 6	connected to	P25	

Keyboard Port Pins:

<u>Keyboard Mini DIN</u>		<u>Propeller Port Pins</u>	
Pin 1	connected to	P26	
Pin 6	connected to	P27	

User LEDs:

<u>User LEDs</u>		<u>Propeller Port Pins</u>	
LED 1	connected to	P22	
LED 2	connected to	P23	

Programming Plug:

<u>Programming Plug</u>		<u>Propeller Port Pins</u>	
Pin 1	connected to	VSS	
Pin 2	connected to	RESET	
Pin 3	connected to	P31	
Pin 4	connected to	P30	

Audio Signals:

<u>Audio Out Signals</u>		<u>Propeller Port Pins</u>	
Out A	connected to	P10	
Out B	connected to	P11	

Consult the schematic diagram for detailed information.

Quickstart

- 1. Install and start the Propeller tool software ***
- 2. Connect a Video screen to the TV/Video terminal**
- 3. Connect a PS2 Mouse to the easyPROP Mouse port**
- 4. Power up the easyPROP by using a USB cable via the PC USB port**
- 5. The Video easyPROP demo starts**
- 6. Open the tool-software and press “F7” to identify the Propeller hardware ****
- 7. Now you can compile and upload the Parallax demo programs**

* Setup the Propeller-Tool-V1.2.5 software via the included CDROM and start the installed propeller software under Start → Programs → Parallax Inc → Propeller Tool V1.2.5

** Note: FTDI USB driver is needed to operate correctly. Please download this driver from the Parallax website.