

LX9 Bitstream flush program and run manual

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(4 pages)

(*1) Hardware and software requirement

(1.1) Hardware

- * Xilinx Spartan-6 FPGA LX9 Microboard
- * Computer running X86 Linux having USB port

(ref Opf environment, Mac OS 10.9.5, Oracle Virtual Box 4.3.10 r93012, OpenSuSE i686, Xwindow on OpenSuSE)

(1.2) Software

- * Xilinx ISE

(ref Opf environment, ISE 13.1)

- * Digilent: Digilent Plugin for Xilinx Tools

- * Debugger, for example sh2-elf-gcc

(ref Opf environment, GNU gdb (GDB) 7.0)

(*2) Operation of programming

(2.1) download microboard9.bit

(2.2) start Linux

(2.3) (if Linux environment is just character environment)

start Xserver

(example `sudo /etc/init.d/xdm start`)

(2.4) Setup Xilinx tool environment setting

(example `source /opt/Xilinx/13.1/ISE_DS/settings32.csh`)

(2.5) execute impact

impact is included in Xilinx ISE

after impact, Dialog windows appear. select No -> No -> cancel

(ref Opf environment, impact 0.40d Release 13.1)

(2.6) connect LX 9 microboard full size USB connector to computer.

(2.7 – 2.9 are confirming microboard can be recognized from impact)

(2.7) Go to IMPACT window. (in IMPACT upper left box) double click on “Boudary

Scan”

(2.8) (After 2.7, in IMPACT upper right box, “Right click to Add Device or Initialize chain” is displayed).

Mouse Right click -> cable setup.

(2.9) (A new windows “Cable Communication Setup” is displayed)

Choose Bottom Checkbox on “Open Cable Plug-in, Select or enter Plug-in from the list ...”

Choose Cable Plug-in (one line below than check box) “digilent_plugin”

Then “ok.”

(2.10) (window “Cable Communication Setup” finishes)

(back to IMPACT windows)

(in IMPACT upper left box) double click on “Create PROM File “

(2.11) (A new window “PROM file formatter” is displayed)

(This window has Step 1, Step 2, Step 3; left to right)

In Step 1, choose “SPI Flash -> Configure Single FPGA”

Click on green right arrow.

In Step2, choose Storage Device (bits) 128M

Then Press button “Add Storage Device”

Click on green right arrow (between step 2 and step 3)

In Step 3, enter any name in “output File Name”

Choose a proper directory in “output File Location”

In File Format, choose “MCS”

In Add Non-configuration Data Files, Choose “No”.

Click OK button at the bottom.

A new window “Add Device: Start adding device file to Revision 0”. Is displayed.

Choose “OK”.

(2.12) A new dialog window “Add Device” appears.

Choose microboard9.bit (you downloaded). Then “OK”.

(2.13) Add Device new window

“Would you like to add another device to Revision: 0 ?”

Choose “No”.

(2.14) (Back to IMPACT windows)

In left upper second “IMPACT Processes”,

Double click “Generate File”

-> if successful “Generate Succeeded” is displayed on Impact window

check “.mcs” file is created as specifying in 2.10 Step 3.

(2.15) (in IMPACT upper left box) double click on “Boudary Scan”

(2.16) (After 2.15, in IMPACT upper right box, “Right click to Add Device or Initialize chain” is displayed).

Mouse Right click -> cable setup.

(2.17) (A new windows “Cable Communication Setup” is displayed)

Choose Bottom Checkbox on “Open Cable Plug-in, Select or enter Plug-in from the list ...”

Choose Cable Plug-in (one line below than check box) “digilent_plugin”

Then “ok.”

(2.18) (After 2.16, in IMPACT upper right box, “Right click to Add Device or Initialize chain” is displayed).

Mouse Right click -> Initilize Chain

(2.19) (A new window “Auto Assign Configuration Files Query Dialog” appears)

For “Do you want to continue and assign configuration file” question

Choose “No”.

A windows appears Choose Cancel.

(2.20) Click upper right box right click on IC-icon (xc6slx9),

Choose “Add SPI/BPI flash”

(2.21) A new window “add PROM File” to specify msc file appears.

Choose File created msc file in 2.13. Then “OK”.

(2.22) A new window “Select Attached SPI/BPI” spears.

Choose proper ones “SPI PROM”, “N25Q128 1.8/3.3V”, “4”

Then “OK”.

If a warning dialog appears, then Press “Yes”.

(2.23) Right click FLASH IC in upper right box; FLASH IC icon gets green.

Choose “Program”. Then OK. This procedure programs flush. (Previous contents on flush is lost)

(2.24) After flush is programmed, “Program succeeded” is displayed

(2.25) quit impact. You can detach microboard USB connector.

(*3) Operation of using ucLiunx

(3.1) download vmlinux

(3.2) connect both full size USB connector and mini USB connector

(3.3) Check USB device path of LX9 microboard appearing in Linux.

(ref in 0pf environment “/dev/ttyUSB0”)

(3.4) activate USB terminal emulator with 115,200 baud rate.

for example, “screen /dev/ttyUSB0 115200”

(3.5) Press reset SW (SW4) on microboard

(3.6) Quit USB terminal emulator

(3.7) Place download “vmlinux” (ex. Vmlinux_0pf) to current directory on PC, load ucLinux from debugger

example

```
sh2-elf-gdb
```

```
(gdb) set remotebaud 115200
```

```
(gdb) target remote /dev/ttyUSB0
```

```
(gdb) load vmlinux_0pf
```

```
... wait a while ...
```

(ref in 0pf environment, it takes 15 minutes to complete loading)

```
(gdb) continue
```

```
press control-C twice -> Give up (and stop debugging it)? (y or n) y
```

```
(gdb) quit
```

(3.8) activate USB terminal emulator, same command as (3.4).

caution: debugger and terminal emulator both can not share USB port same time.

(3.9) ucLinux boots and display messages on USB terminal emulator

(3.10) after one minute, Linux login is displayed

```
user=root, pw=admin
```

End of LX9 Bitstream flush program and run manual

Change history Rev(0) Jun/17/2015, Rev(1) Jun/18/2015