

Getting the 'Project Oberon' core running on FleaFPGA Ohm

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What is Project Oberon?

Project Oberon is an elegant desktop computer architecture created by Niklaus Wirth and Jürg Gutknecht. Oberon was created to demonstrate the feasibility of creating a simple yet useable self-hosted computer from scratch.

Further information on Project Oberon may be found here: <http://www.projectoberon.com/>

Originally, Project Oberon was designed to work with up to 1Mbyte of fast SRAM. Oberon as ported to FleaFPGA Ohm was carefully modified by Nicolae Dumitrache to interface with SDRAM instead of expensive SRAM. Also included in this port is Nicolae's VGA to HDMI interface module. Oberon's RISC5 CPU runs at a clock rate of 25MHz.

Before you begin:

You will need:

- 1.) 1 x FleaFPGA Ohm configured with Oberon SDRAM core (See SETUP PROCEDURE).
- 2.) 1 x correctly-prepared micro-SDHC card (see SETUP PROCEDURE below).
- 3.) 1 x PS/2 keyboard and (optional) PS/2 mouse, including all necessary adapter cabling.
- 4.) 1 x mini-HDMI to HDMI cable.
- 5.) 1 x micro USB cable to power your Ohm board.
- 6.) HDMI compatible TV that supports the 1024x768@70Hz mode required by Oberon.

Files as found in this GitHub page:

- 'Project_Oberon_Flash_Era_Prgm.vme' FPGA Configuration bit-file, allowing FleaFPGA Ohm to be configured as per the Minimig ECS example.
- 'Oberon_SDRAM_Diamond_Project.zip' Complete Oberon HDL project for use with Lattice Diamond (saved in Diamond version 3.9). Includes all HDL sources for the Oberon port to FleaFPGA Ohm. Has been saved as a Lattice Diamond Project archive and can be opened and modified under Lattice Diamond 3.9 and up.
- 'Oberon_setup_README.pdf' Document you are reading now ☺

Not included in this GitHub page but needed for the micro-SD card:

- Oberon operating system disk image <http://www.projectoberon.net/zip/RISCimg.zip>

***** OBERON SETUP PROCEDURE *****

Step 1.) Installing the ' Project_Oberon_Flash_Era_Prgm.vme' file into the FleaFPGA Ohm board:

Please download and select the above-mentioned bit-file and program your bit-file as outlined in the FleaFPGA Ohm Quickstart Guide. Once you have done this, connect your FleaFPGA Ohm board to a suitable display as per the previous page and power up the board. You should be greeted by a 1024x768@70Hz screen (assuming a display that supports it..) with random white pixels (i.e. garbage) on a black background.

If you see the above image, you were successful! ☺ Power off your Ohm board and proceed to the next step...

Step 2.) Copy the Oberon operating system image to the SDHC card.

(Note: Assuming Windows operating system)

Download and install Win32 Disk Imager. Use it to copy the Oberon disk image downloaded from the link provided in the previous page to your micro SDHC card.

Step 3.) Oberon initial power-up

Install the SDHC card into FleaFPGA Ohm, plug your PS/2 keyboard into 'USB2' port on FleaFPGA Ohm and apply power. Assuming the Oberon operating system image was successfully copied to your micro SDHC card, you should see the elegant Oberon desktop:



If you got this far: Congratulations! You have just completed your basic Oberon install! 😊

OK... So where to from here?

To know more about Project Oberon, users are again encouraged to visit the following website:
<http://www.projectoberon.com/>

Well that's it for now - Good luck and (as always) Happy Experimenting! 😊

Regards,
Valentin Angelovski

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