
CoreMP7

Quickstart Guide

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Introduction

This Quickstart Guide provides a brief outline of the procedures involved in designing and programming a CoreMP7 System.

[Chapter 1 – Tools Overview](#) lists the integrated tools available from Actel for designing and programming a CoreMP7 system.

[Chapter 2 – Design Flow](#) briefly explains design flow using Actel tools.

[Chapter 3 – FPGA Development](#) outlines the steps involved in developing a CoreMP7 system.

[Chapter 4 – Program Code Development](#) lays out the steps to create software for a CoreMP7 system.

Tools Overview

Actel offers the latest and best-in-class tools from leading vendors, such as Mentor Graphics®, SynaptiCAD®, Synplicity®, and ARM®. These tools, combined with custom-developed tools from Actel, are all integrated into a single CoreMP7 development package. The development package consists of three major components:

CoreConsole

- GUI-assisted creation of CoreMP7 systems
- Easy configuration of sub-blocks
- Automatic testbench generation

Actel Libero® Integrated Development Environment (IDE)

- Powerful project and design flow management
- Schematic and HDL design capability
- Automatic core generation (non-CoreMP7-related cores)
- RTL behavioral, post-synthesis, and post-layout simulation capability
- RTL synthesis
- Physical implementation, floorplanning, and place-and-route
- Timing and power analysis

ARM RealView® Development Kit (RVDK)

- Complete CoreMP7 software development kit
- Easy-to-use project management
- Compiler, linker, and assembler
- Code simulation using RealView Instruction Set Simulator (RVISS)
- Software or hardware debug using RealView Debugger

Design Flow

The CoreMP7 design flow consists of two paths, illustrated in [Figure 2-1 on page 10](#):

- FPGA development – The creation of the CoreMP7 system base on Actel M7 FPGAs
- Program code development – The creation of software programs that will execute within the CoreMP7 system

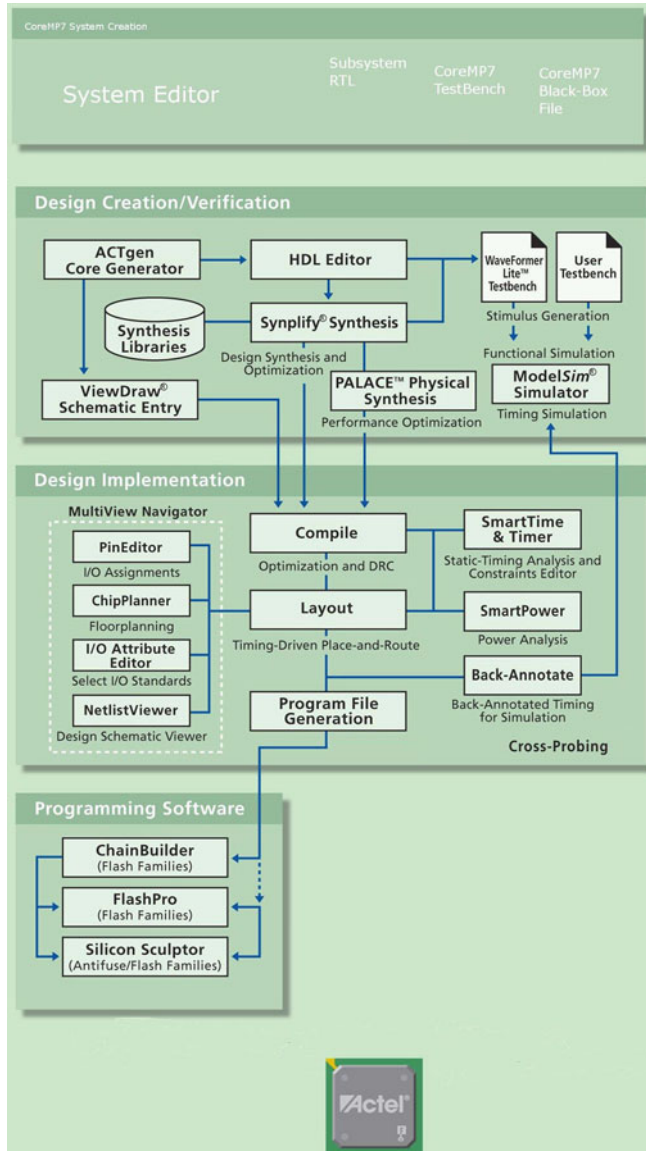


Figure 2-1. Design Flow

FPGA Development

The FPGA development is broken down into four stages:

1. Create the CoreMP7 system using CoreConsole.
2. Simulate and synthesize the CoreMP7 system.
3. Place-and-route the CoreMP7 system and generate a STAPL file.
4. Program the M7 device with the STAPL file.

Create CoreMP7 System

1. Create a new project in CoreConsole.

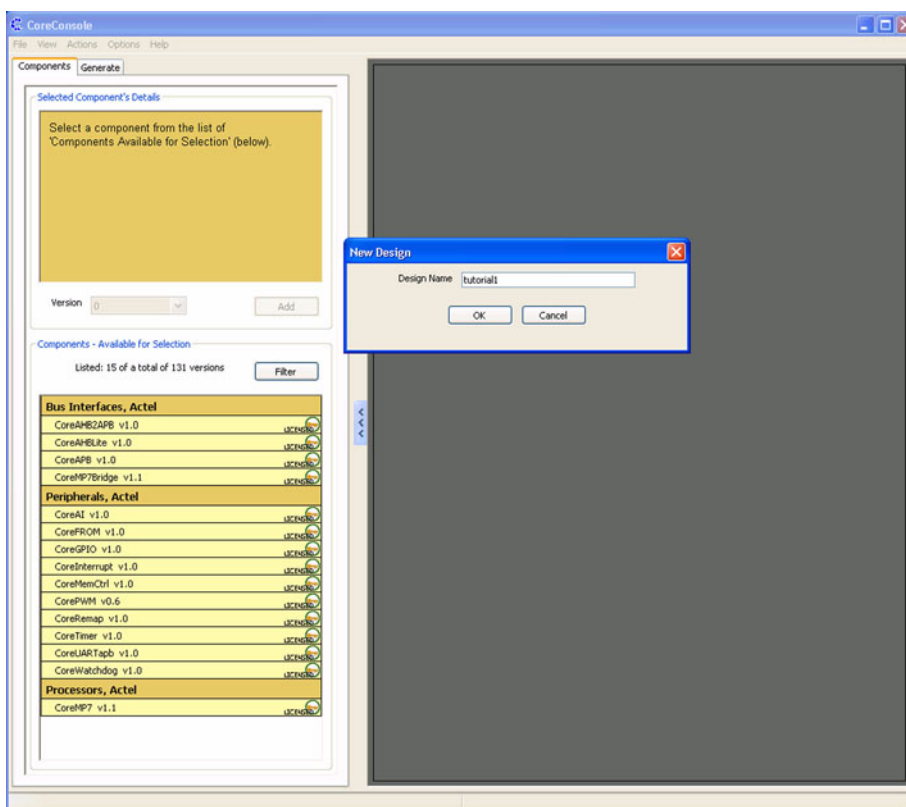


Figure 3-1. Creating a New Project

2. Add the required components.

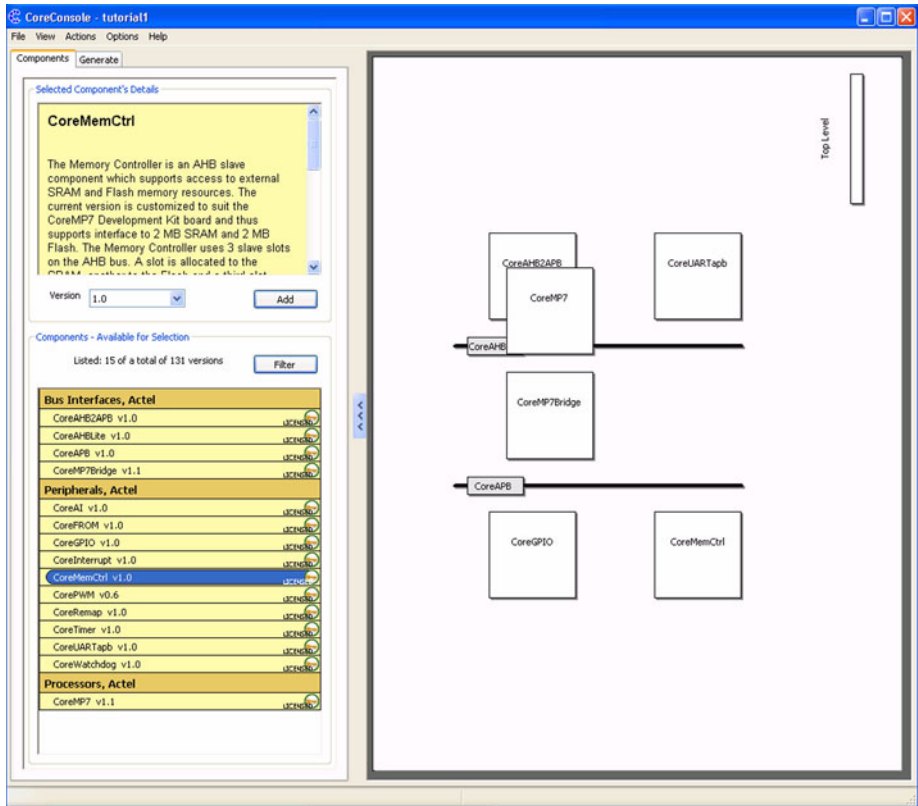


Figure 3-2. Adding Components

3. Connect the components. Use the **Auto Stitching** command to automatically connect the components together.

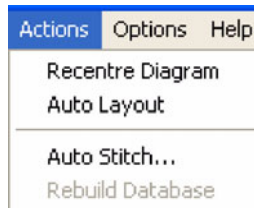


Figure 3-3. Auto Stitch Menu Selection

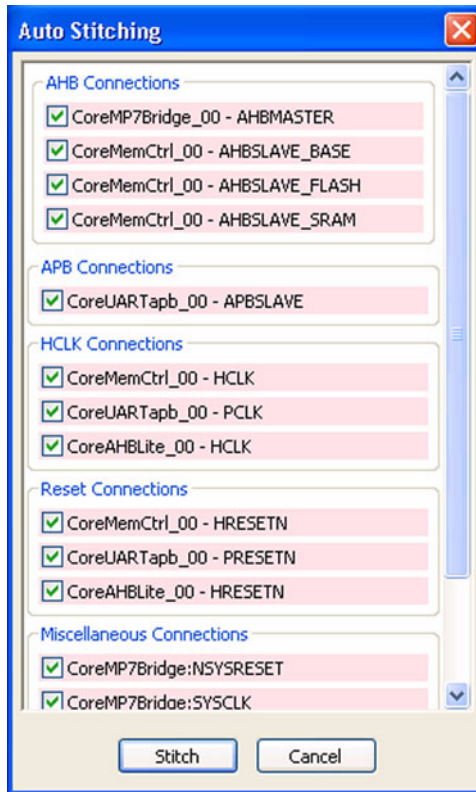


Figure 3-4. Auto Stitch

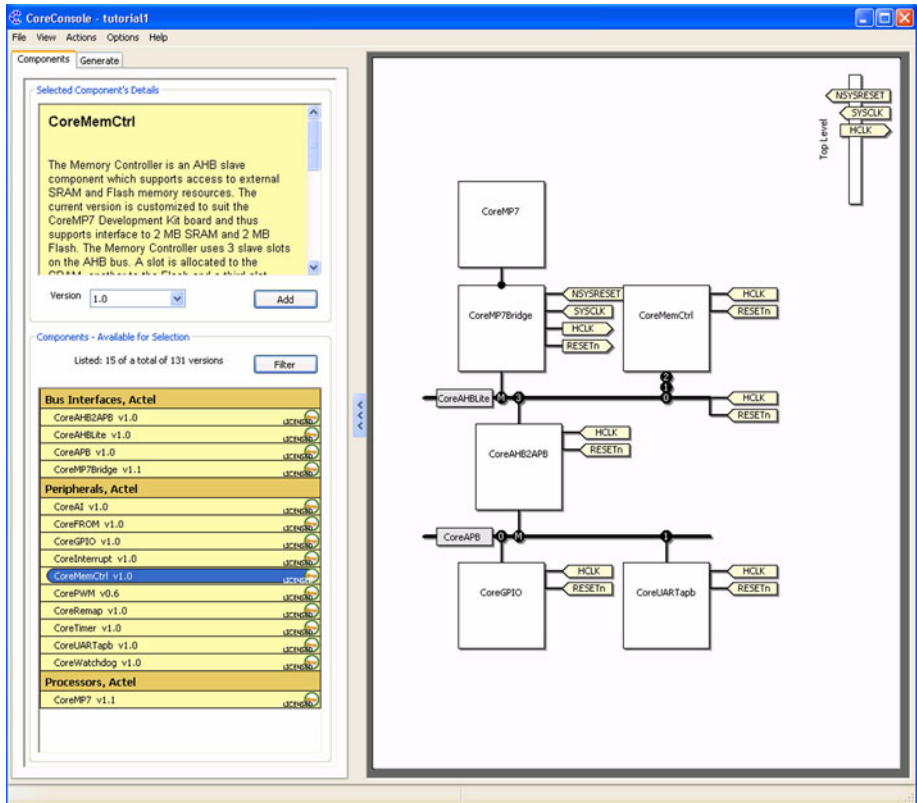


Figure 3-5. Final Design

4. Generate files for Libero IDE.

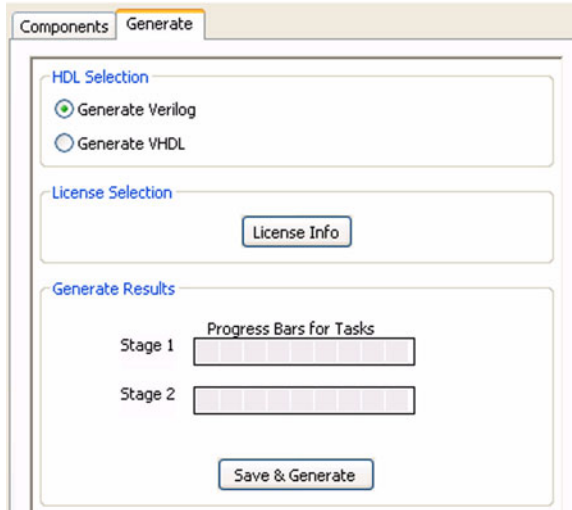


Figure 3-6. Generating Files for Libero IDE

Simulate and Synthesize System

1. Create a new M7 project in Libero IDE.

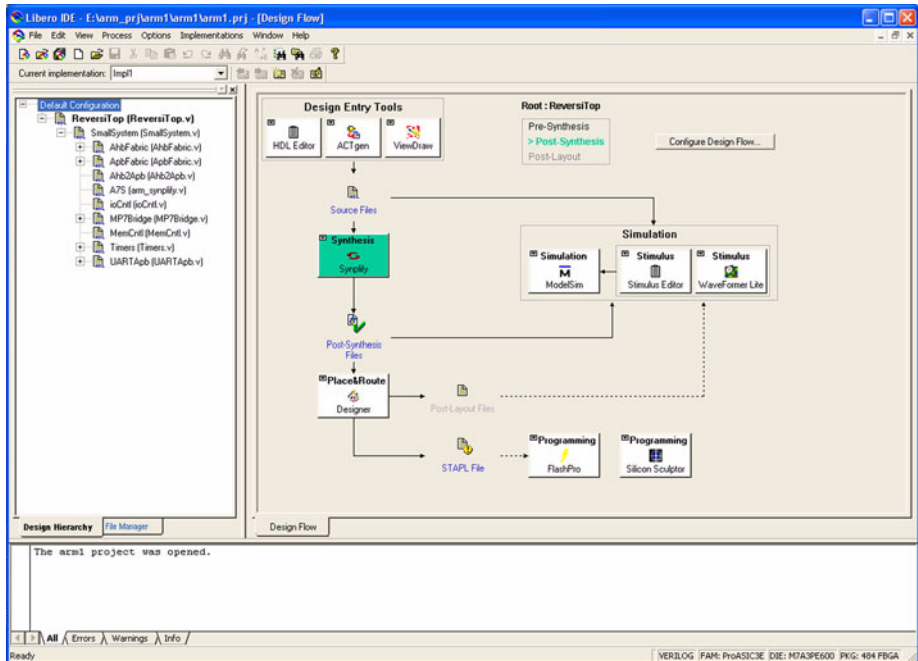


Figure 3-7. Libero IDE

2. Import the CoreConsole project file into the Libero IDE project.
3. Create a testbench.

4. Simulate the system at the pre-synthesis stage using ModelSim.[®]

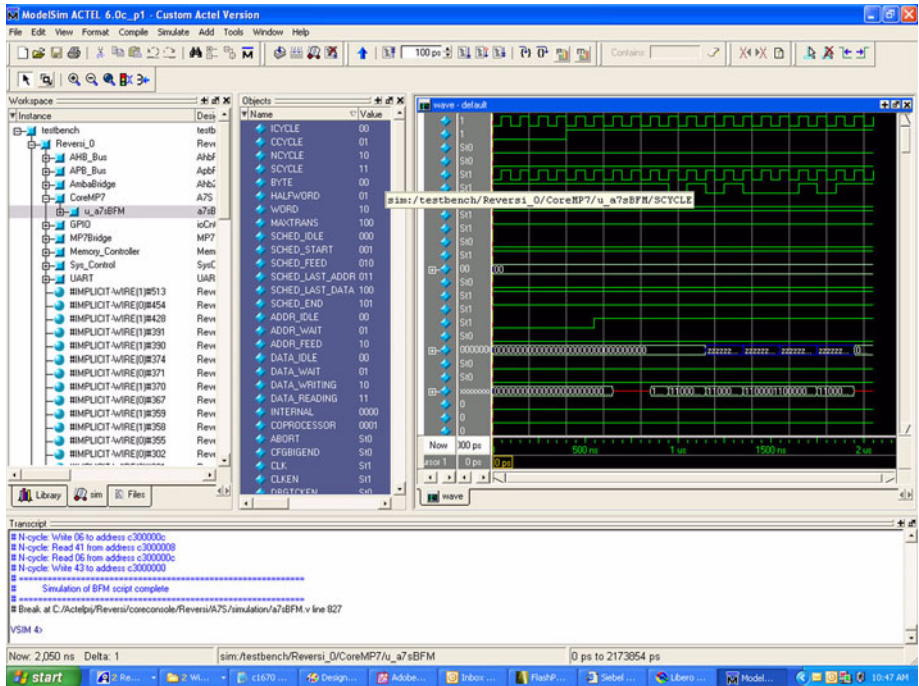


Figure 3-8. Simulation in ModelSim

5. Synthesize the RTL code using Synplify.[®]

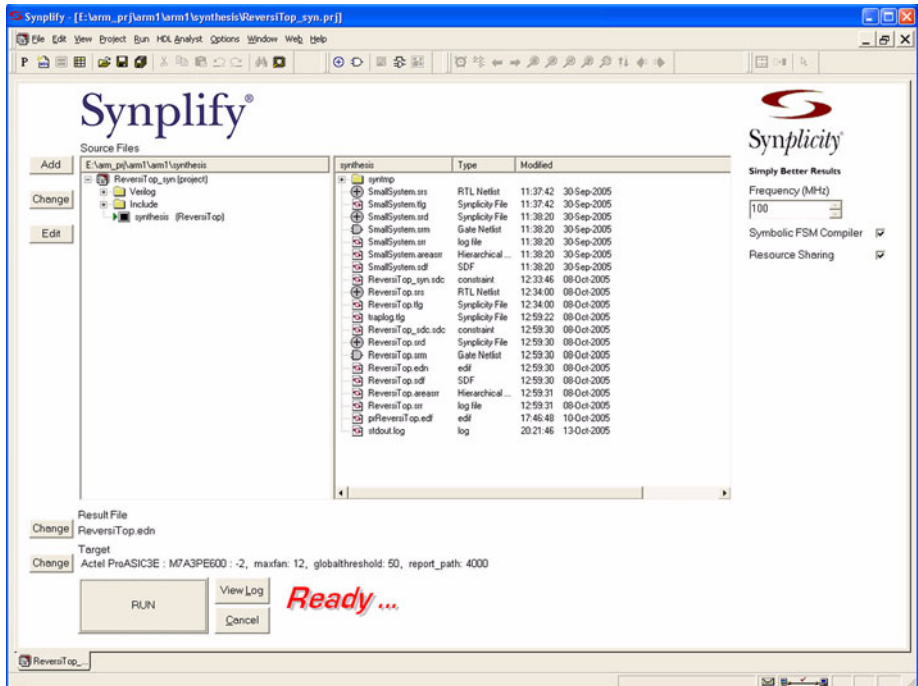


Figure 3-9. Synthesis in Synplify

Place-and-Route System and Generate STAPL File

1. Click the **Place-and-Route** icon in the Libero IDE design flow window to start Designer.

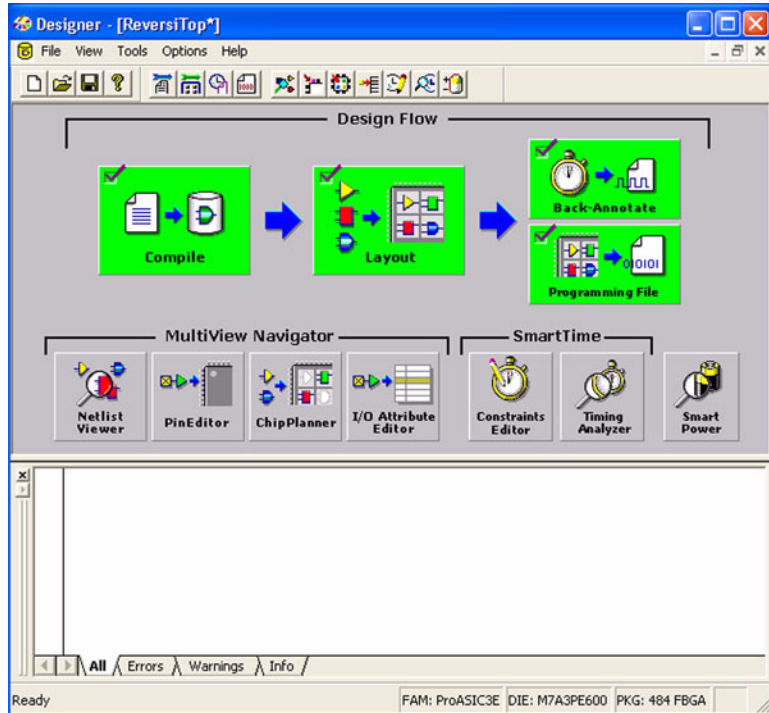


Figure 3-10. Designer Window

2. In Designer, click the **Compile** icon to compile the design. The icon will turn green once the compile is complete.
3. In Designer, click the **Layout** icon to lay out the design. The icon will turn green once layout is complete.
4. In Designer, click the **Programming File** icon to generate the programming file. The security feature will be disabled, as the programming file is automatically encrypted. The icon will turn green once the programming file is generated.
5. In Designer, click the **Back-Annotate** icon to generate a back-annotated netlist for simulation. The icon will turn green once the back-annotated netlist is generated.

Program M7 Device with STAPL File

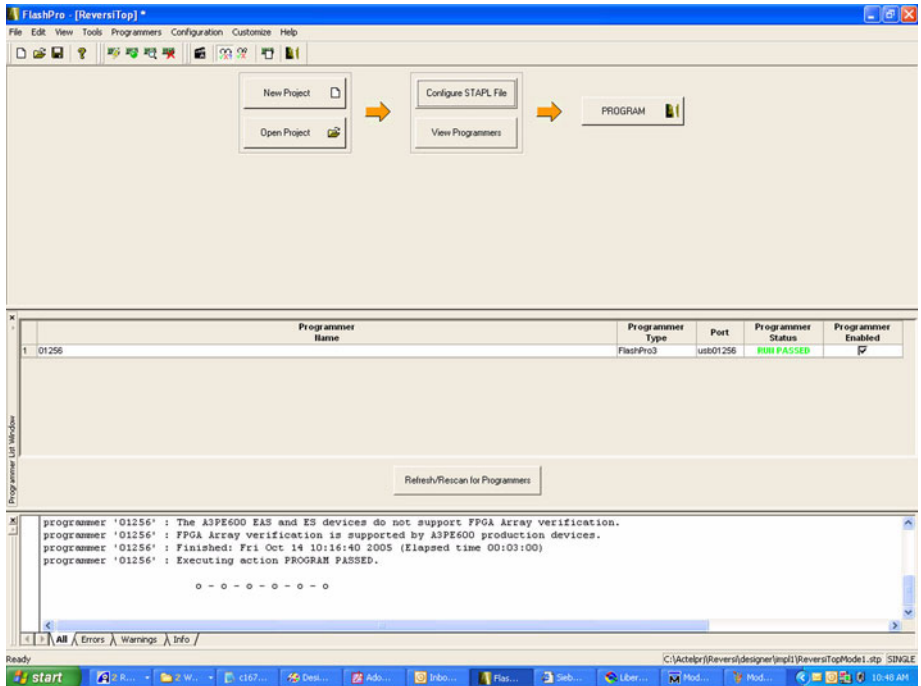


Figure 3-11. Programming with FlashPro

Program Code Development

The program code development is broken down into three stages:

1. Compile and build the source code using RVDK.
2. Simulate the source code using RVISS.
3. Download the resulting object file to the CoreMP7 system.

Compile and Build Source Code

1. Create a new project in RVDK.
2. Create new source code.
3. Compile and build the source code.

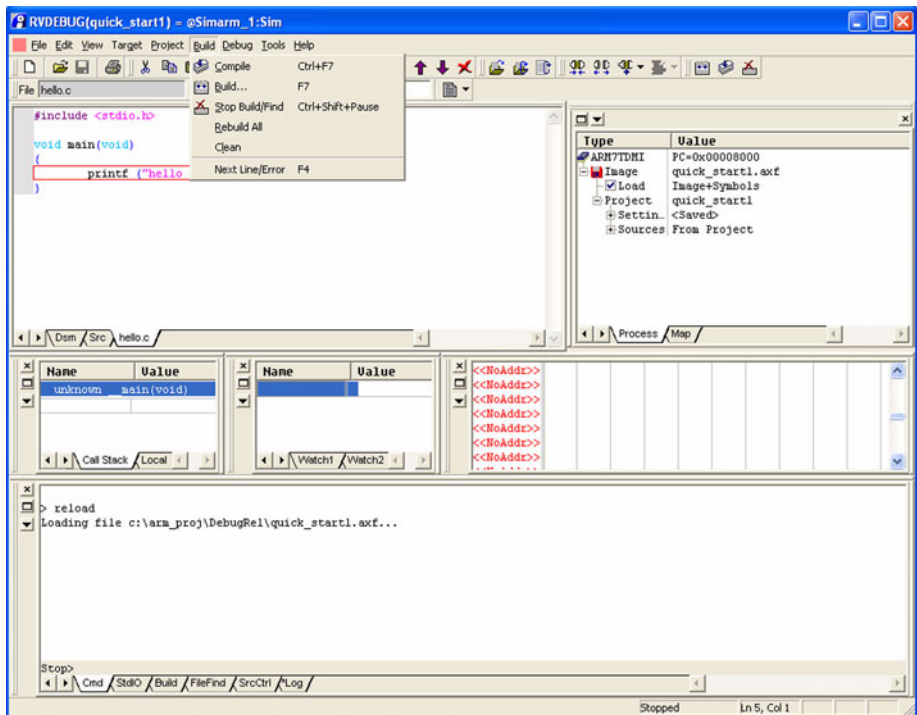


Figure 4-1. Compiling/Building in RVDK

Simulate Source Code

1. Connect to RVISS using the connection window.

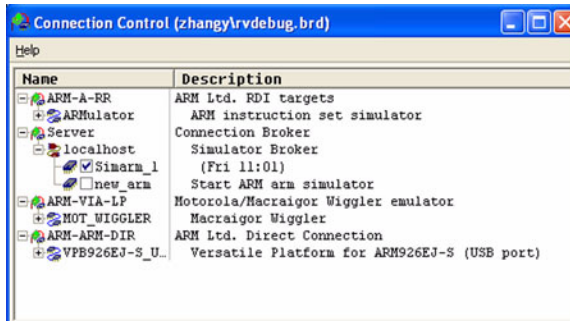


Figure 4-2. Connecting to RVISS

2. Upload the AXF file to the simulator.
3. Run the simulation.

Download Object File to CoreMP7 System

1. Select **Debug > Memory/Register Operations > Upload/Download Memory File** to download the final object file into the CoreMP7 system.

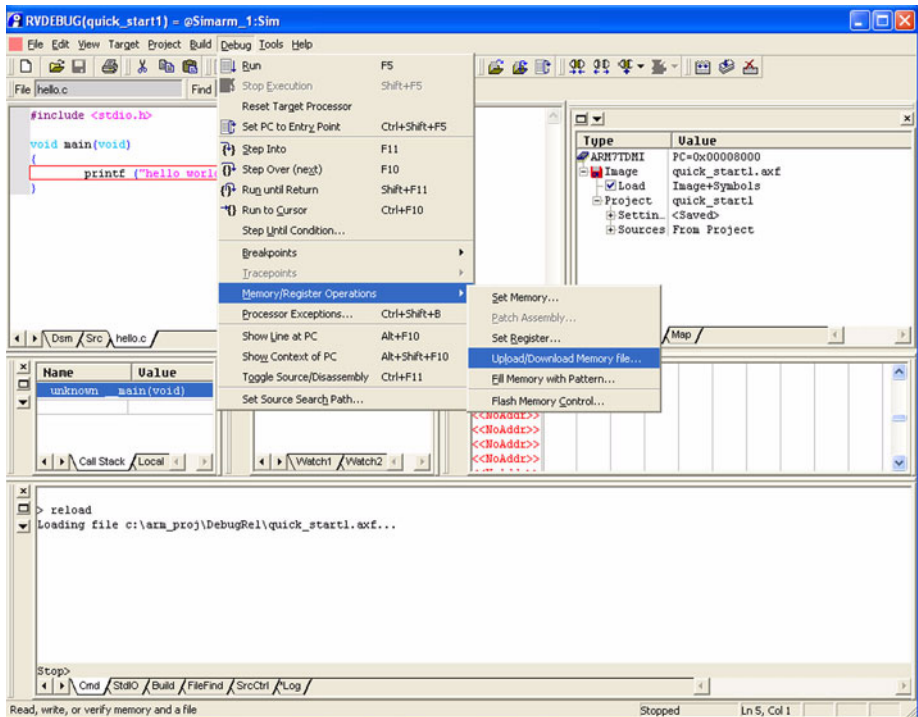


Figure 4-3. Uploading/Downloading in RVDK

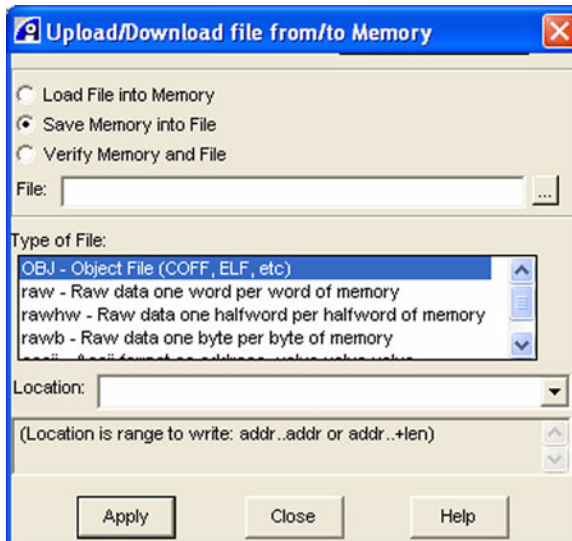


Figure 4-4. Downloading the Object File

For more information, refer to the following documents:

- [CoreConsole User's Guide](#)
- [Libero IDE User's Guide](#)
- [Designer User's Guide](#)
- [RealView Development Suite documentation](#)
- [FlashPro User's Guide](#)
- [CoreMP7 User's Guide](#)

Product Support

Actel backs its products with various support services including Customer Service, a Customer Technical Support Center, a web site, an FTP site, electronic mail, and worldwide sales offices. This appendix contains information about contacting Actel and using these support services.

Customer Service

Contact Customer Service for non-technical product support, such as product pricing, product upgrades, update information, order status, and authorization.

From Northeast and North Central U.S.A., call **650.318.4480**

From Southeast and Southwest U.S.A., call **650.318.4480**

From South Central U.S.A., call **650.318.4434**

From Northwest U.S.A., call **650.318.4434**

From Canada, call **650.318.4480**

From Europe, call **650.318.4252** or **+44 (0) 1276 401 500**

From Japan, call **650.318.4743**

From the rest of the world, call **650.318.4743**

Fax, from anywhere in the world **650.318.8044**

Actel Customer Technical Support Center

Actel staffs its Customer Technical Support Center with highly skilled engineers who can help answer your hardware, software, and design questions. The Customer Technical Support Center spends a great deal of time creating application notes and answers to FAQs. So, before you contact us, please visit our online resources. It is very likely we have already answered your questions.

Actel Technical Support

Visit the [Actel Customer Support website \(www.actel.com/custsup/search.html\)](http://www.actel.com/custsup/search.html) for more information and support. Many answers available on the searchable web resource include diagrams, illustrations, and links to other resources on the Actel web site.

Website

You can browse a variety of technical and non-technical information on Actel's [home page](http://www.actel.com), at www.actel.com.

Contacting the Customer Technical Support Center

Highly skilled engineers staff the Technical Support Center from 7:00 A.M. to 6:00 P.M., Pacific Time, Monday through Friday. Several ways of contacting the Center follow:

Email

You can communicate your technical questions to our email address and receive answers back by email, fax, or phone. Also, if you have design problems, you can email your design files to receive assistance. We constantly monitor the email account throughout the day. When sending your request to us, please be sure to include your full name, company name, and your contact information for efficient processing of your request.

The technical support email address is tech@actel.com.

Phone

Our Technical Support Center answers all calls. The center retrieves information, such as your name, company name, phone number and your question, and then issues a case number. The Center then forwards the information to a queue where the first available application engineer receives the data and returns your call. The phone hours are from 7:00 A.M. to 6:00 P.M., Pacific Time, Monday through Friday. The Technical Support numbers are:

650.318.4460

800.262.1060

Customers needing assistance outside the US time zones can either contact technical support via email (tech@actel.com) or contact a local sales office. [Sales office listings](#) can be found at www.actel.com/contact/offices/index.html.

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