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SIGNUM SYSTEMS

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Chameleon/JTAGjet for phyCORE-AT91M55800A

Getting  
Started

**SIGNUM**  
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CHAMELEON/JTAGJET FOR PHYCORE-AT91M55800A

# Getting Started

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HWM-GS-ChamJTAGjet-phyAT91 4.4.03.12.29



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**Purpose** *This document describes the Signum Systems JTAGjet emulator and Chameleon Debugger setup process for use with the phyCORE Development Board HD200 and phyCORE-AT91M55800A module from PHYTEC Messtechnik GmbH.*

## Introduction

This Getting Started manual assumes the following major components of the development/evaluation system:

- phyCORE-AT91M55800A module
- phyCORE Development Board HD200
- Signum JTAGjet emulator
- Signum Chameleon Debugger

The Atmel AT91M55800A microcontroller-based phyCORE-AT91M55800A is a subminiature ( $2.4 \times 2.1$  in) board that integrates all core elements of a microcontroller system in an easily expandable and embeddable module. Its multi-layer design, modern 0402-packaged SMD technology, laser-drilled Microvias and increased pin package—20% of which is dedicated to Ground to improve performance in high noise environments—place the phyCORE module at the cutting edge of miniaturization technology.

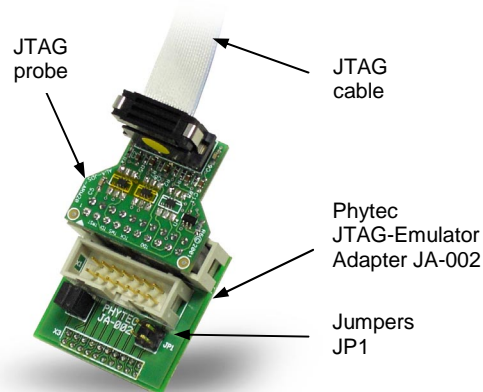
Design, development and validation of an embedded system based on the phyCORE-AT91M55800A module are greatly improved by the use of JTAGjet, the Signum System palm-size ( $2.5 \times 5.5 \times 1.0$  in) high-speed JTAG interface emulator for ARM systems. In conjunction with the Chameleon debugger, the JTAGjet offers ultra-fast application download, a rich array of instant code and data inspection tools, application optimization technology, superior user interface, remote debug option and powerful target control features.

## Hardware Installation

Please refer to Figure 1 when following the hardware installation instructions below. If your phyCORE development kit does not contain the new JTAG-Emulator\_Adapter JA-002, refer to Figure 4. Beware of static electricity. Handle the system elements only in a static-free environment.

1. **Connect the evaluation board to the emulator.** Before connecting the JTAG cable to the target, make sure that both the emulator and the target are turned OFF.
2. **Connect the JTAG emulation probe and cable to the JTAG connector on the target board.** The Phytex JTAG-Emulator Adapter JA-002 enforces the correct orientation of the JTAG cable.

**Important:** Make sure that both jumpers JP1 on the JA-002 adapter are removed.

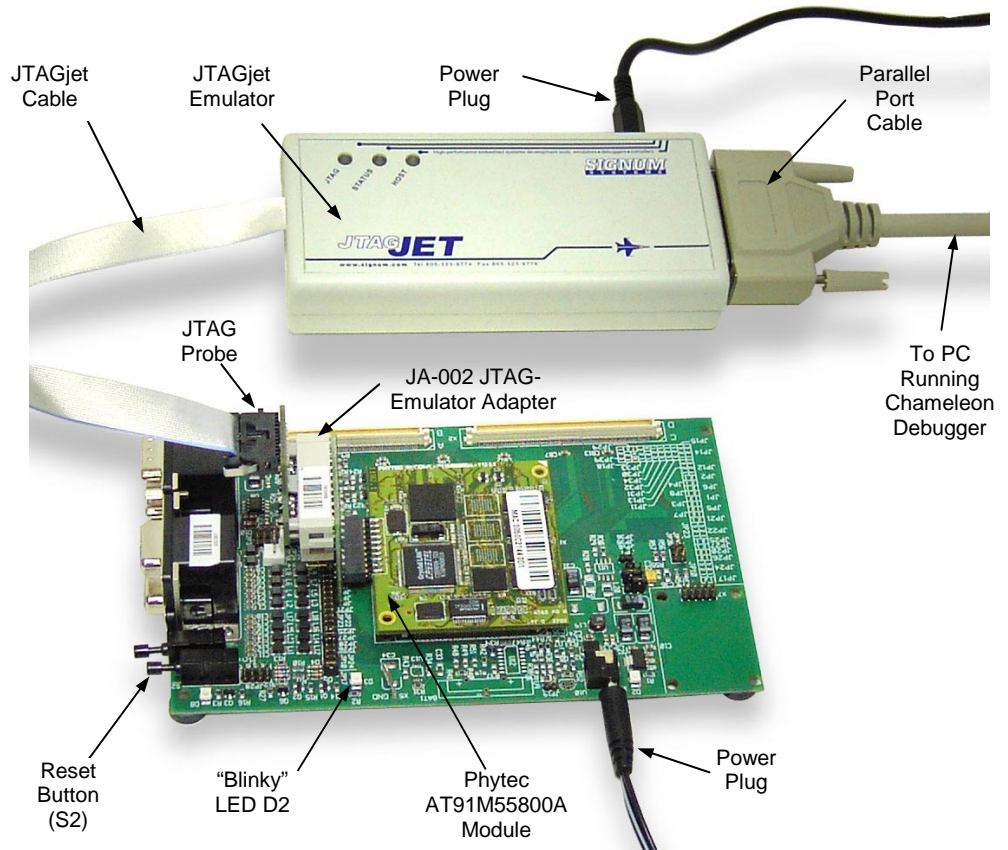


**FIGURE 2** Signum JTAG probe with the Phytex JTAG-Emulator Adapter JA-002 attached. Jumpers JP1 on the adapter should be removed for normal operation.

If you use the obsolete connection cable (see Figure 4), make sure that the Line 1 Marker of the JTAG connector ribbon cable is in the position shown in Figure 4. (Pin 1 of the JTAG connector X2 is marked with a black pad on the connector side of the PCB.)

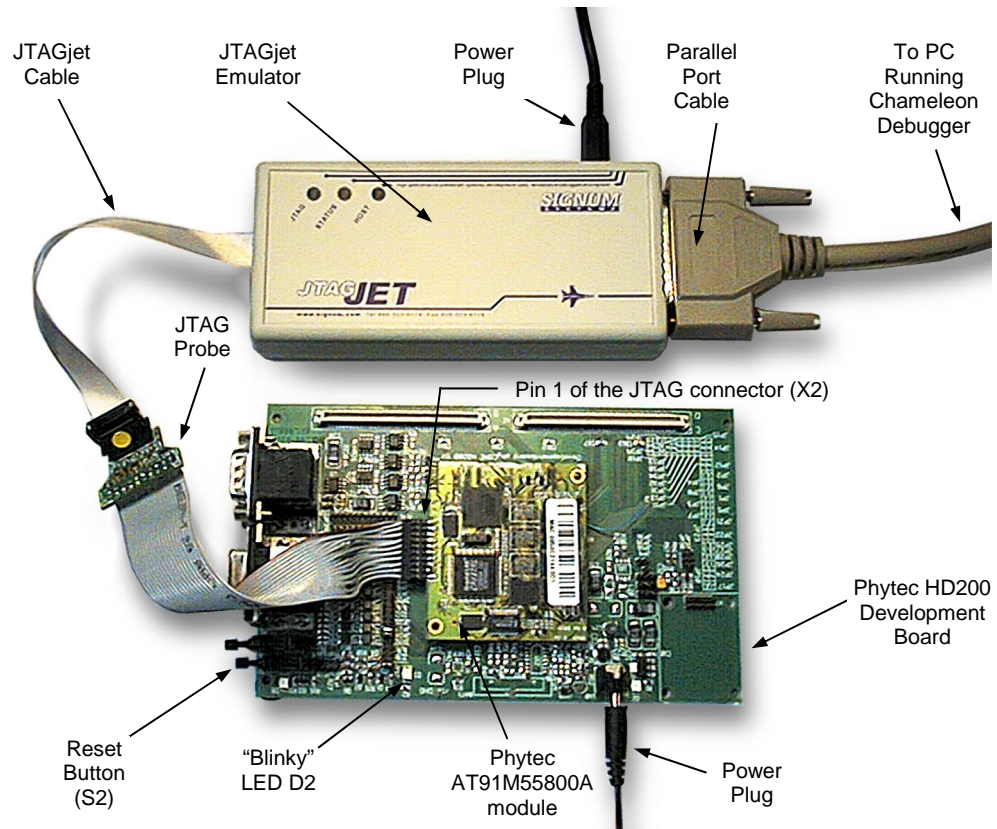
3. **Connect the PC to the emulator using a standard printer cable.** The parallel connector is a female DB-25 with the DCE interface.
4. **Attach the power supply to the emulator and turn the emulator on.** The JTAGjet has no power switch.
5. **Connect the evaluation board to its power supply.** It is important that the board be powered only after the emulator has been turned on.

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**FIGURE 3** JTAGjet emulator and the Phytex Development Board HD200 with the phyCORE-AT91M55800A module. Current configuration.

## CHAMELEON/JTAGJET FOR PHYCORE-AT91M55800A



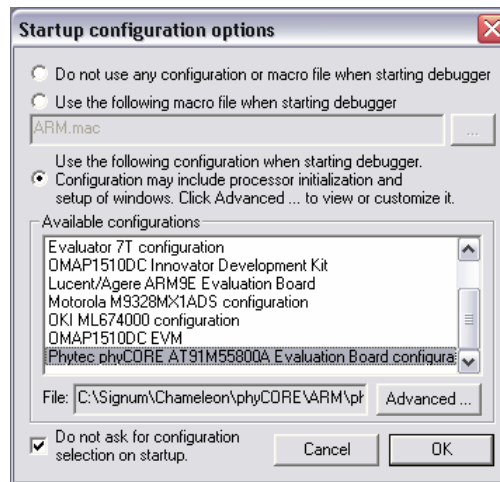
**FIGURE 4** Obsolete configuration.

## Software Installation

The software installation and configuration process is described in *Chameleon/JTAGjet for ARM Processor Installation Instructions* found in the product package. Please refer to these instructions before installing the debugger and its supporting software.

You should be mindful of two phyCORE-AT91M55800A specific aspects of the software installation process:

1. In the CPU selection step, choose ARM7TDMI as the CPU model.
2. In the system configuration step (the Startup Configuration Options dialog box), select Phytec phyCORE-AT91M55800A Evaluation Board Configuration as the startup configuration. See Figure 5.



**FIGURE 5** Selecting the startup configuration for the Phytec phyCORE module in Chameleon Debugger.

## Blinky Test Program

You can verify if your phyCORE system has been set up correctly by executing the Blinky test program. Blinky causes LED D3 on the phyCORE HD200 development board (“Blinky” LED in Figure 4) to flash at a constant rate. To verify the operability of your phyCORE system,

1. Install, configure and power up the system as described in the Introduction Hardware Installation and Software Installation sections.
2. Press the Reset button S2 on the target button.

**Important:** It is imperative that this step is performed. As of this writing, the CPU clock of the HD200 is not generated until the RESET button S2 is pushed.

3. Run the phycore.mac macro found in the Arm subfolder of the Chameleon installation folder (C:\Signum\Chameleon\Arm, by default). This macro performs memory mapping and other initialization tasks.

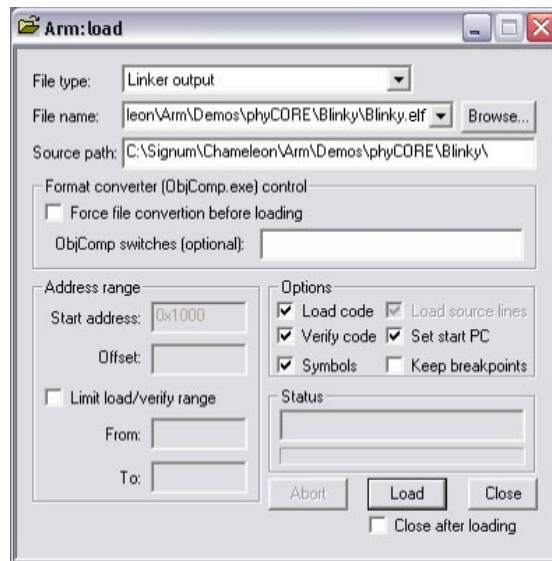
**Hint:** To run the phycore.mac macrocommand,

- Create a button for executing the macro. Press the Macro button located on the Macros toolbar and follow on-screen instruction. To display the Macros toolbar, from the View menu, select Toolbar Configuration and check the Macros check box.

– or –

- Select Command from the View menu and type `do phycore.mac` in the Command window that appears. For more information on macro execution, refer to *Chameleon User Manual*.

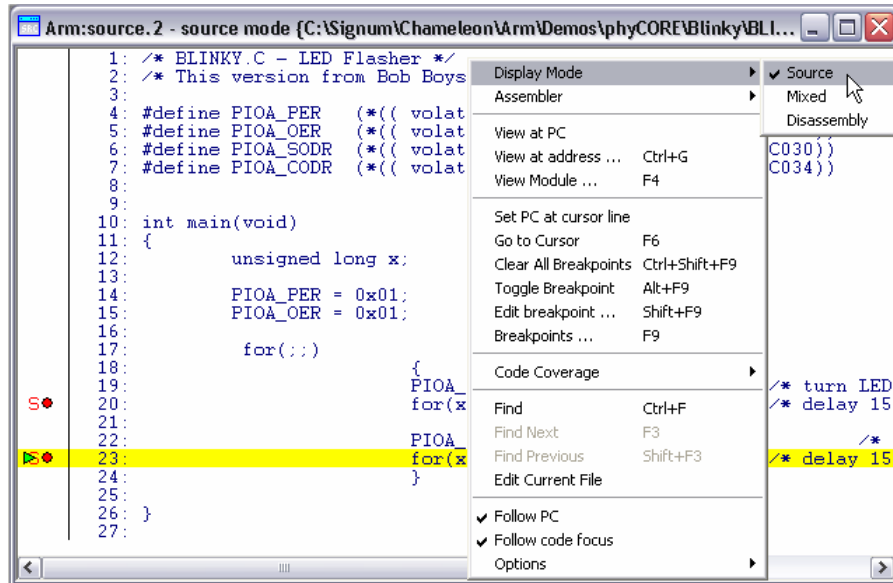
4. Select Load from the File menu to load the Blinky test program Blinky.elf into the target memory. The program is located in the Arm\Demos\phyCORE\Blinky subfolder of the Chameleon installation folder (C:\Signum\Chameleon\Arm\Demos\phyCORE\Blinky, by default). Make sure that the Verify Code option is selected. Press Load. Then close the dialog box.



**FIGURE 6** Loading the Blinky program.

5. Select Load from the File menu to load the Blinky test program into the target memory. The Load dialog box appears. Make sure that the Verify code option is selected. Press Load. Then close the dialog box.
6. On the CPU Control toolbar, press the Go button. As the program starts running, LED D3 on the target board begins blinking, which indicates that the major components of the system are functioning correctly.

You are ready to examine the system. One of the possible scenarios might be to stop the CPU by pressing the Stop button on the CPU Control toolbar and opening the Source window, selecting Source as the display mode from the right-click menu, setting breakpoints, stepping through the code performing other actions. See Figure 7.



**FIGURE 7** Selecting the display mode and examining the source in the Source window. Note the program counter and two software breakpoint indicators in the left margin of the window.

It is worth remembering that access to both the hardware and the software components of your development system is easily gained through the various windows found in the View menu and on the View Toolbar. *JTAGjet-ARM and JDSnet-ARM User Manual* and *Chameleon User Manual* provide detailed information about individual windows and their capabilities.

## Flash Programming

The Blinky test program used for demonstration purposes in the previous section runs in RAM, a volatile type of memory. Therefore, the program must be reloaded each time the board is restarted. The phyCORE-AT91M55800A is equipped with Flash, on-board non-volatile memory. Once loaded into the Flash memory, a program stays there indefinitely, or until erased or overwritten. It can be run and even debugged there. Flash programming of the module does not require a dedicated Flash programming voltage; the storage devices are programmable at 3.3 V.

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Signum Chameleon debugger is furnished with a plug-in enabling you to program Flash directly from within the debugger. Please refer to the *Flash Programming Plugin for Chameleon Debugger* user guide for details. □