DG0634
Demo Guide
Running CoreTSE_AHB IP based Webserver on SmartFusion2 using lwIP and FreeRTOS - Libero SoC v11.7 SP2
# Contents

1 Revision History ................................................................. 1  
1.1 Revision 3.0 ......................................................................... 1  
1.2 Revision 2.0 ......................................................................... 1  
1.3 Revision 1.0 ......................................................................... 1  

2 Running CoreTSE_AHB IP based Webserver on SmartFusion2 Devices .......... 2  
2.1 Webserver Demo Design Layers ............................................. 2  
2.1.1 Application Layer ......................................................... 3  
2.1.2 Transport Layer (lwIP TCP/IP Stack) .............................. 3  
2.1.3 RTOS and Firmware Layer ............................................ 3  
2.2 Design Requirements ............................................................ 4  
2.3 Demo Design ...................................................................... 4  
2.3.1 CoreTSE_AHB IP MAC Initialization ............................... 5  
2.3.2 SERDES_IF Configuration ........................................... 5  
2.3.3 Ethernet Packet Reception ........................................... 5  
2.3.4 Ethernet Packet Transmission ...................................... 5  
2.4 Demo Design Features .......................................................... 5  
2.5 Demo Design Description ..................................................... 5  
2.5.1 Libero SoC Hardware Project ...................................... 6  
2.6 Setting Up the Demo Design ................................................ 9  
2.6.1 Board Setup ............................................................... 10  
2.7 Running the Demo Design ..................................................... 10  
2.7.1 Running Webserver Demo ............................................ 11  

3 Appendix: Board Setup for Running the Demo ...................................... 18  
4 Appendix: Jumper Locations ....................................................... 19  
5 Appendix: Running the Design in Static IP Mode .................................. 20  
6 Appendix: Running the SoftConsole Project in Debug Mode .................... 23
Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>Webserver Application on a SmartFusion2 FPGA</td>
<td>3</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Demo Design Files Top-Level Structure</td>
<td>4</td>
</tr>
<tr>
<td>Figure 3</td>
<td>Block Diagram of CoreTSE_AHB Webserver Demo</td>
<td>5</td>
</tr>
<tr>
<td>Figure 4</td>
<td>Libero SoC Top-Level Hardware Design</td>
<td>6</td>
</tr>
<tr>
<td>Figure 5</td>
<td>High-Speed Serial Interface Configurator Window</td>
<td>7</td>
</tr>
<tr>
<td>Figure 6</td>
<td>SoftConsole Project Explorer Window</td>
<td>8</td>
</tr>
<tr>
<td>Figure 7</td>
<td>Demo Design Driver Versions</td>
<td>9</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Device Manager Window</td>
<td>9</td>
</tr>
<tr>
<td>Figure 9</td>
<td>FlashPro New Project Window</td>
<td>11</td>
</tr>
<tr>
<td>Figure 10</td>
<td>FlashPro Project Configuration Window</td>
<td>12</td>
</tr>
<tr>
<td>Figure 11</td>
<td>FlashPro Program Passed</td>
<td>13</td>
</tr>
<tr>
<td>Figure 12</td>
<td>HyperTerminal with Welcome Message</td>
<td>13</td>
</tr>
<tr>
<td>Figure 13</td>
<td>HyperTerminal with IP Address</td>
<td>14</td>
</tr>
<tr>
<td>Figure 14</td>
<td>Main Menu of Webserver</td>
<td>14</td>
</tr>
<tr>
<td>Figure 15</td>
<td>Webserver RTC and Ethernet Interface Data Display</td>
<td>15</td>
</tr>
<tr>
<td>Figure 16</td>
<td>Selecting Blinking LEDs</td>
<td>15</td>
</tr>
<tr>
<td>Figure 17</td>
<td>Blinking LEDs</td>
<td>16</td>
</tr>
<tr>
<td>Figure 18</td>
<td>Selecting HyperTerminal Display</td>
<td>16</td>
</tr>
<tr>
<td>Figure 19</td>
<td>Webserver HyperTerminal Display</td>
<td>16</td>
</tr>
<tr>
<td>Figure 20</td>
<td>String Display on HyperTerminal</td>
<td>17</td>
</tr>
<tr>
<td>Figure 21</td>
<td>Selecting SmartFusion2 Google Search</td>
<td>17</td>
</tr>
<tr>
<td>Figure 22</td>
<td>Webserver SmartFusion2 Google Search</td>
<td>17</td>
</tr>
<tr>
<td>Figure 23</td>
<td>SmartFusion2 Security Evaluation Board Setup</td>
<td>18</td>
</tr>
<tr>
<td>Figure 24</td>
<td>SmartFusion2 Security Evaluation Kit Silkscreen Top View</td>
<td>19</td>
</tr>
<tr>
<td>Figure 25</td>
<td>Project Explorer Window of SoftConsole Project</td>
<td>20</td>
</tr>
<tr>
<td>Figure 26</td>
<td>CoreTSE_M2S90_ Webserver Properties Window</td>
<td>21</td>
</tr>
<tr>
<td>Figure 27</td>
<td>Host PC TCP/IP Settings</td>
<td>21</td>
</tr>
<tr>
<td>Figure 28</td>
<td>Static IP Address Settings</td>
<td>22</td>
</tr>
<tr>
<td>Figure 29</td>
<td>Debug Configurations</td>
<td>23</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Table 1</td>
<td>Design Requirements</td>
<td>4</td>
</tr>
<tr>
<td>Table 2</td>
<td>LED to Package Pin Assignment</td>
<td>7</td>
</tr>
<tr>
<td>Table 3</td>
<td>PHY Interface Signals to Package Pins Assignments</td>
<td>8</td>
</tr>
<tr>
<td>Table 4</td>
<td>SmartFusion2 FPGA Security Evaluation Kit Jumper Settings</td>
<td>10</td>
</tr>
</tbody>
</table>
1 Revision History

The revision history describes the changes that were implemented in the document. The changes are listed by revision, starting with the most current publication.

1.1 Revision 3.0

The following is a summary of the changes in revision 3.0 of this document.

• Libero SoC, FlashPro, and SoftConsole design requirements were updated. For more information, see Design Requirements, page 4.
• Throughout the document, the names of SoftConsole projects used in the demo design (and the associated figures) were updated.

1.2 Revision 2.0

Updated the document for Libero v11.7 software release (SAR 77067).

1.3 Revision 1.0

Revision 1.0 was the first publication of this document.
2 Running CoreTSE_AHB IP based Webserver on SmartFusion2 Devices

This demo design associated with this document shows the CoreTSE_AHB IP based implementation of the Webserver application on the SmartFusion2 Security Evaluation Kit. SmartFusion2 devices have built-in microcontroller subsystem (MSS) media access controller (MAC) for Ethernet solutions. This demo guide describes how to use the CoreTSE_AHB intellectual property (IP) core and not MSS Ethernet MAC for running the Webserver application. The soft IP CoreTSE_AHB is useful when a solution demands more than one Ethernet interface. Microsemi Core Triple-Speed (CoreTSE) Ethernet IP is a configurable soft IP core that complies with the IEEE 802.3 standard.

The CoreTSE IP core enables system designers to implement a broad range of Ethernet designs, from low cost 10/100 Ethernet to higher performance 1 gigabit ports. The CoreTSE IP core is suited for use in networking equipment such as switches, routers, and data acquisition systems.

The CoreTSE IP has the following major interfaces:
- 10/100/1000 Mbps Ethernet MAC with a gigabit media independent interface (GMII) and ten bit interface (TBI) to support serial gigabit media independent interface (SGMII), 1000BASE-T, and 1000BASE-X.
- GMII or TBI physical layer interface connects to Ethernet PHY
- MAC data path interface

The CoreTSE IP Ethernet MAC can be configured as GMII or TBI for Ethernet network at 10/100/1000 Mbps data transfer rates (line speeds).

The CoreTSE IP core is available in two different versions:
- CoreTSE_AHB: Uses AHB interface for both the transmit and receive paths. This IP works for SmartFusion2 system-on-chip (SoC) field programmable gate array (FPGA).
- CoreTSE (Non-AMBA): Uses direct access to the MAC with a streaming packet interface. This IP works for IGLOO®2 FPGA.

For more information about CoreTSE_AHB IP, see the CoreTSE_AHB Handbook.

Note: CoreTSE_AHB IP core requires license for using in Libero® SoC design. For license request, contact soc_marketing@microsemi.com.

This demo demonstrates the following
- Use of CoreTSE_AHB IP-based Ethernet MAC connection to a serial gigabit media independent interface (SGMII) PHY.
- Integration of CoreTSE_AHB driver with the lwIP TCP/IP stack and the FreeRTOS operating system.
- Implementation of Webserver on the SmartFusion2 Security Evaluation Kit board.
- Procedure to run the Webserver design on the SmartFusion2 Security Evaluation Kit board.

2.1 Webserver Demo Design Layers
The Webserver and TFTP server demo designs have the following layers.
- Application layer
- Transport layer (lwIP TCP/IP stack)
- RTOS and firmware layer
The following figure is a block diagram of three layers in Webserver application on the SmartFusion2 device.

**Figure 1 • Webserver Application on a SmartFusion2 FPGA**

<table>
<thead>
<tr>
<th>Application Layer (HTTP)</th>
<th>FreeRTOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport Layer (lwIP TCP/IP Stack)</td>
<td></td>
</tr>
<tr>
<td>Firmware Layer</td>
<td></td>
</tr>
<tr>
<td>SmartFusion2 Security Evaluation Kit (HW)</td>
<td></td>
</tr>
</tbody>
</table>

### 2.1.1 Application Layer

The Webserver handles the HTTP request from the client browser and transfers the static pages to the client in response to their request. These pages run on the client (host PC) browser. When the URL with IP address (for example, http://10.60.3.25) is typed in the browser, the HTTP request is sent to the port on the Webserver. The Webserver interprets the request and responds to the client with the requested page or resource.

### 2.1.2 Transport Layer (lwIP TCP/IP Stack)

The lwIP TCP/IP stack, developed by Adam Dunkels at the Swedish Institute of Computer Science (SICS), is suitable for the embedded systems because of its low system resource usage. The lwIP stack can be used with or without the operating system. It consists of the actual implementations of IP, ICMP, UDP, and TCP protocols, as well as the support functions such as buffer and memory management.

The lwIP is available (under a BSD license) in C source-code format for download at [http://download.savannah.gnu.org/releases/lwip/](http://download.savannah.gnu.org/releases/lwip/).

### 2.1.3 RTOS and Firmware Layer

FreeRTOS is an open-source, real-time operating system kernel. In this demo FreeRTOS is used to prioritize and schedule tasks. For more information and the latest source code, see [http://www.freertos.org](http://www.freertos.org).

The firmware provides the software driver implementation to configure and control the following MSS components:

- Multi-mode universal asynchronous receiver/transmitter (MMUART)
- General purpose input and output (GPIO)
- Real-time clock (RTC)
### 2.2 Design Requirements

The following table lists the hardware, software, firmware, and IP requirements for this demo design.

#### Table 1 • Design Requirements

<table>
<thead>
<tr>
<th>Design Requirements</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hardware</strong></td>
<td></td>
</tr>
<tr>
<td>SmartFusion2 Security</td>
<td>Rev D or later</td>
</tr>
<tr>
<td>Evaluation Kit:</td>
<td></td>
</tr>
<tr>
<td>- 12 V adapter</td>
<td></td>
</tr>
<tr>
<td>- FlashPro4</td>
<td></td>
</tr>
<tr>
<td>- USB A to Mini-B cable</td>
<td></td>
</tr>
<tr>
<td>RJ45 cable</td>
<td></td>
</tr>
<tr>
<td>Host PC or Laptop</td>
<td>Windows 64-bit Operating System</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td></td>
</tr>
<tr>
<td>Libero System-on-Chip (SoC)</td>
<td>v11.7 SP2</td>
</tr>
<tr>
<td>FlashPro Programming Software</td>
<td>v11.7 SP2</td>
</tr>
<tr>
<td>SoftConsole</td>
<td>v4.0</td>
</tr>
<tr>
<td>Host PC Drivers</td>
<td>USB to UART drivers</td>
</tr>
<tr>
<td>Browser</td>
<td>Mozilla Firefox or Internet Explorer</td>
</tr>
<tr>
<td>CoreTSE Driver</td>
<td>v2.3.100</td>
</tr>
<tr>
<td><strong>IP</strong></td>
<td></td>
</tr>
<tr>
<td>CoreTSE_AHB IP</td>
<td>v2.1.105 (license provided on request)</td>
</tr>
</tbody>
</table>

### 2.3 Demo Design

The demo design files are available for download at:
http://soc.microsemi.com/download/rsc/?f=m2s_dg0634_liberov11p7sp2_df

The demo design files include:

- A Libero SoC hardware project with the corresponding SoftConsole firmware project
- Sample files
- Programming files
- A README.txt file

The following figure shows the top-level structure of the demo design files. For more information, see the README.txt file.

#### Figure 2 • Demo Design Files Top-Level Structure

```
<download_folder>
   m2s_dg0634_liberov11p7sp2_df
      Libero Project
      Programming File
      README.txt
```
Running CoreTSE_AHB IP based Webserver on SmartFusion2 Devices

The following figure shows the demo design block diagram.

**Figure 3 • Block Diagram of CoreTSE_AHB Webserver Demo**

In the Webserver demo design, CoreTSE_AHB IP is instantiated in the FPGA fabric and connected to the on-board Ethernet Marvell PHY using the high-speed serial interface (SERDES_IF).

The following sections explain the initialization and configuration of CoreTSE_AHB, SERDES_IF and the Ethernet packet transmission and reception.

### 2.3.1 CoreTSE_AHB IP MAC Initialization

The CoreTSE_AHB IP MAC is configured in the TBI mode. The ARM Cortex-M3 (micro controller subsystem) is used to initialize the CoreTSE_AHB IP MAC in 1000 Base-T and the on-board Ethernet PHY.

### 2.3.2 SERDES_IF Configuration

The high-speed SERDES_IF is configured in the external physical coding sub layer (EPCS) mode lane 3 and is connected between the CoreTSE_AHB IP MAC and the on-board Ethernet PHY.

### 2.3.3 Ethernet Packet Reception

The CoreTSE_AHB IP MAC receives the Ethernet packet from the on-board Ethernet PHY through high-speed SERDES_IF using the built-in DMA controller.

### 2.3.4 Ethernet Packet Transmission

CoreTSE_AHB MAC transmits the Ethernet packet from the built-in DMA controller to the on-board Ethernet PHY through high-speed SERDES_IF.

The Security Evaluation Kit acts as a Webserver and the host PC acts as a web client that accesses the Webserver features through the RJ45 interface.

### 2.4 Demo Design Features

- Webserver: Displays options for the following:
  - RTC and Ethernet interface data display
  - Blinking LEDs
  - HyperTerminal display
  - SmartFusion2 Google search

### 2.5 Demo Design Description

The demo design is implemented using an SGMII PHY interface by configuring the CoreTSE_AHB IP MAC for the ten-bit interface (TBI) operation.
2.5.1 Libero SoC Hardware Project

The following figure shows the Libero SoC hardware design implementation for the demo design.

*Figure 4 • Libero SoC Top-Level Hardware Design*
The Libero SoC hardware project uses the following SmartFusion2 MSS resources and IPs:

- **MMUART_1** for RS-232 communications on the Security Evaluation Kit
- **GPIO**: Interfaces the light emitting diodes (LEDs)
- **CoreTSE_AHB IP core**
- **SERDES_IF** and **SERDES_IF_2** configured for **SERDESIF_0 EPCS Lane 3**, as shown in the following figure.

For more information on **SERDES_IF**, see the *UG0447: SmartFusion2 and IGLOO2 High Speed Serial Interfaces User Guide*.

**Figure 5 • High-Speed Serial Interface Configurator Window**

### 2.5.1.1 Package Pin Assignment

Each LED and PHY interface signal on the SmartFusion2 board has a package pin assigned to it. The following table lists the LED port names and corresponding package pins.

**Table 2 • LED to Package Pin Assignment**

<table>
<thead>
<tr>
<th>Port Name</th>
<th>Package Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED_1</td>
<td>E1</td>
</tr>
<tr>
<td>LED_2</td>
<td>F4</td>
</tr>
<tr>
<td>LED_3</td>
<td>F3</td>
</tr>
<tr>
<td>LED_4</td>
<td>G7</td>
</tr>
<tr>
<td>LED_5</td>
<td>H7</td>
</tr>
<tr>
<td>LED_6</td>
<td>J6</td>
</tr>
<tr>
<td>LED_7</td>
<td>H6</td>
</tr>
<tr>
<td>LED_8</td>
<td>H5</td>
</tr>
</tbody>
</table>
The following table lists the PHY interface signals, signal direction, and corresponding package pins.

<table>
<thead>
<tr>
<th>Port Name</th>
<th>Direction</th>
<th>Package Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY_MDC</td>
<td>Output</td>
<td>J3</td>
</tr>
<tr>
<td>PHY_MDIO</td>
<td>Input</td>
<td>J4</td>
</tr>
<tr>
<td>PHY_RST</td>
<td>Output</td>
<td>K6</td>
</tr>
</tbody>
</table>

2.5.1.2 SoftConsole Firmware Project

Open the CoreTSE_AHB Webserver SoftConsole project using the standalone SoftConsole IDE.

The following stacks are used for this demo design:

- lwIP TCP/IP stack version 1.4.1
- FreeRTOS ([www.freertos.org](http://www.freertos.org))

The following figure shows the SoftConsole software directory structure of the demo design.

Figure 6 • SoftConsole Project Explorer Window

The SoftConsole workspace has CoreTSE_M2S90_Webserver, which contains implementation of the Webserver application using lwIP and FreeRTOS.

**Note**: To run the SoftConsole project in debug mode, see Appendix: Running the SoftConsole Project in Debug Mode, page 23.
2.6 Setting Up the Demo Design

The following steps describe how to setup the demo for the SmartFusion2 Security Evaluation Kit board:

1. Connect the host PC to the J18 connector using the USB A to Mini-B cable. The USB to UART bridge drivers are automatically detected.
2. From the detected four COM ports, right-click any one of the COM ports and select Properties. The selected COM port properties window is displayed.
3. Ensure to have the Location as on USB Serial Converter D in the Properties window, as shown in the following figure.

   **Note:** Make a note of the COM port number for serial port configuration and ensure that the COM port location is specified as on USB Serial Converter D.

4. Install the USB driver, if it is not detected automatically.
5. Install the FTDI D2XX driver for serial terminal communication through the FTDI Mini USB cable.
Download the drivers and installation guide from:

6. Connect the jumpers on the SmartFusion2 Security Evaluation Kit board, as shown in the following table. For information on jumper locations, see Appendix: Jumper Locations, page 19.

CAUTION: Switch OFF the power supply switch, SW7, before making the jumper connections.

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Pin From</th>
<th>Pin To</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>J22, J23, J24, J8, J3</td>
<td>1</td>
<td>2</td>
<td>These are the default jumper settings of the SmartFusion2 Security Evaluation Kit board. Ensure that jumpers are set accordingly.</td>
</tr>
</tbody>
</table>

7. Connect the power supply to the J6 connector in the SmartFusion2 Security Evaluation Kit.

8. This design example can run in both static IP and dynamic IP modes. By default, the programming files are provided for dynamic IP mode.
   • For static IP, connect the host PC to the J13 connector on the SmartFusion2 Security Evaluation Kit board using an RJ45 cable.
   • For dynamic IP, connect any one of the open network ports to the J13 connector of the SmartFusion2 Security Evaluation Kit board using an RJ45 cable.

2.6.1 Board Setup

Snapshots of the SmartFusion2 Security Evaluation Kit board with the setup is given in Appendix: Board Setup for Running the Demo, page 18.

2.7 Running the Demo Design

The following steps describe how to run the demo design.

1. Download the demo design from:
   http://soc.microsemi.com/download/rsc/?f=m2s_dg0634_liberov11p7sp2_df

2. Switch ON the SW7 power supply switch.

3. Start any of the serial terminal emulation programs such as:
   • HyperTerminal
   • PuTTY
   • TeraTerm

Note: In this demo, HyperTerminal is used.

   The configuration for the program is:
   • Baud Rate: 115200
   • Eight data bits
   • One stop bit
   • No parity
   • No flow control

For information on configuring the serial terminal emulation programs, see the Configuring Serial Terminal Emulation Programs Tutorial.
2.7.1 Running Webserver Demo

The following steps describe how to run the Webserver demo:

1. Launch the FlashPro software.
2. Click New Project.
3. In the New Project window, enter the project name.

*Figure 9 • FlashPro New Project Window*

4. Click Browse and navigate to the location where the project is required to be saved.
5. Select Single device as the Programming mode.
6. Click OK to save the project.
7. Click Configure Device, as shown in Figure 10, page 12.
8. Click **Browse**, navigate to the location where the file is located and select the file. The default location is: `<download_folder>\ProgrammingFiles\webserver`. The required programming file is selected and is ready to be programmed in the device.

*Figure 10 • FlashPro Project Configuration Window*
9. Click **PROGRAM** to start programming the device. Wait until a message is displayed indicating that the program has passed.

**Figure 11 • FlashPro Program Passed**

![FlashPro Program Passed](image)

**Note:** The demo can be run in static and dynamic modes. To run the design in static IP mode, follow the steps mentioned in the Appendix: Running the Design in Static IP Mode, page 20.

    A welcome message is displayed in the HyperTerminal window, as shown in the following figure.

**Figure 12 • HyperTerminal with Welcome Message**

![HyperTerminal with Welcome Message](image)
11. Press S on the keyboard till the IP address is displayed, as shown in following figure.

Figure 13 • HyperTerminal with IP Address

12. Enter the IP address displayed on the HyperTerminal in the address bar of the browser (Mozilla Firefox) to run the Webserver. The main menu of the Webserver is shown in Figure 14, page 14.

13. Click RTC and Ethernet Interface data display.

Figure 14 • Main Menu of Webserver
The following web page appears, displaying RTC values and Ethernet MAC properties.

*Figure 15 • Webserver RTC and Ethernet Interface Data Display*

14. Click **Home** to go back to the main menu.
15. Click **Blinking LEDs** on the main menu.

*Figure 16 • Selecting Blinking LEDs*

The LEDs on the board start blinking, and a web page appears, with an option to enter a values to toggle LEDs manually.
16. Enter any number between 1 to 255 to toggle the LEDs manually and click Submit. For example, if 1 is entered, LED1 goes OFF. If 255 is entered, all the eight LEDs go OFF. 
   **Note:** The SmartFusion2 Security Evaluation Kit has Active Low LEDs.

*Figure 17 • Blinking LEDs*

![Blinking LEDs](image)

17. Click Home to go back to the main menu.
18. Click HyperTerminal Display on the main menu.

*Figure 18 • Selecting HyperTerminal Display*

![Selecting HyperTerminal Display](image)

A web page appears with an option to enter a string value to be displayed in HyperTerminal.

*Figure 19 • Webserver HyperTerminal Display*

![Webserver HyperTerminal Display](image)
The entered string is displayed on HyperTerminal, as shown in the following figure.

**Figure 20 • String Display on HyperTerminal**

19. Click **Home** to go back to the main menu.
20. Click **SmartFusion2 Google Search**.

**Figure 21 • Selecting SmartFusion2 Google Search**

Note: An Internet connection is required to access the SmartFusion2 Google search page.

A web page appears, with the **SmartFusion2 Google search** option.

**Figure 22 • Webserver SmartFusion2 Google Search**

21. Click **Home** to go back to the main menu.
The following figure shows the board setup for running the demo on the SmartFusion2 Security Evaluation Kit board.

Figure 23 • SmartFusion2 Security Evaluation Board Setup
Appendix: Jumper Locations

The following figure shows the jumper locations in the SmartFusion2 Security Evaluation Kit board.

Figure 24 • SmartFusion2 Security Evaluation Kit Silkscreen Top View

Note: Jumpers highlighted in red are set by default.

Note: The location of the jumpers in the preceding figure are searchable.
5 Appendix: Running the Design in Static IP Mode

The following steps describe how to run the design in static IP mode:

1. To run the webserver design in static IP mode, right-click the CoreTSE_M2S90_Webserver project and select Properties, as shown in the following figure.

Figure 25 • Project Explorer Window of SoftConsole Project
2. Remove the symbol **NET_USE_DHCP** in **Tool Settings** of the **Properties** for **CoreTSE_M2S90_Webserver** window, as shown in the following figure.

*Figure 26 • CoreTSE_M2S90_Webserver Properties Window*

3. If the device is connected in static IP mode and the board static IP address is 169.254.1.23, change the host TCP/IP settings to reflect the IP address. The following figure shows the host PC TCP/IP settings.

*Figure 27 • Host PC TCP/IP Settings*
The following figure shows the static IP address settings.

**Figure 28 • Static IP Address Settings**

![Static IP Address Settings](image)

4. After configuring the settings, compile the design, load it into memory, and run it using SoftConsole.
Appendix: Running the SoftConsole Project in Debug Mode

The following steps describe how to run the SoftConsole project in Debug mode:

1. Select **Debug Configurations** from the **Run** menu of the SoftConsole. The **Debug Configurations** dialog box is displayed, as shown in the following figure.

   **Figure 29 • Debug Configurations**

2. Select the target and click **Debug**.

   **Note:** To run the application in debug mode, FlashPro4 JTAG programmer is required.