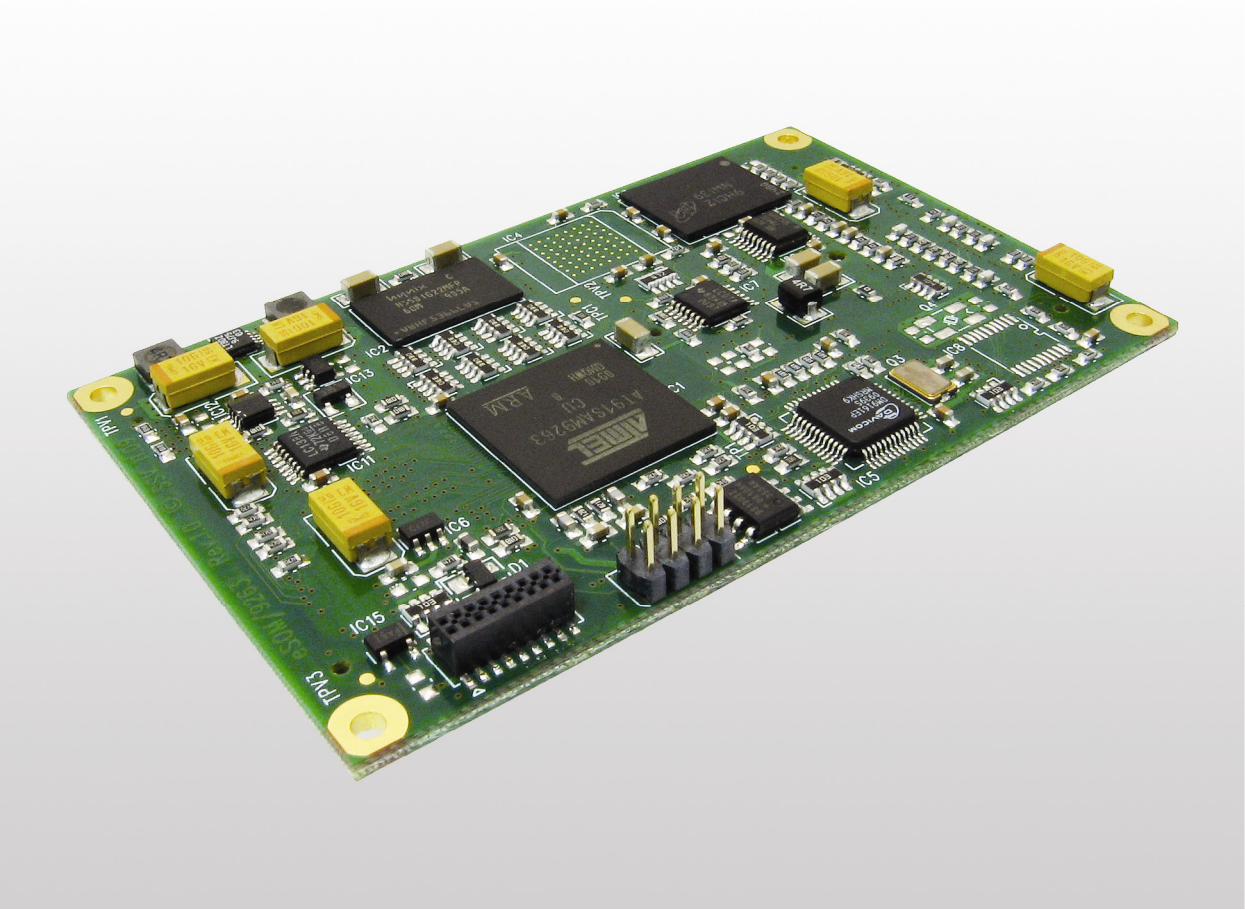
# *eSOM/9263*

## *Creating a C-Program*

# microHowTo



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# 1 INTRODUCTION

This document describes how to create, run and debug a simple C program with the Eclipse IDE (Integrated Development Environment) and how to run it. So the Eclipse IDE should be already installed on the development system.

## 1.1 Conventions

| Convention | Usage |
|---|---|
| **bold** | Important terms, menu items, buttons |
| `monospace` | Pathnames, program code, command lines |

**Table 1: Conventions used in this Document**

# 2 CREATING A C PROGRAM

1. Start Eclipse and confirm the working directory question. Eclipse includes one demo project in C. You can use this demo or delete it and create a new one.

2. Create a new project clicking on **File > New > C Project**.

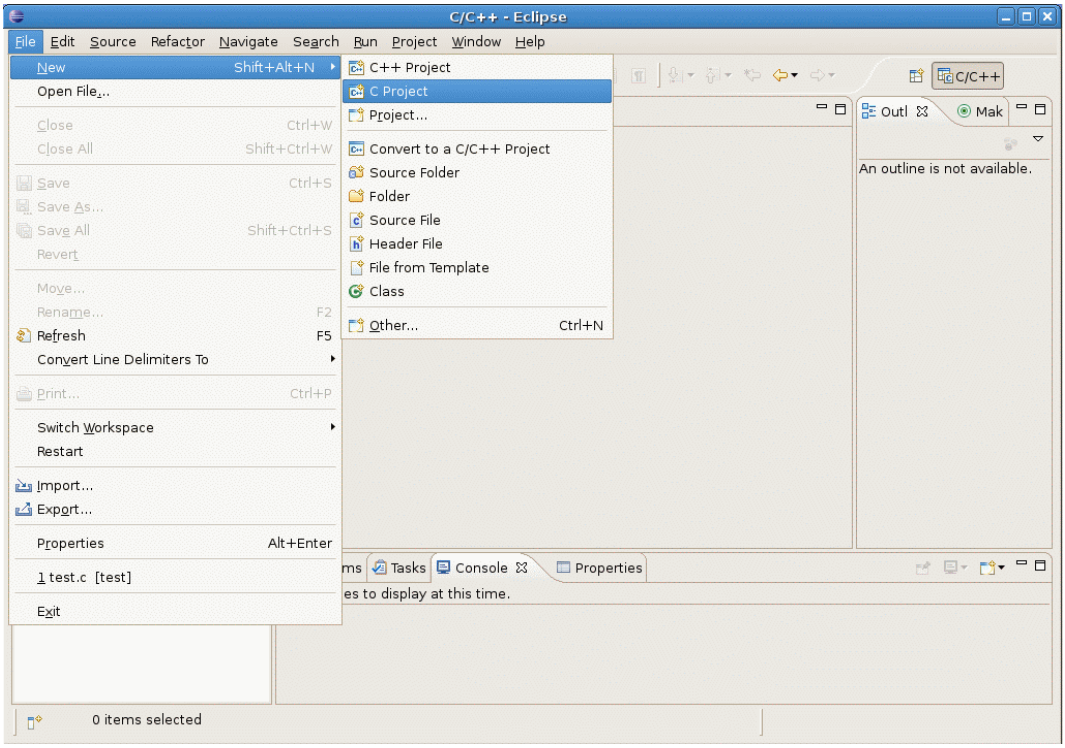


**Figure 1: Creating a new project**

3. A dialog box opens. Name the project **"hello_world"**, choose the **ARM-angstrom** tool chain and click on **Finish**.

4. Select the created project in the **Project Explorer** on the left side and add a new source file clicking **File > New > Source File**.

5. A dialog box opens. Name the source file **"hello_world.c"** and click on **Finish.**

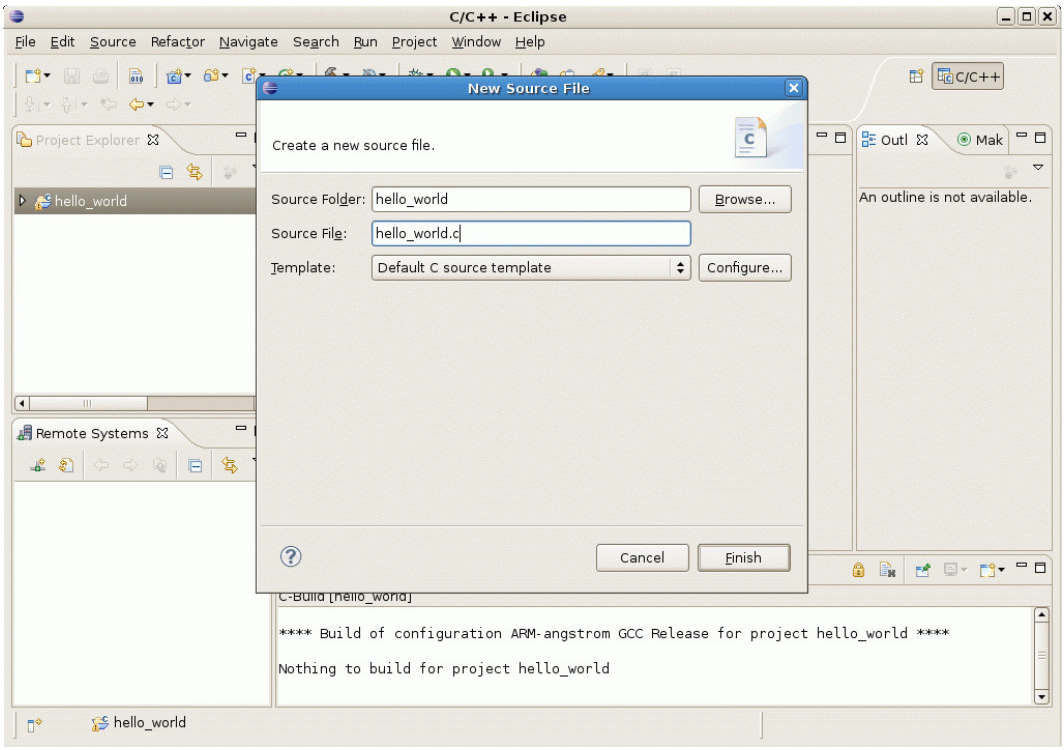


**Figure 2: Creating a new source file**

6. Open the created source file and write a C code like:

```
#include <stdio.h>
int main(int argc, char *argv[]) {
    printf("Hallo Welt!\n");
    return 0;
}
```

7. Save the file (**File > Save** or **CTRL+S**) and build the C program clicking **Project > Build Project**.

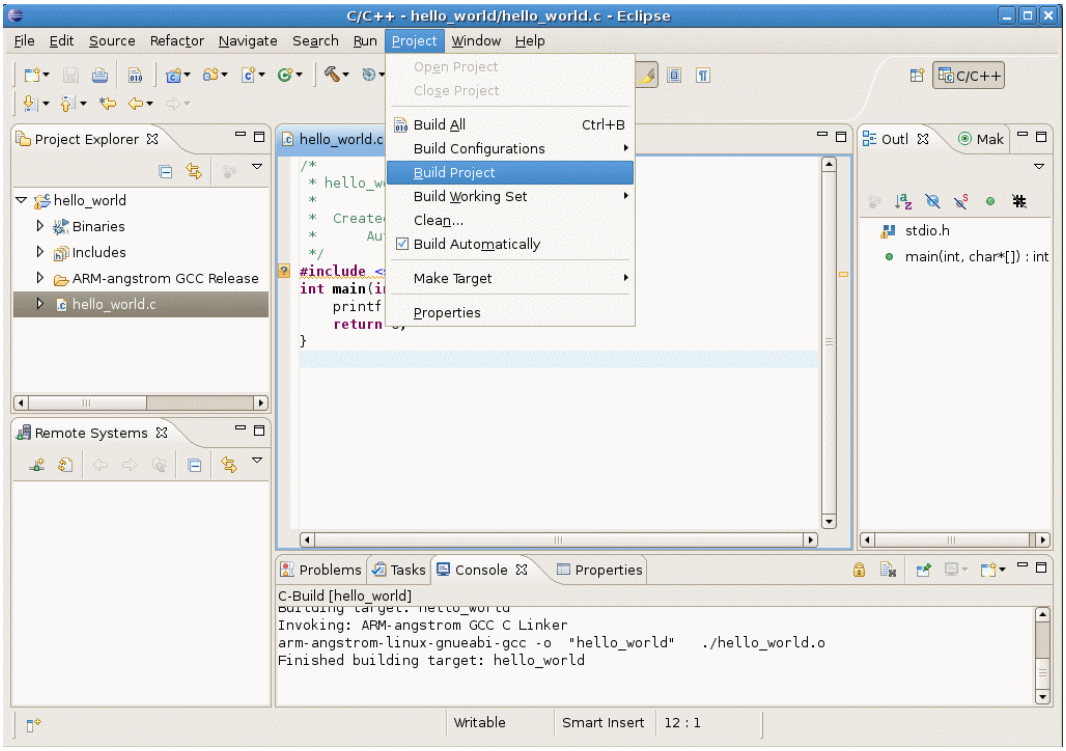


**Figure 3: Building the C program**

# 3 RUNNING A C PROGRAM ON ESOM/9263

**Please note:** To execute the created binary "hello_world" (under **Binaries** in the project tree) on the eSOM/9263 you need to transfer the binary to the eSOM/9263. Eclipse offers the Remote System Explorer (RSE) from the Target Management project. This allows creating SSH, SFTP and FTP connections from Eclipse to a target system (in this case the eSOM/9263) and moving files per drag and drop.

1. Click on this symbol in the **Remote Systems** window on the left side to create a new remote connection with the eSOM/9263.

2. A dialog box opens. Choose **FTP only** and click on **Next**.

3. Enter as **Host name** the IP address of the eSOM/9263: `192.168.0.126`. Enter as **Connection name "eSOM/9263"** and click on **Finish**.

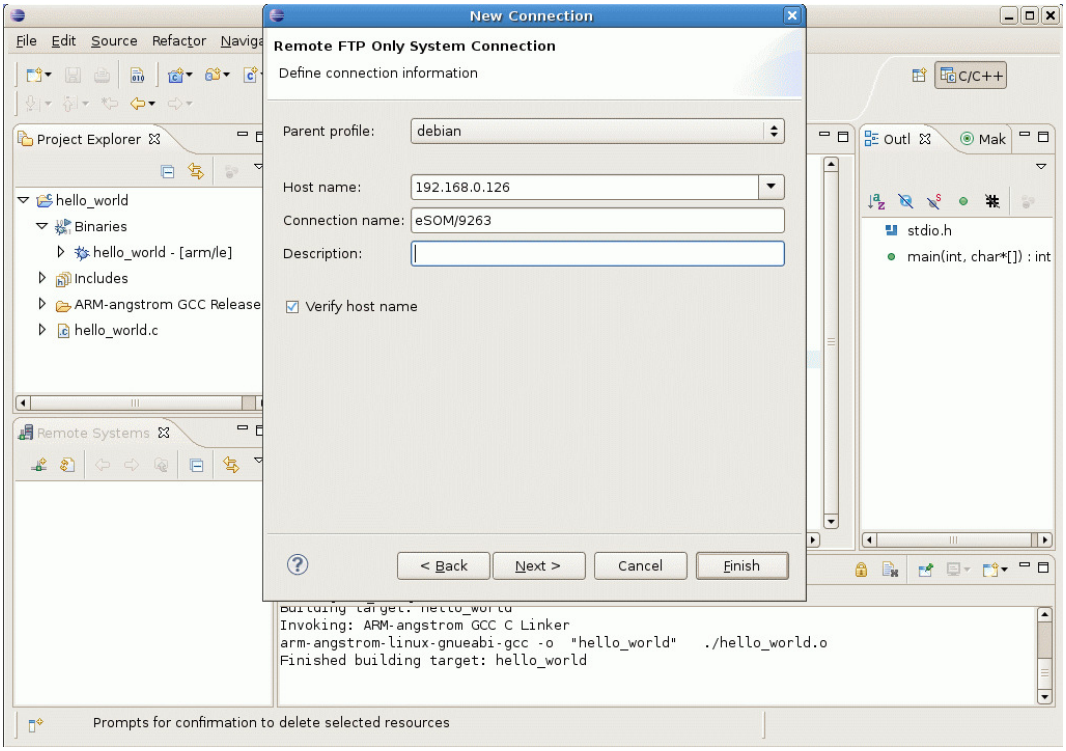


**Figure 4: Creating a new remote connection**

4. Right-click on created **eSOM/9263** connection in the **Remote Systems** window and choose **Connect**. Enter the username **"root"** and password **"root"** and click on **OK**.

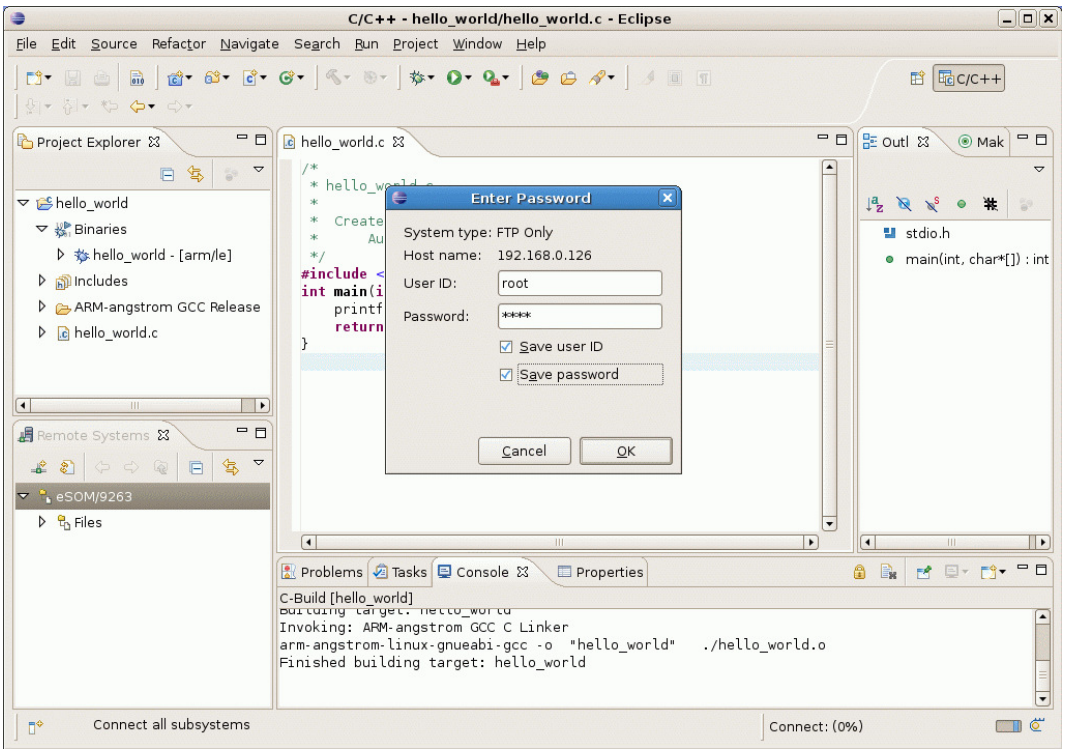


**Figure 5: Connecting with eSOM/9263**

5. Now go through the targets file tree: **eSOM/9263 > Files > Root > / > tmp** and drag and drop there the **hello_world** binary from the **Project Explorer**.

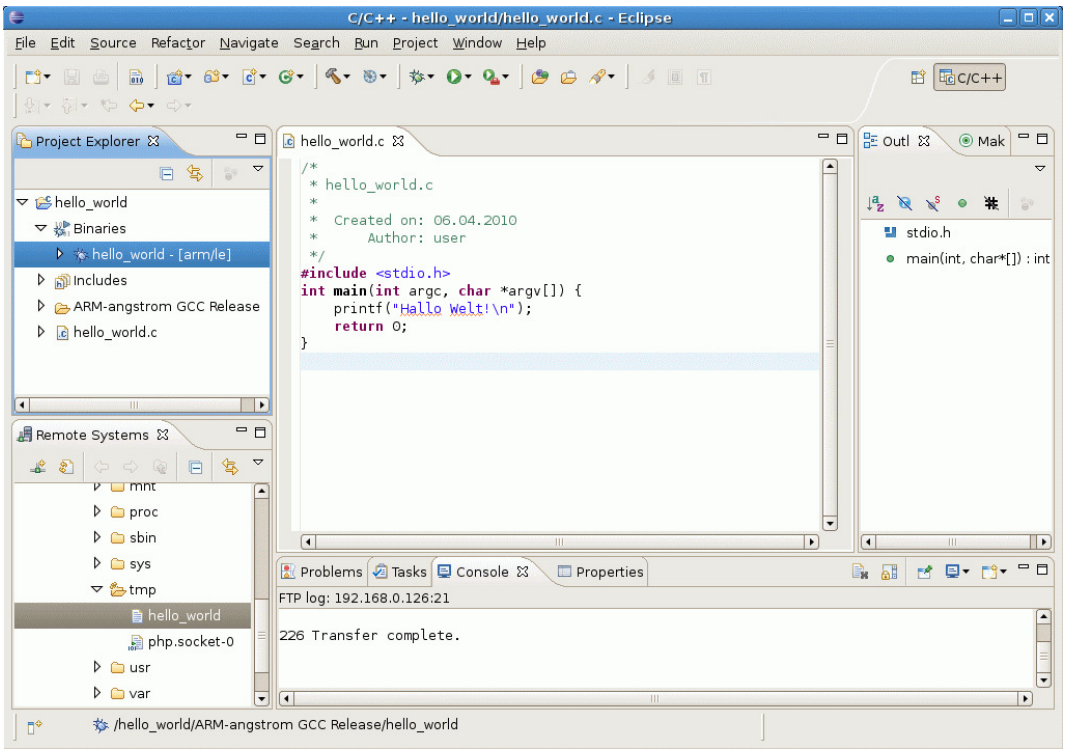


**Figure 6: Transferring the binary to the eSOM/9263**

6. Open a terminal program to create an SSH session via Telnet with the eSOM/9263 and enter:

```
ssh root@192.168.0.126
```

7. Enter as password also **"root"**.

8. Execute the binary entering:

```
chmod +x /tmp/hello_world
/tmp/hello_world
```

The programs output will be **"Hallo Welt!"**.

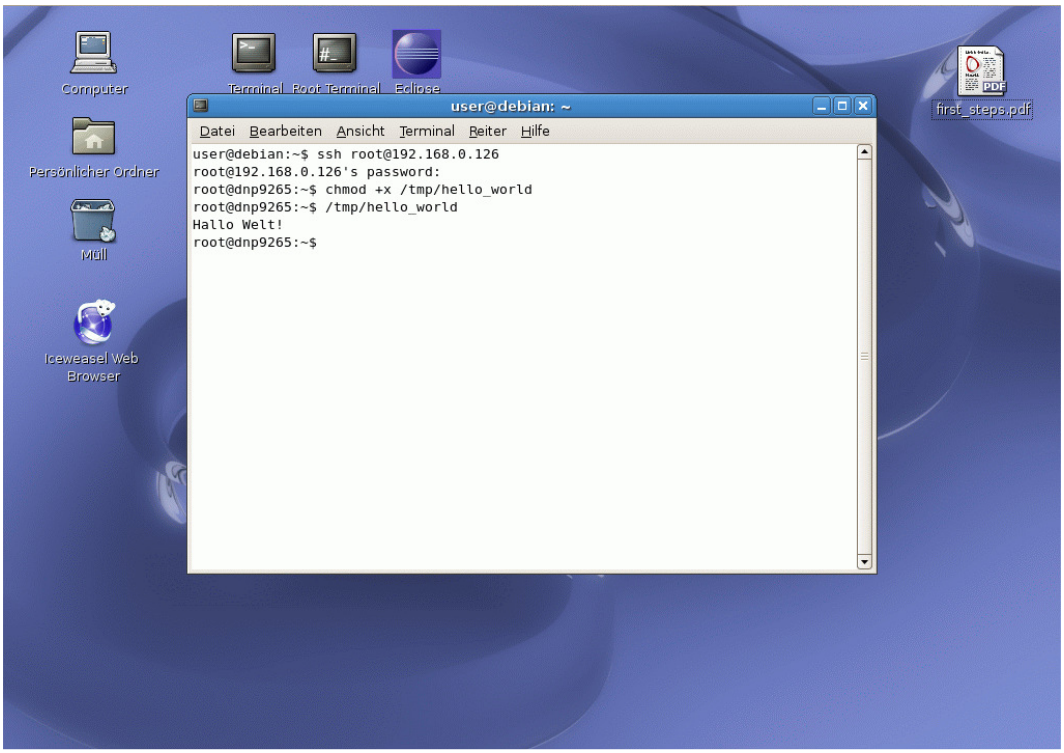


**Figure 7: Running the C program on eSOM/9263**

# 4 DEBUGGING A C PROGRAM

1. Create a new debug configuration clicking on **Run > Debug Configurations**.

2. Under the tab **Main** enter a name, e.g. **"hello_world Debug"** and set the **Build Configuration** to **Debug**.

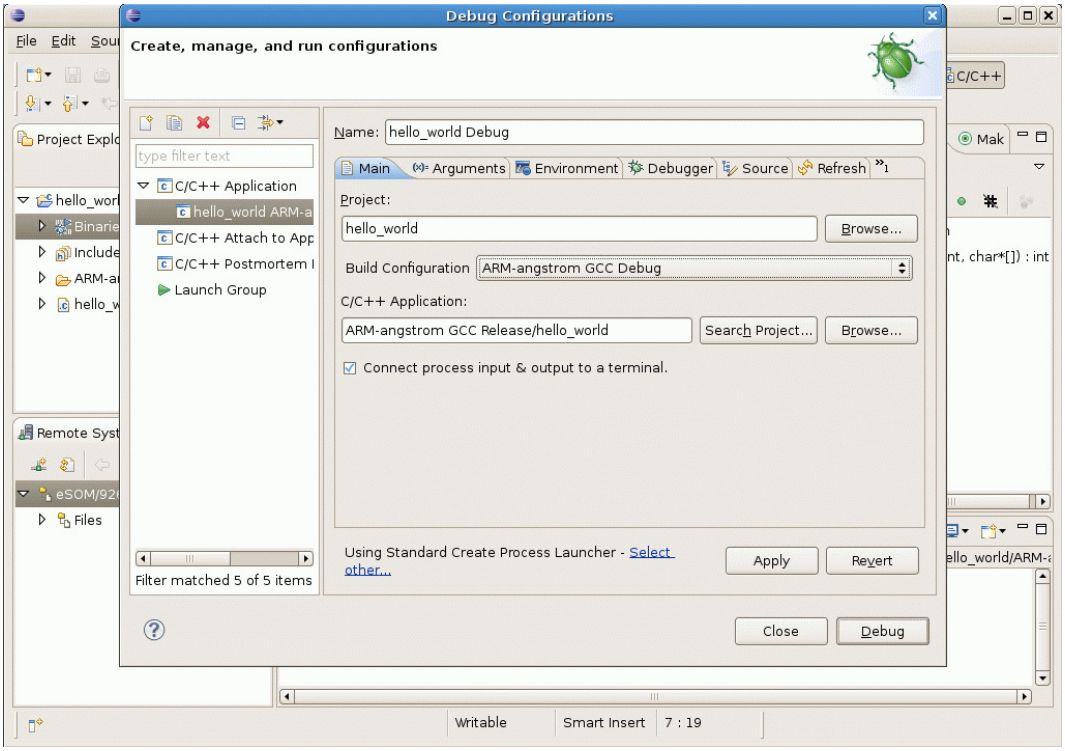


**Figure 8: Creating a new debug configuration**

3. Under the tab **Debbuger** choose as **Debugger** the **gdbserver Debugger** and set the **GDB debugger** to **arm-angstrom-linux-gnueabi-gdb**.

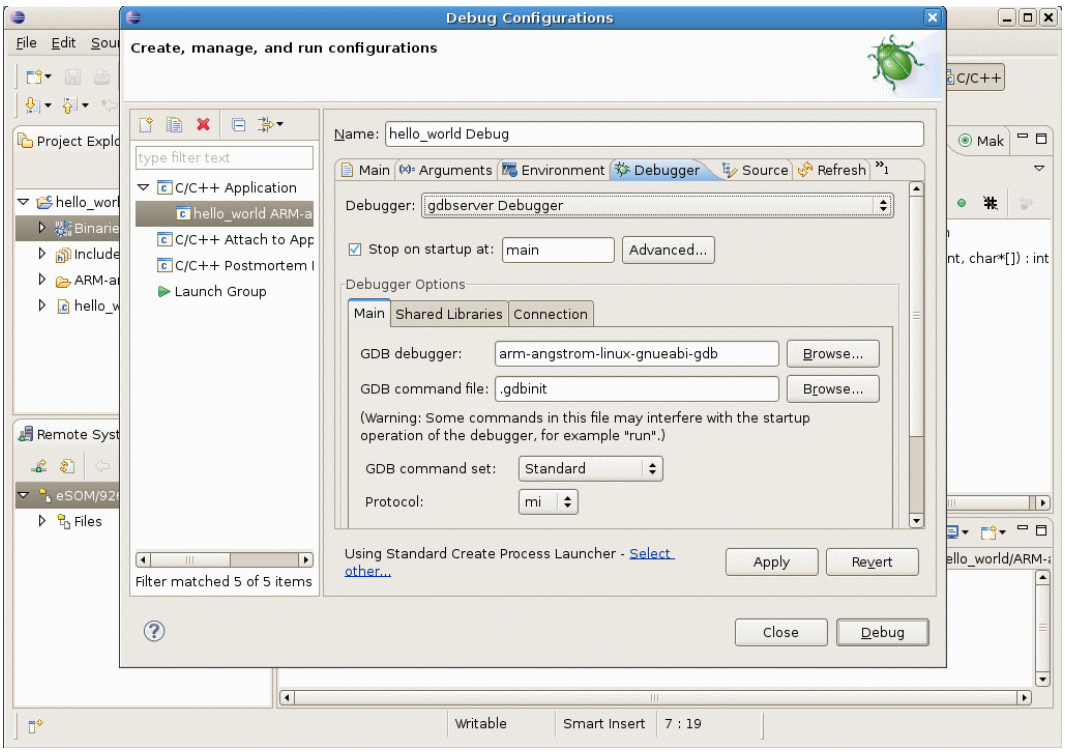


**Figure 9: Creating a new debug configuration**

4. Under the subtab **Connection** set the **Type** to **TCP**, enter the **IP address** of the eSOM/9263 and a **Port number**, e.g. **2222**. There will run the gdbserver.

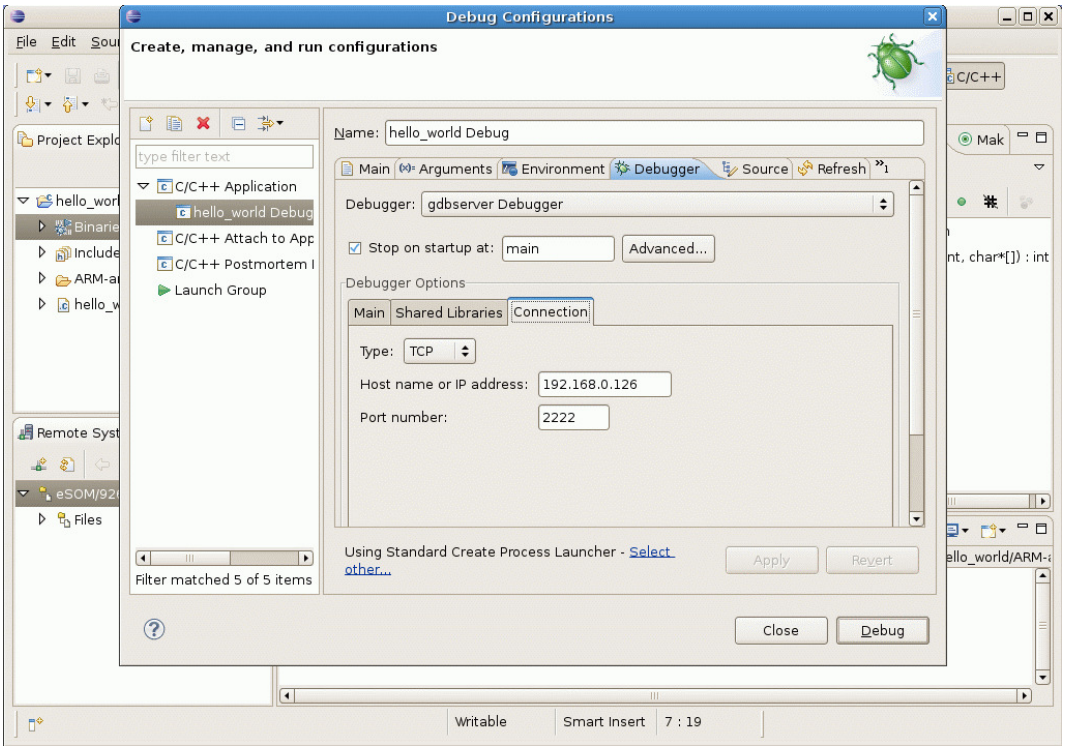


**Figure 10: Creating a new debug configuration**

5. Under the tab **Common** unselect **Allocate Console** and click on **Apply** and **Close**.

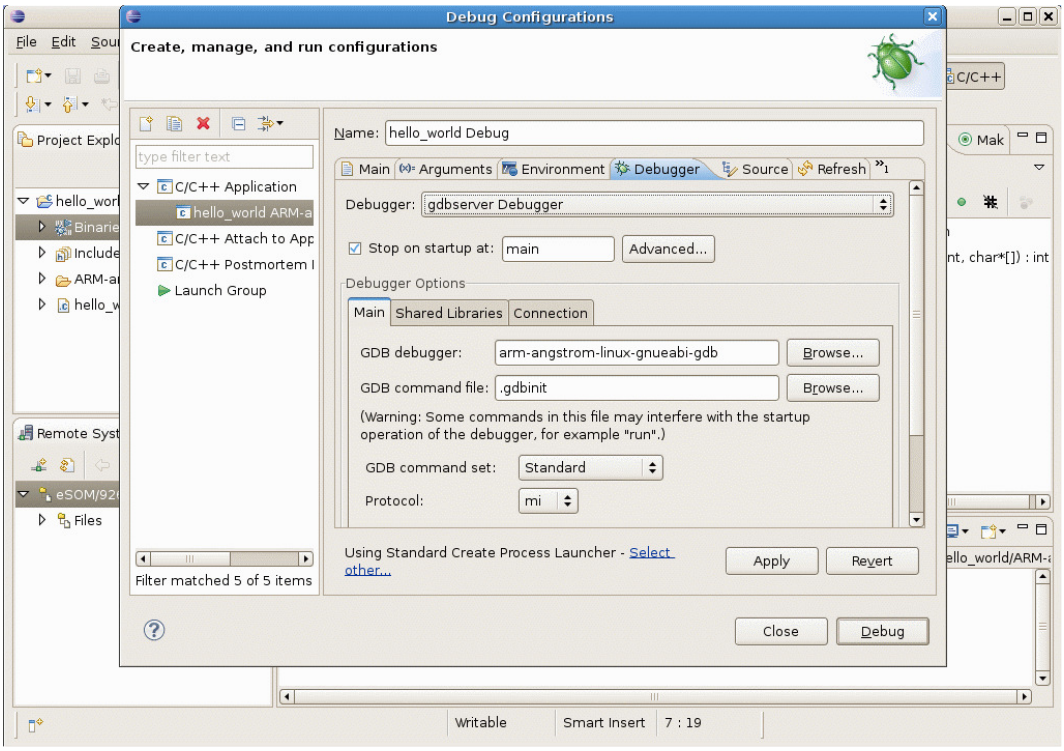


**Figure 11: Creating a new debug configuration**

6. Build the debug version of your program clicking on the **Hammer** symbol in the toolbar and select **ARM-angstrom GCC debug**.

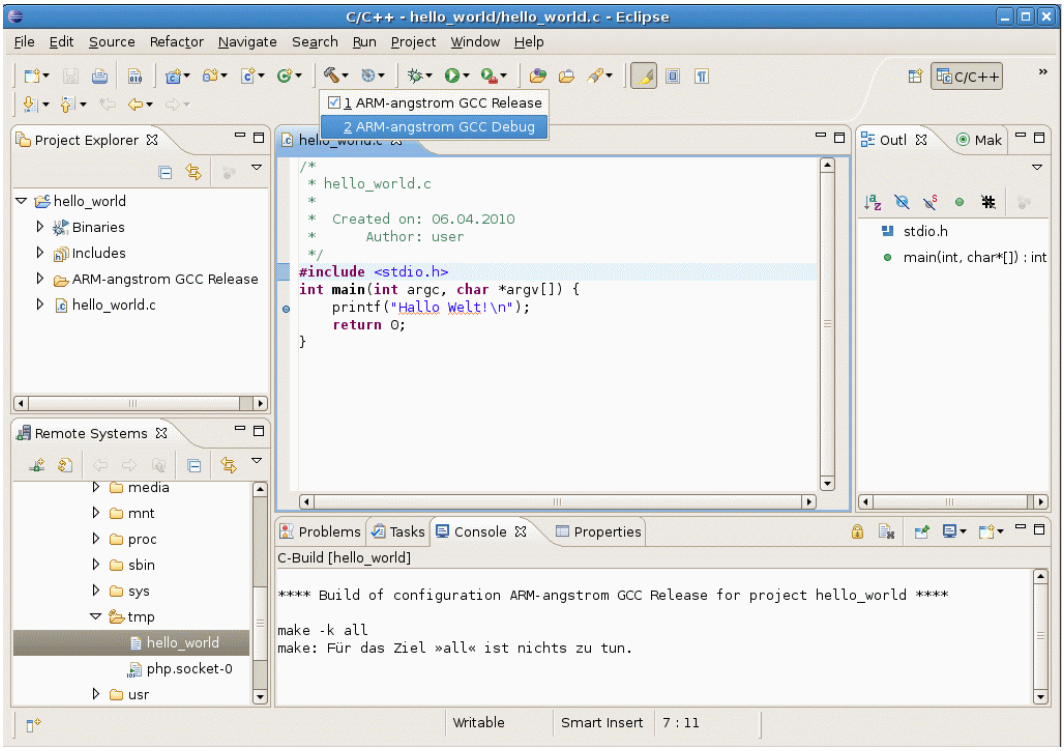


**Figure 12: Building the debug version of the C program**

7. Transfer the debug binary from **Project Explorer > ARM-angstrom GCC Debug** to the eSOM/9263 per drag and drop (refer to chapter 3). Confirm the question to overwrite the existing binary with **OK**.

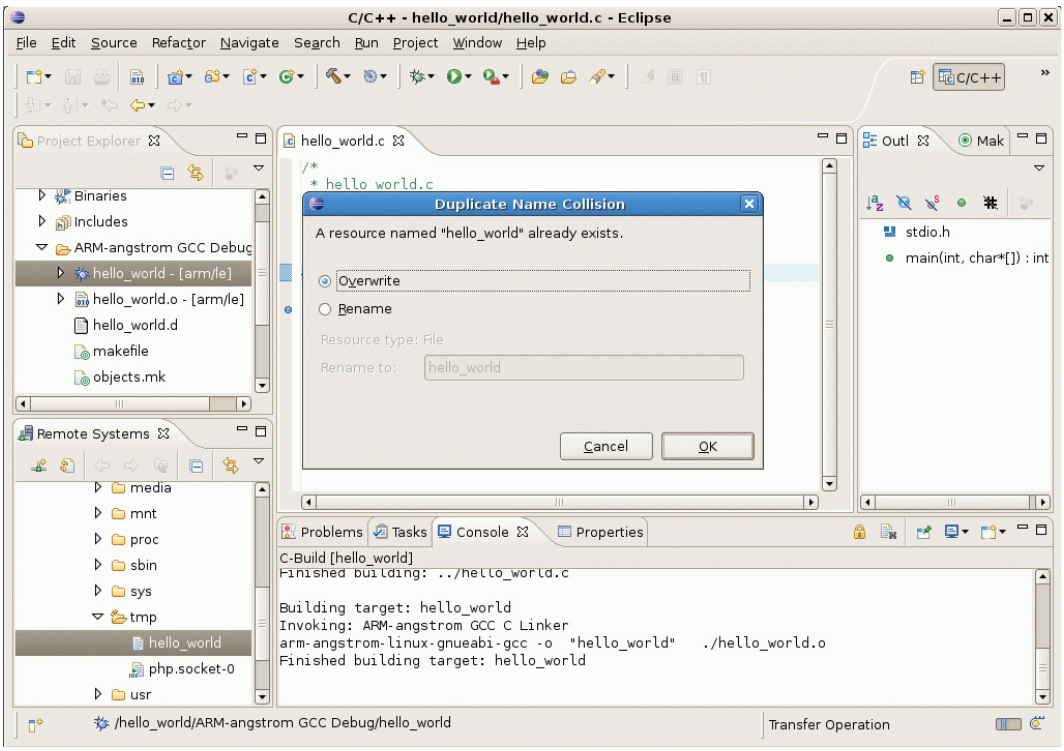


**Figure 13: Transferring the debug binary to the eSOM/9263**

8. To run the binary on the eSOM/9263 with gdbserver, first create an SSH session with username and password **"root"**:

```
ssh root@192.168.0.126
```

9. Set the executable rights to the binary:

```
chmod +x /tmp/hello_world
```

10. Start gdbserver with the IP address of the development system and the configured port number:

```
gdbserver 129.168.0.235:2222 /tmp/hello_world
```

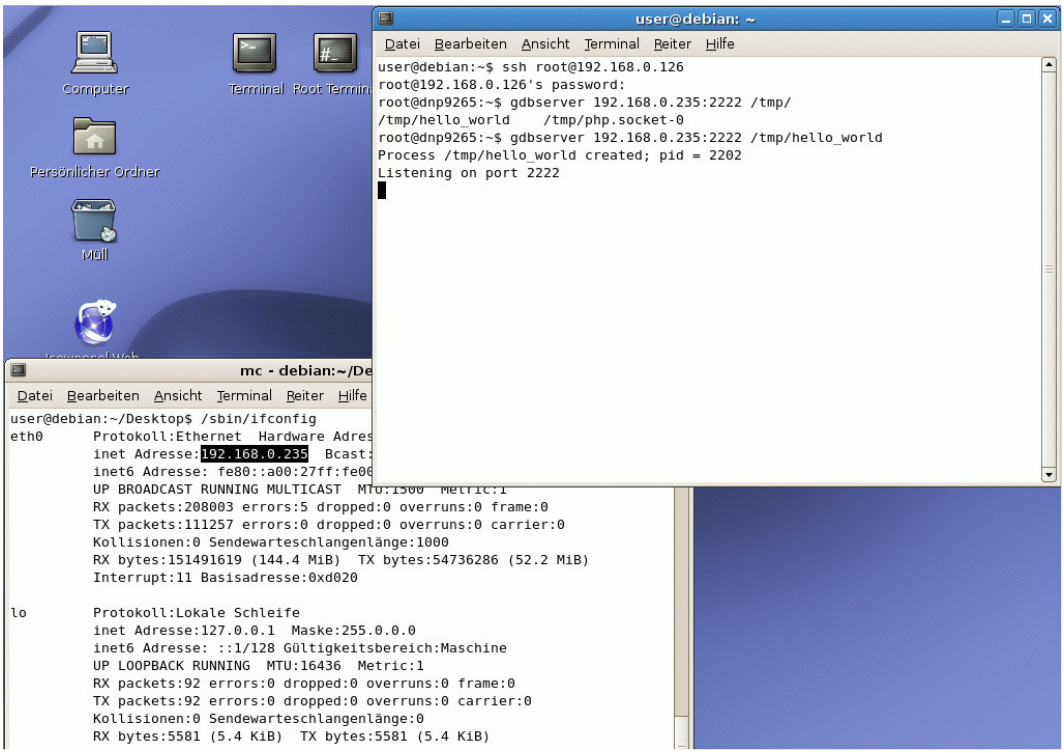


**Figure 14: Starting gdbserver**

11. Run the **debbuger** in Eclipse with the **debug** symbol in the toolbar or with **F11** and confirm the appearing question with **Yes**.

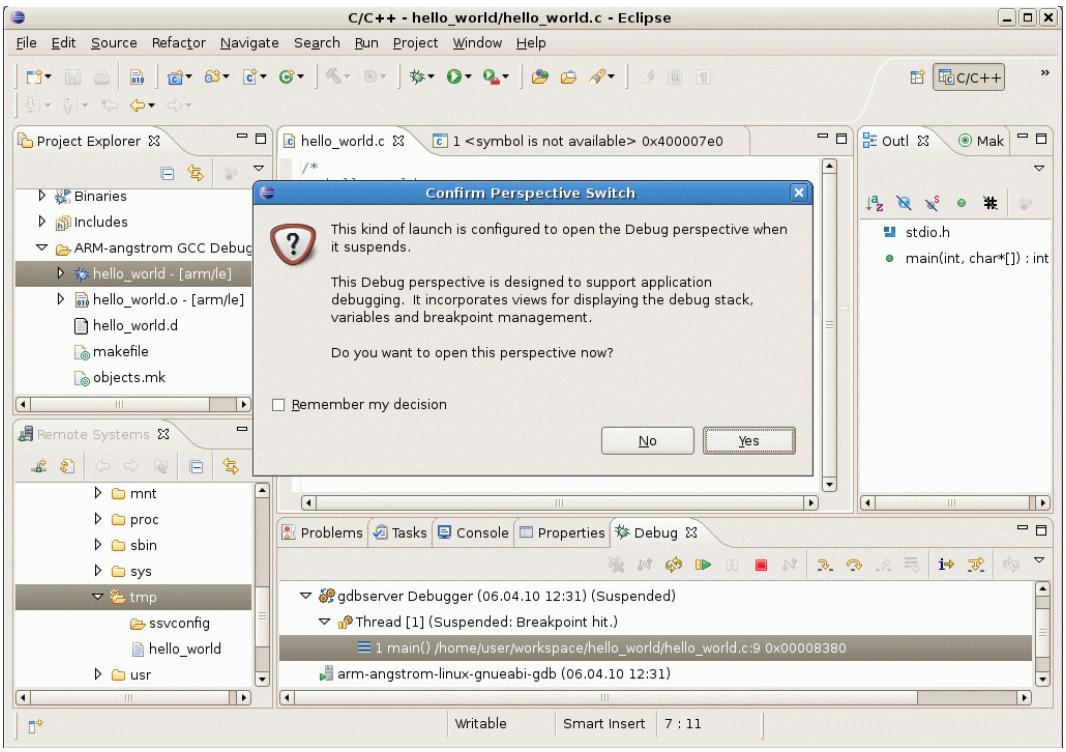


**Figure 15: Starting the debugger in Eclipse**

**Please Note:** To debug you always need to have the same versions of binaries on the target (eSOM/9263) and the host (development system)! So do not forget to transfer the binary if it was builded new. First start the gdbserver on the target before starting and connecting it with the Eclipse debbuger!

# 5 HELPFUL LITERATURE

- eSOM/9263 hardware reference manual
- Website Eclipse IDE: `http://www.eclipse.org`

# CONTACT

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|---|---|---|---|
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