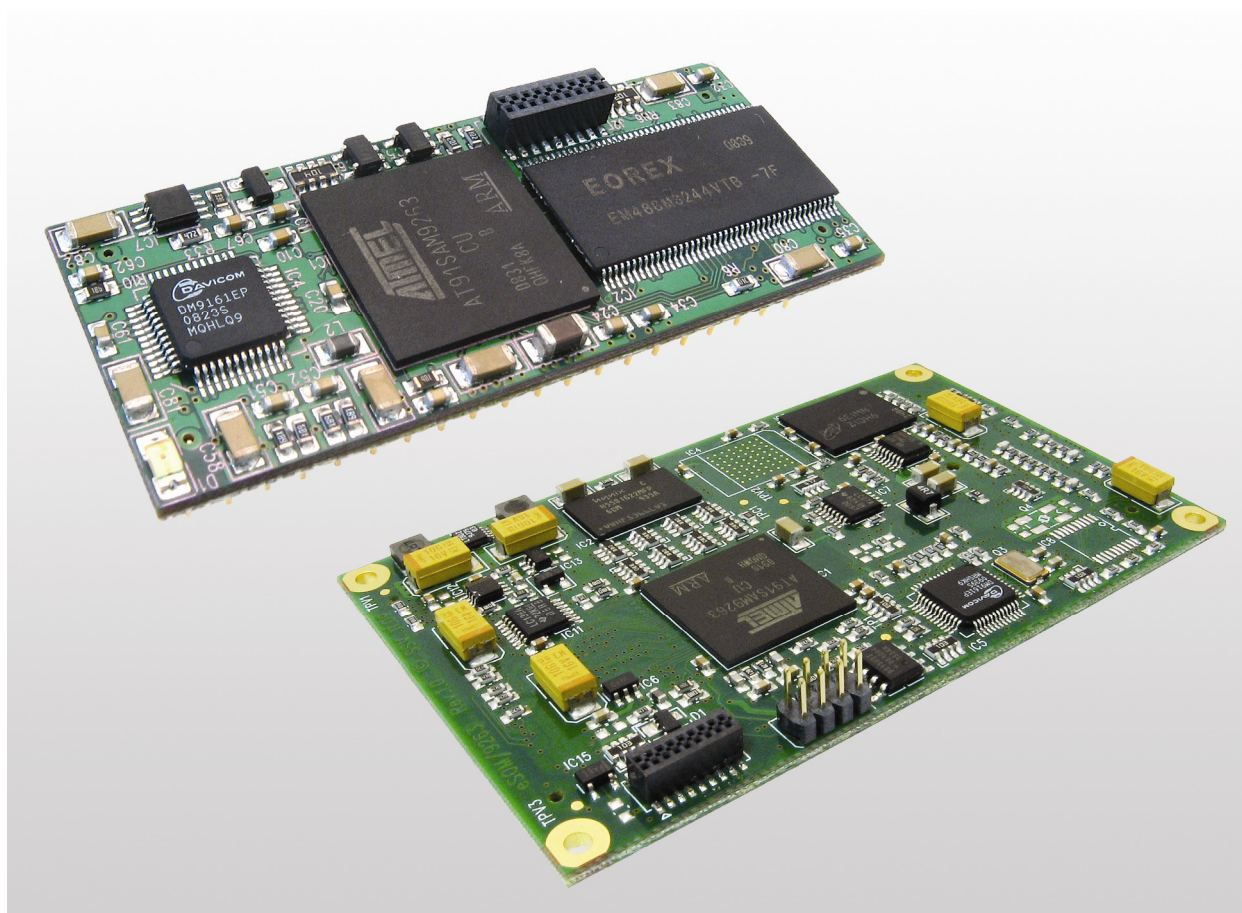


eSOM/9263, DNP/9265 ***Creating a C-Program***

microHowTo



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Manual Revision: 1.1
Date: 2010-09-13

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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

1.2 Blockdiagram DNP/9265

The DNP/9265 and the eSOM/9263 are very similar devices. Both are based on the Atmel AT91SAM9263 MCU and an embedded Linux operating system with kernel version 2.6. For application development you can use the same GNU ARM cross tool chain. The embedded Linux run time environment is identical. In other words: you can run the same binaries.

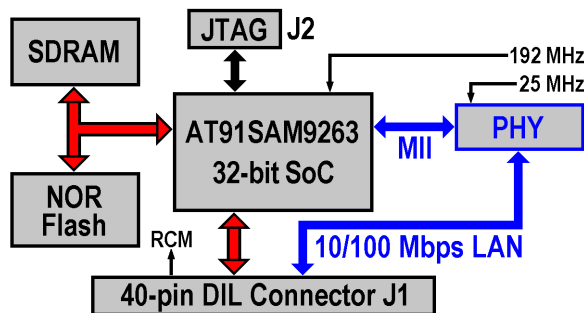


Figure 1: Blockdiagram DNP/9265

1.3 Blockdiagram eSOM/9263

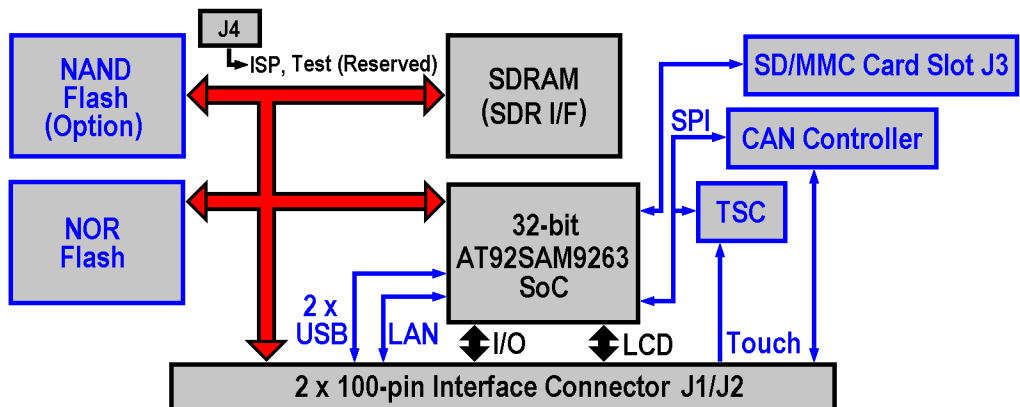


Figure 2: Blockdiagram eSOM/9263

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**.

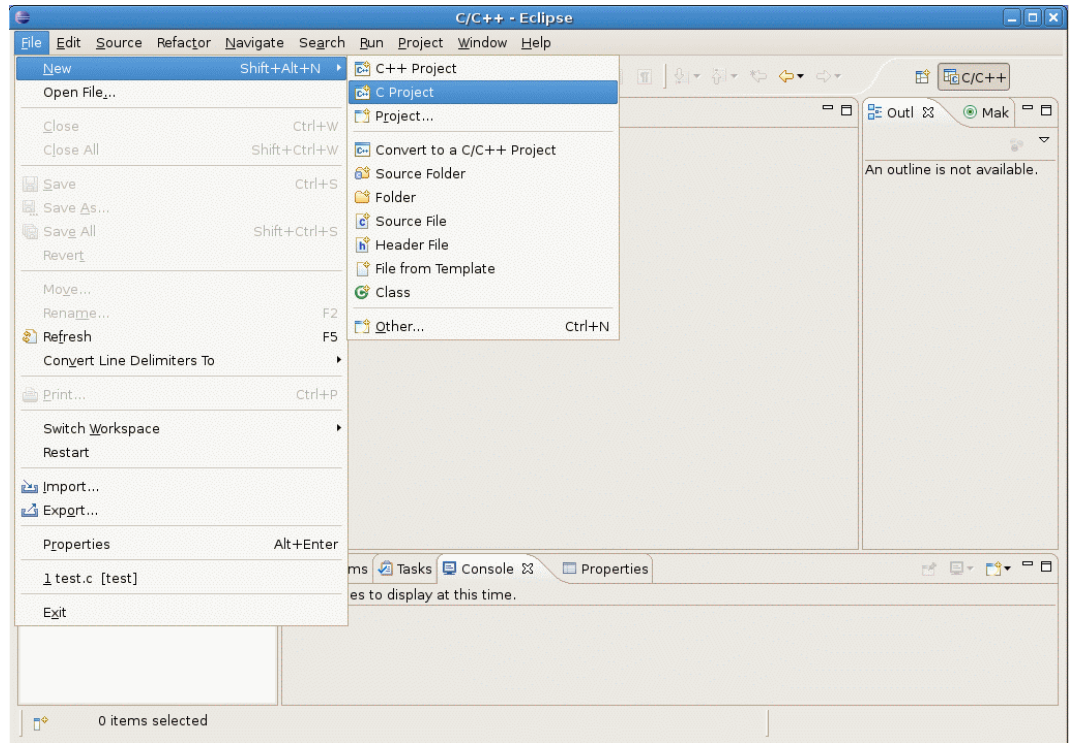


Figure 3: Creating a new project

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**.

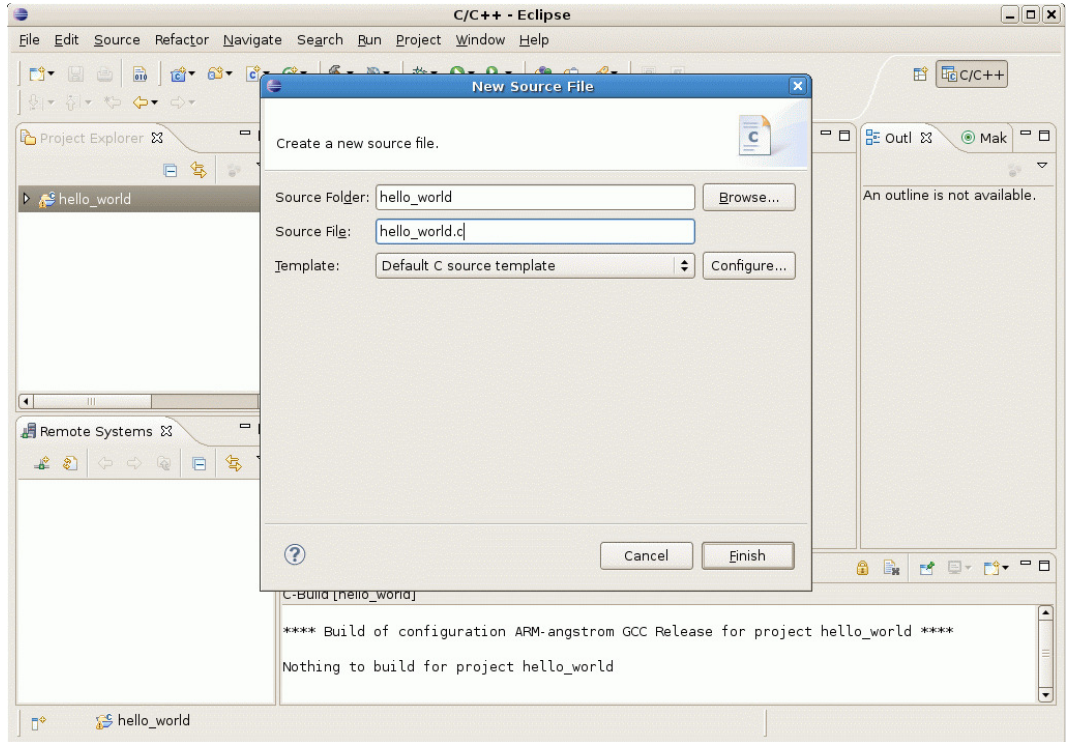


Figure 4: Creating a new source file

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**.

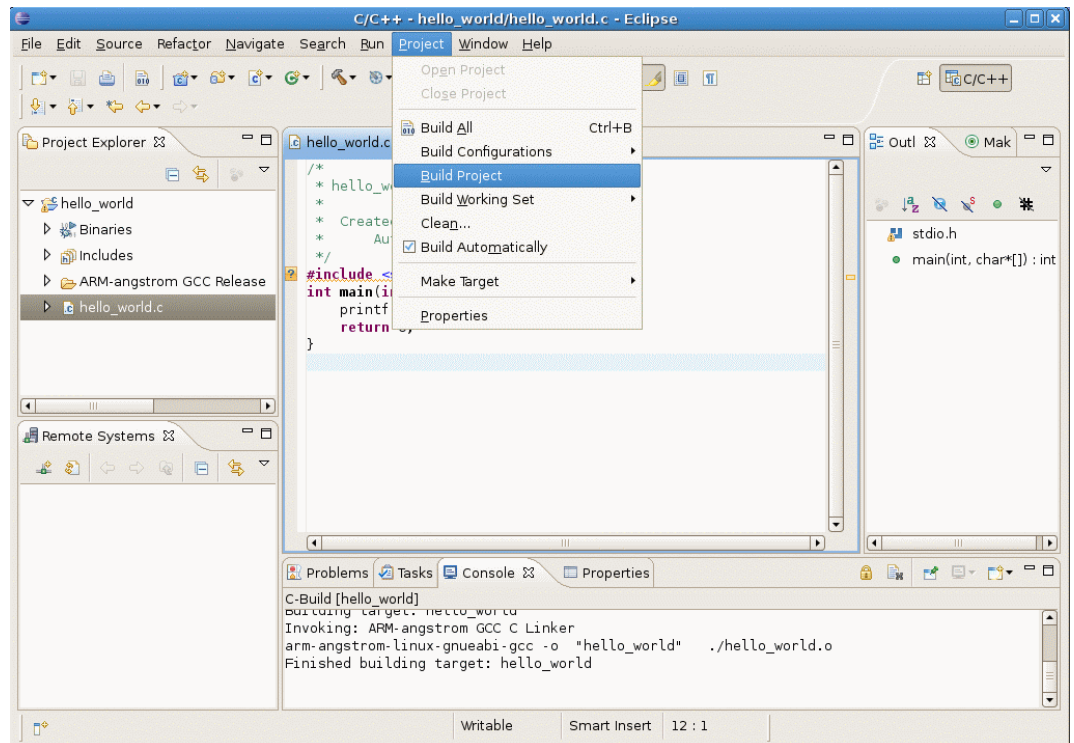



Figure 5: Building the C program

3 RUNNING A C PROGRAM

Please note: To execute the created binary “hello_world” (under **Binaries** in the project tree) on the eSOM/9263 or DNP/9265 you need to transfer the binary to the eSOM/9263 or DNP/9265. 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 or DNP/9265) 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 or DNP/9265.
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” (or DNP/9265) and click on **Finish**.

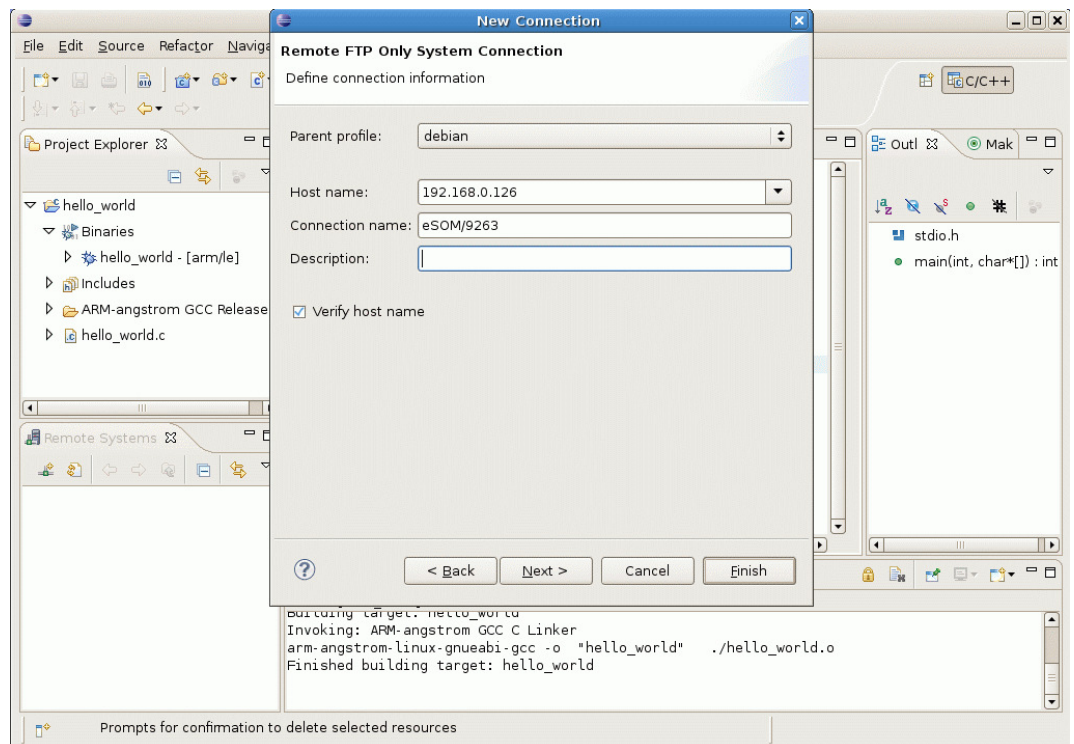


Figure 6: Creating a new remote connection

- 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**.

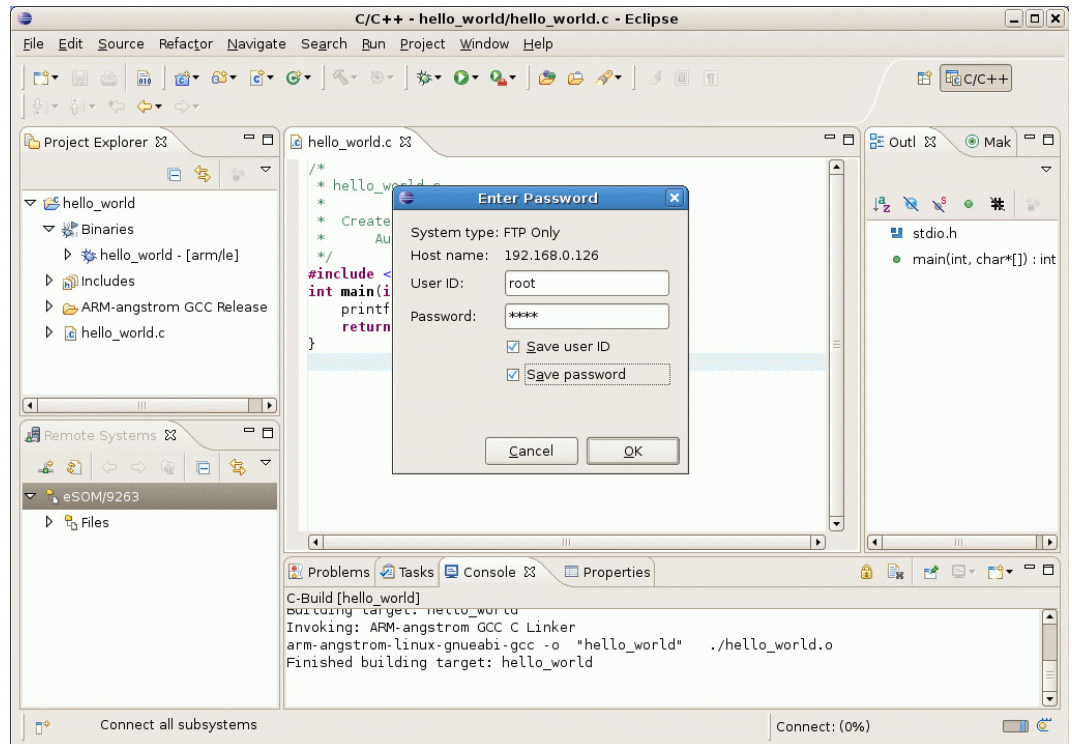


Figure 7: Connecting with eSOM/9263 or DNP/9265

- 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**.

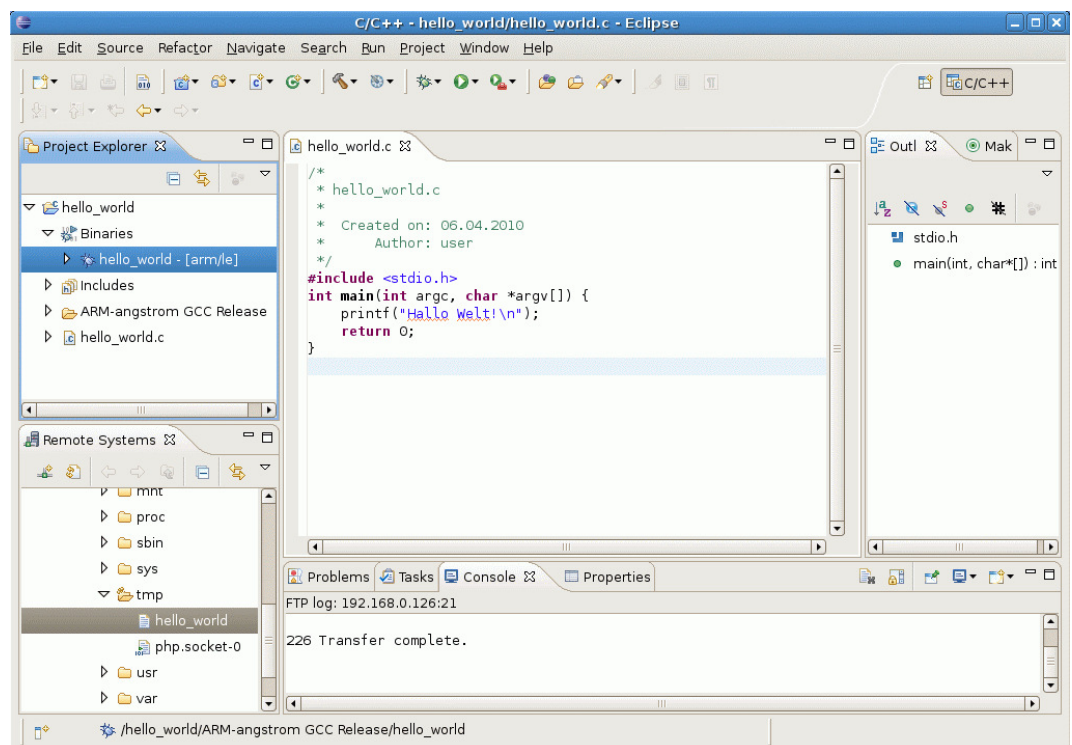


Figure 8: Transferring the binary to the eSOM/9263 or DNP/9265

6. Open a terminal program to create an SSH session via Telnet with the eSOM/9263 or DNP/9265 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!”.

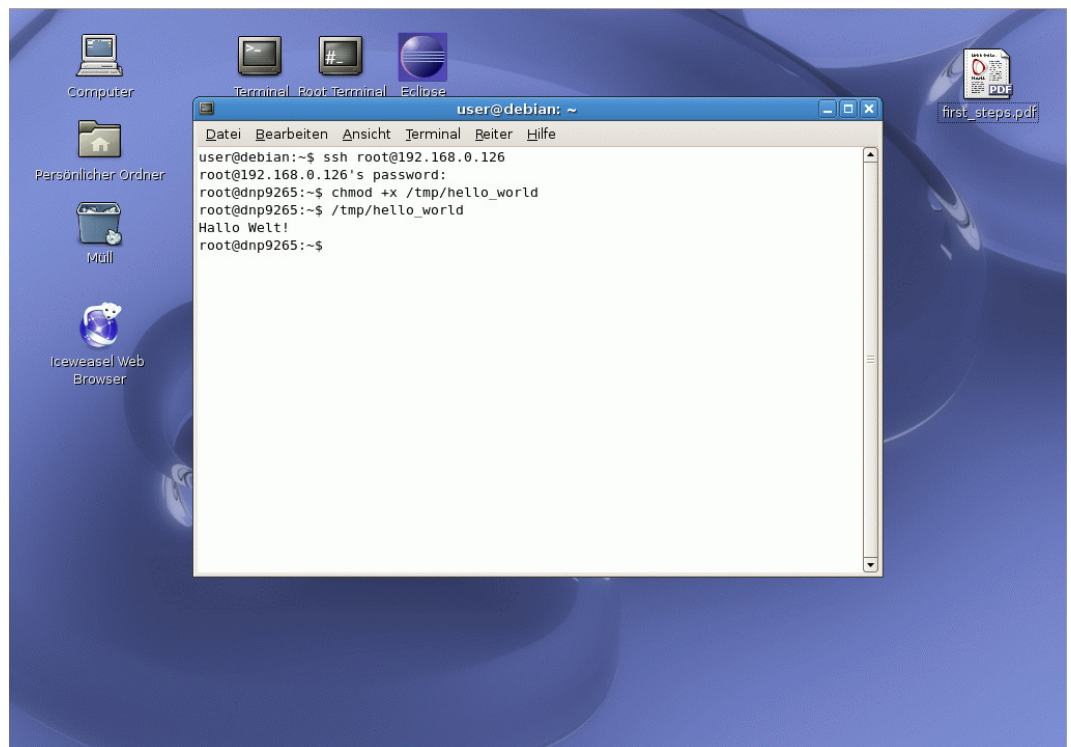


Figure 9: Running the C program on eSOM/9263 or DNP/9265

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**.

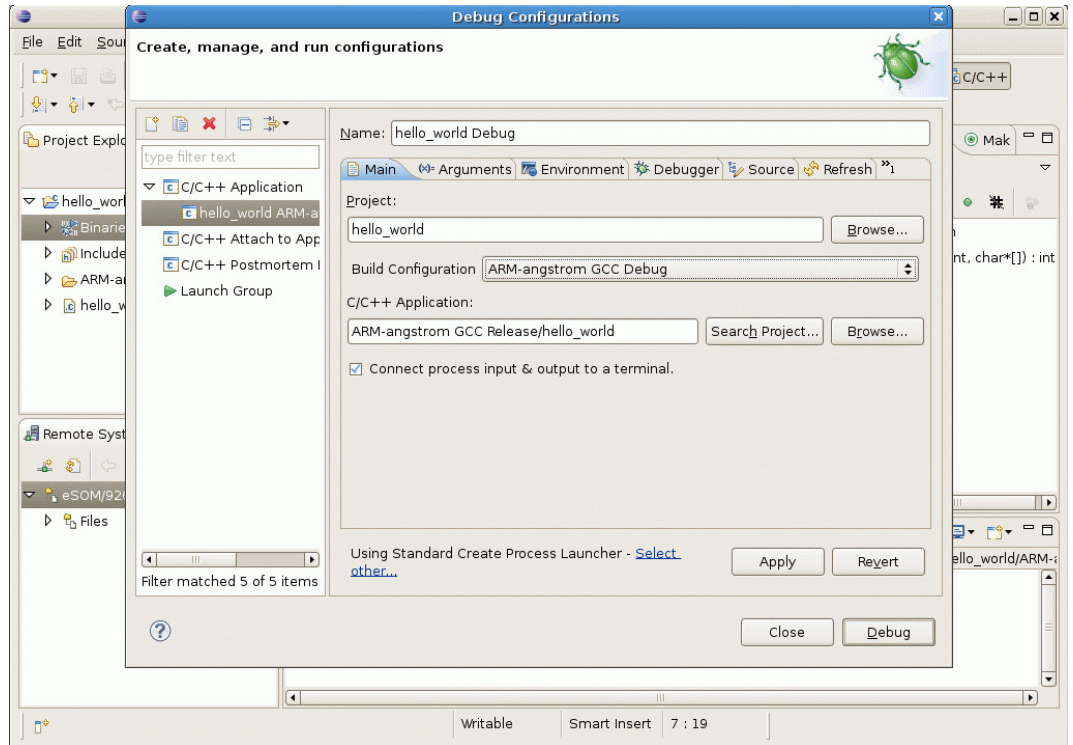


Figure 10: Creating a new debug configuration

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

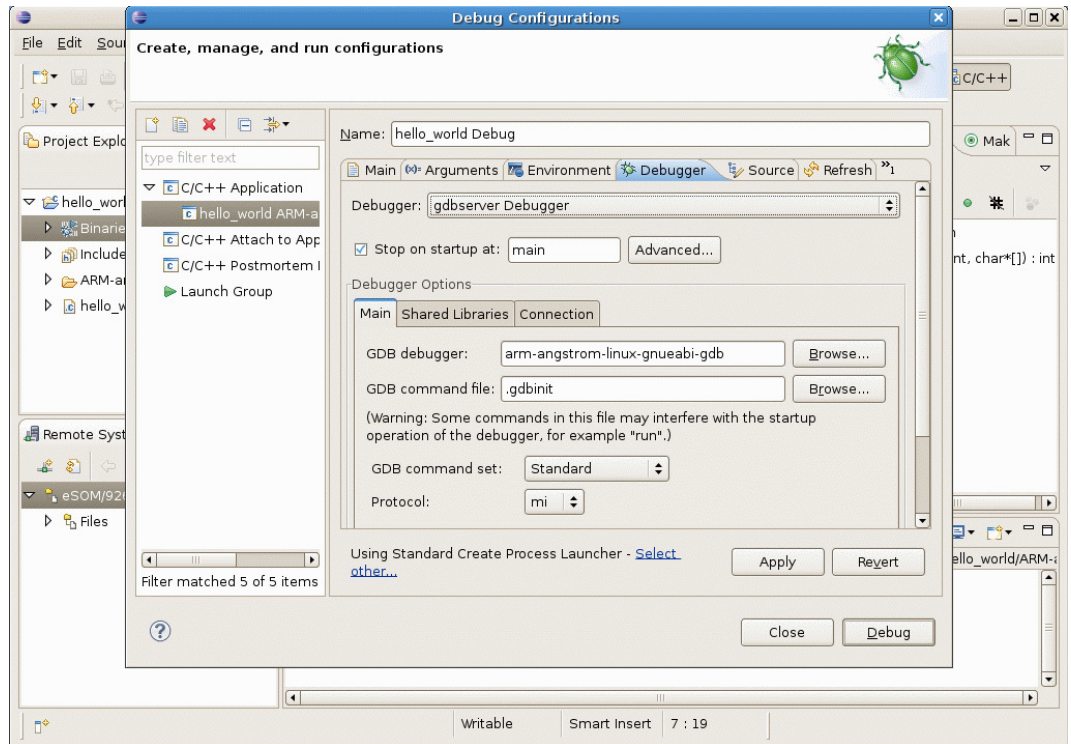


Figure 11: Creating a new debug configuration

- Under the subtab **Connection** set the **Type** to **TCP**, enter the **IP address** of the eSOM/9263 or DNP/9265 and a **Port number**, e.g. **2222**. There will run the gdbserver.

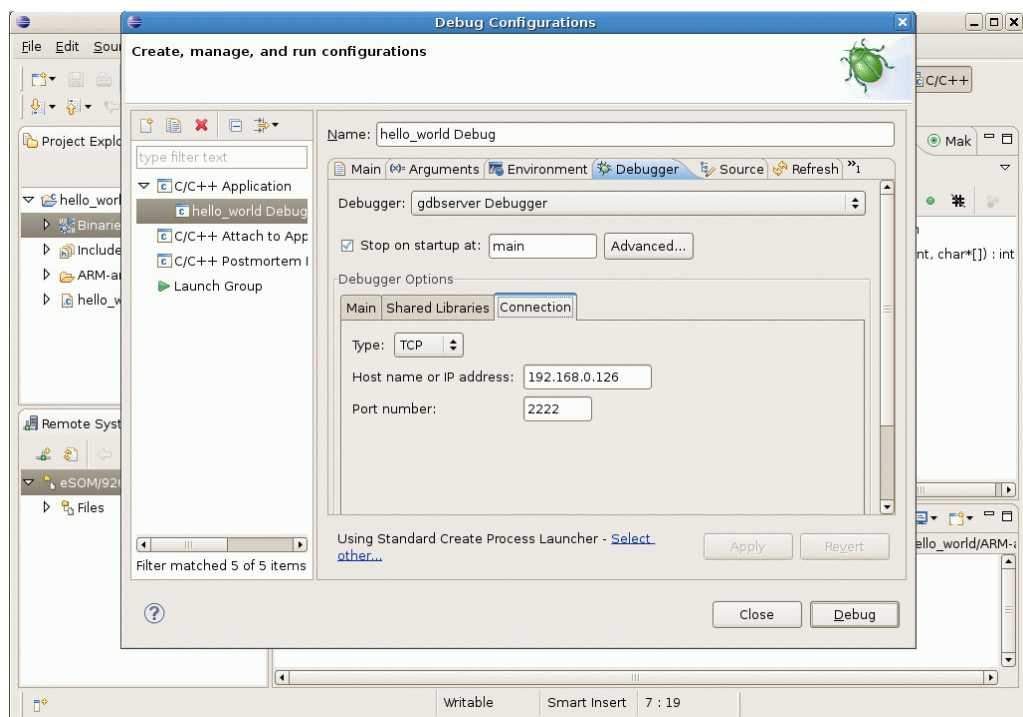


Figure 12: Creating a new debug configuration

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

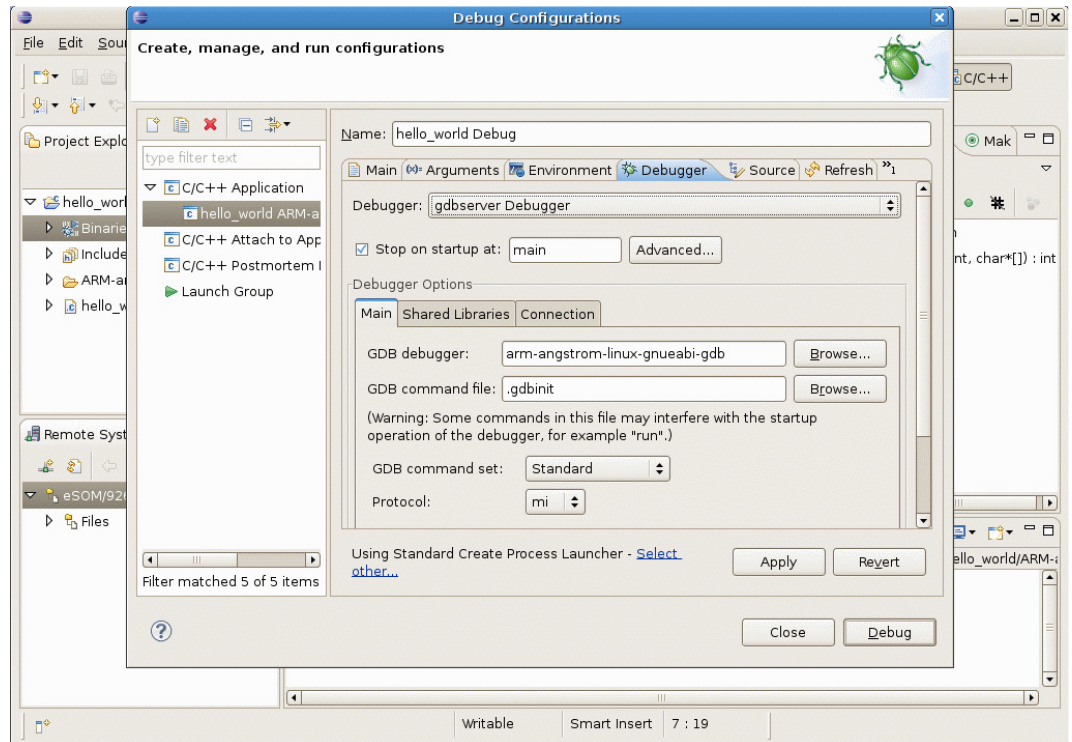


Figure 13: Creating a new debug configuration

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

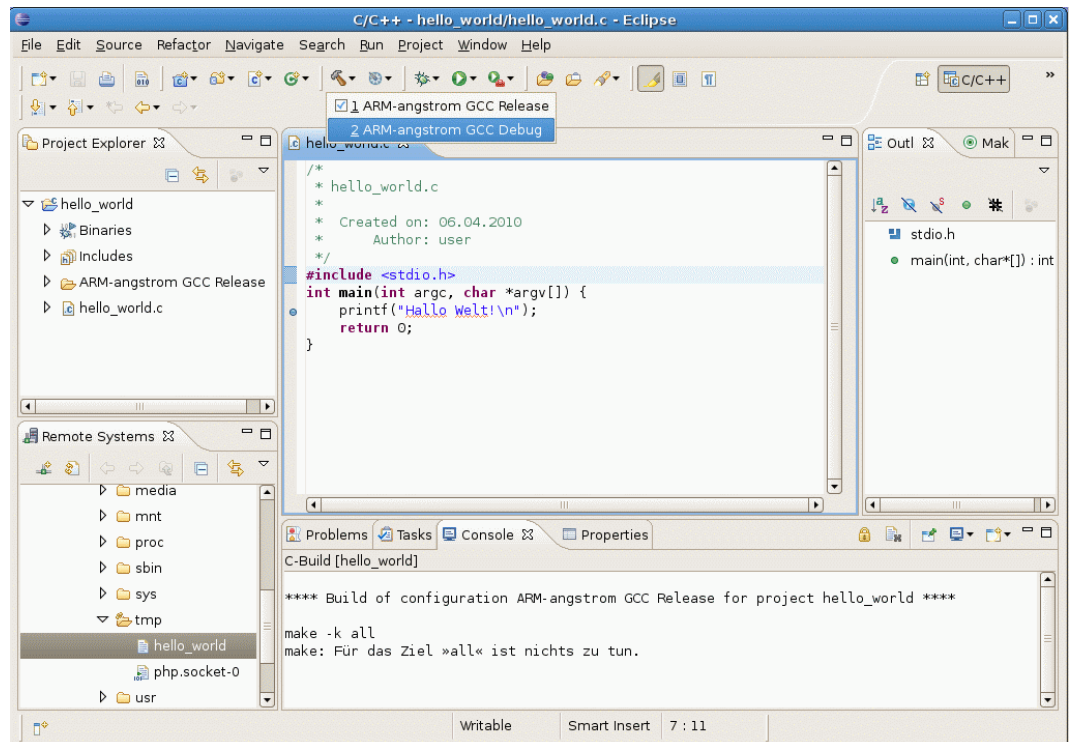


Figure 14: Building the debug version of the C program

7. Transfer the debug binary from **Project Explorer** > **ARM-angstrom GCC Debug** to the eSOM/9263 or DNP/9265 per drag and drop (refer to chapter 3). Confirm the question to overwrite the existing binary with **OK**.

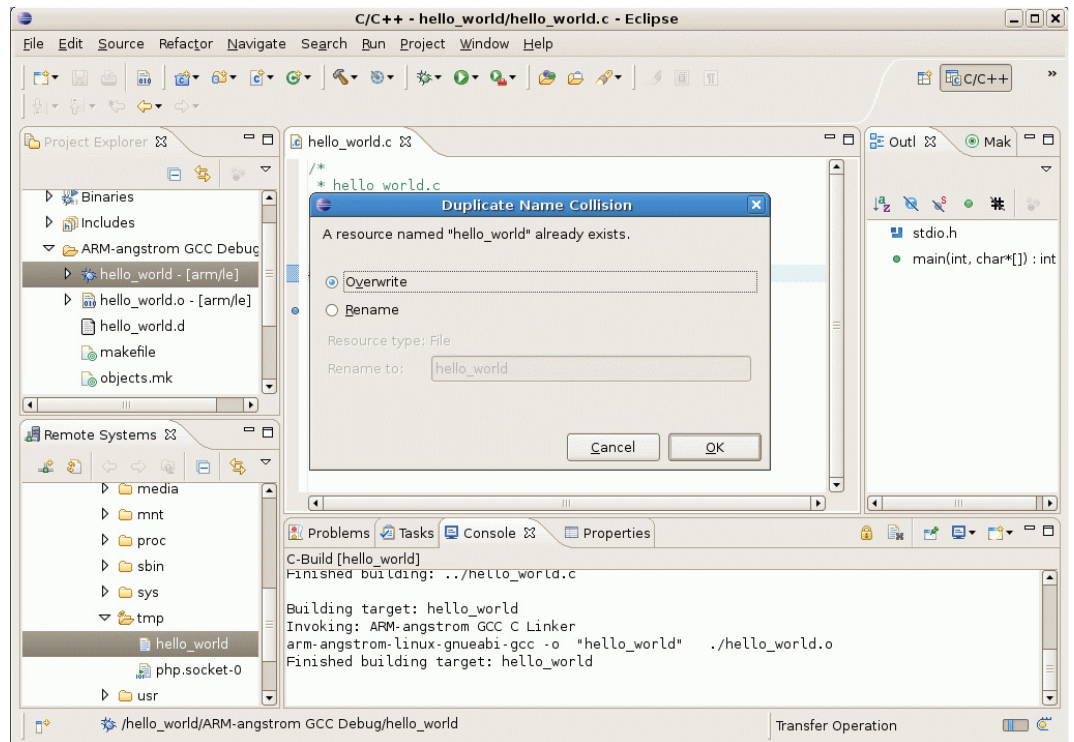


Figure 15: Transferring the debug binary to the eSOM/9263 or DNP/9265

8. To run the binary on the eSOM/9263 or DNP/9265 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
```

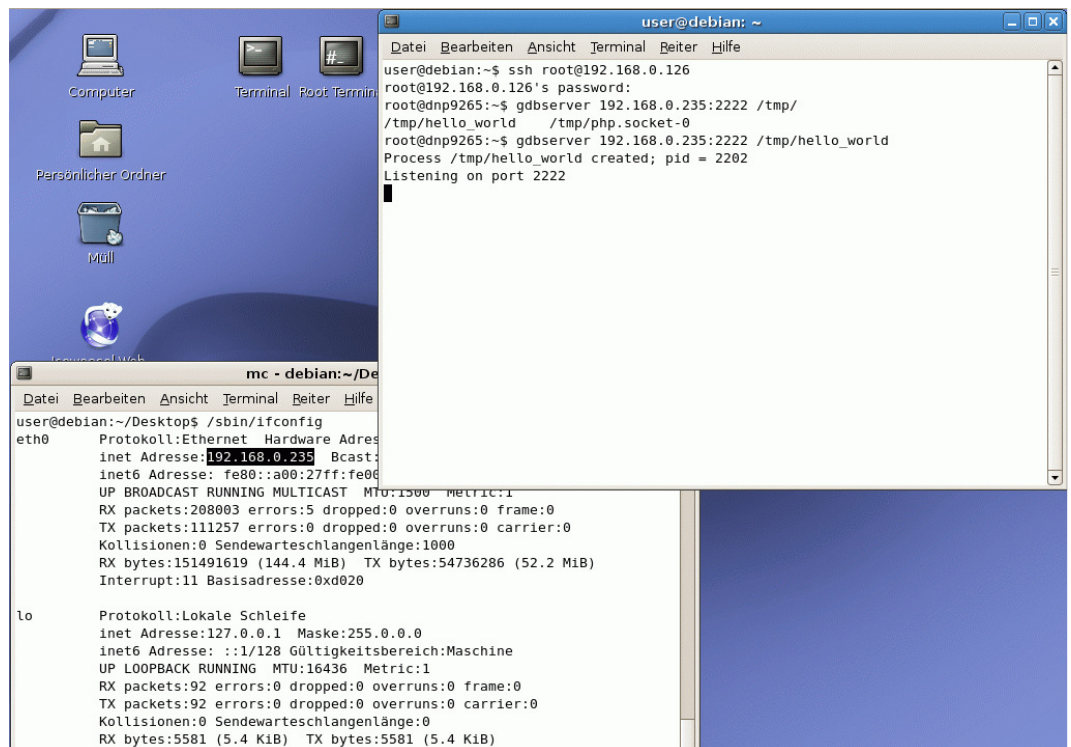


Figure 16: Starting gdbserver

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

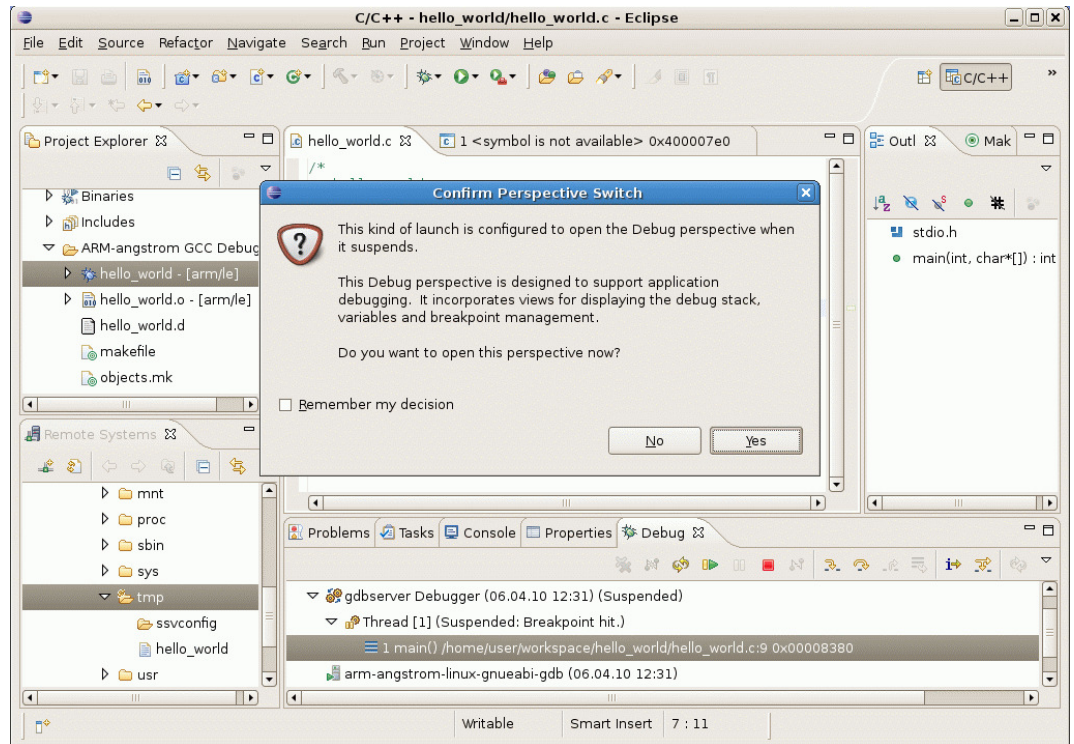


Figure 17: Starting the debugger in Eclipse

Please Note: To debug you always need to have the same versions of binaries on the target (eSOM/9263 or DNP/9265) 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 debugger!

5 HELPFUL LITERATURE

- eSOM/9263 hardware reference manual
- DNP/9265 hardware reference manual
- Website Eclipse IDE: <http://www.eclipse.org>

CONTACT

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DOCUMENT HISTORY

Revision	Date	Remarks	Name
1.0	2010-04-09	first version	WBU
1.1	2010-09-13	chapter 1.2 and 1.3 added	WBU

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