Cinterion® Concept Board

Start-up Guide

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Contents

Tables

Figures

Introduction

This document explains the first steps you need to complete before starting to work with the Cinterion® Concept Board.

We will now go step-by-step through the following points:
- How to connect the Concept Board to your PC
- How to communicate with the EHS6 module through AT commands
- How to turn LEDs on and off
- How to make a phone call

For a detailed overview of the Concept Board hardware, please refer to [1].

1.1   Concept Board Overview

All connectors, switches, buttons and LEDs on the Concept Board, are marked in this text by an orange rectangle, e.g. START button.
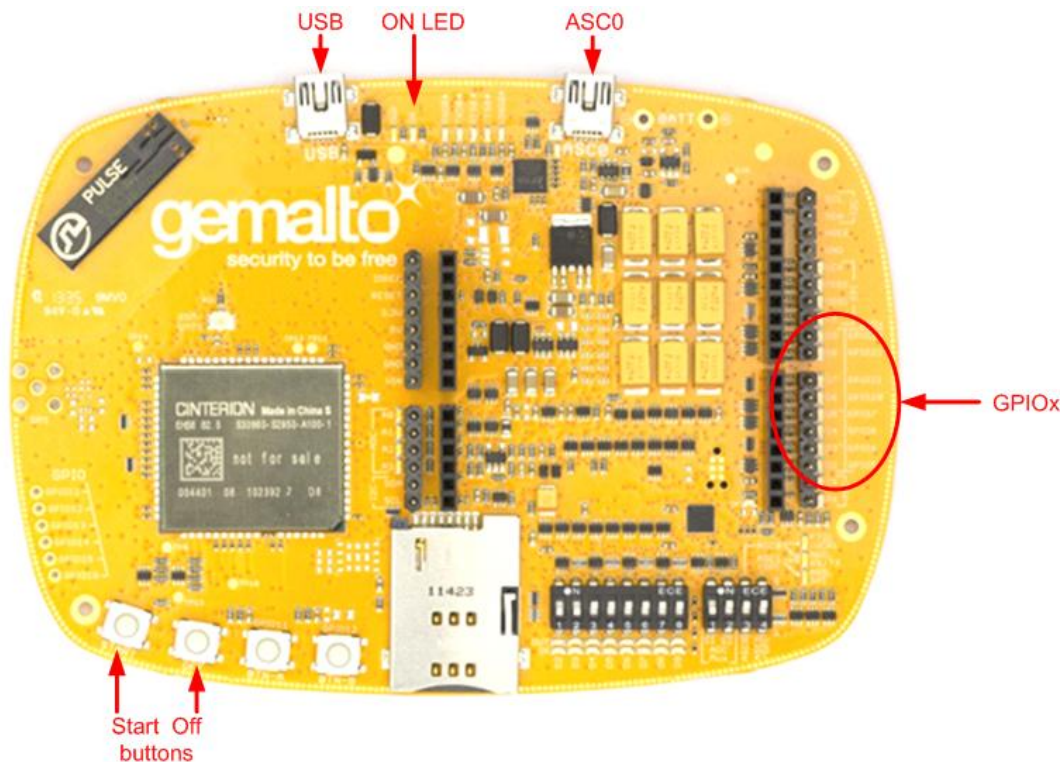
2   Connect the Concept Board to your PC

There are two alternative ways of connecting the Concept Board to your PC, either via the USB port or through the Virtual COM Port (VCP). Here we will focus on the USB port.

Through the USB interface of the Concept Board, you can access the EHS6 USB interface, which is a CDC-ACM Composite USB device supporting eight separate interfaces.

First of all, download the Concept Board install package from www.concept-board.com.

Then follow these steps:

- Connect the USB cable from the PC to the USB socket that is labeled `USB` on your Concept Board

- Start your Concept Board by pressing the `START` button.

- Extract the install package to a temporary folder and run "Setup.exe". Drivers will be automatically installed. If no IDE is present, you will be prompted to install Eclipse.

- Go to the Windows Device Manager to find out the COM port number of the newly installed modem device.

    Modems > "Cinterion EHSx Java Debug Modem USB" > Properties > Modem > Port

2.1   Connect the Concept Board via the Virtual COM Port (VCP)

The Concept Board has a built-in Serial-to-USB bridge (FTDI) which lets you use the serial interface (ASC0) of the EHS6 module via USB.

In order to use it follow the next steps:

- Connect the USB cable from the PC to the USB socket that is labeled `ASC0` on your Concept Board.

- If your operating system asks for drivers, visit FTDI's drivers page at

    http://www.ftdichip.com/Drivers/VCP.htm

    Download and install the VCP driver that fits to your system. **Note:** On Windows 7 and higher you do not need to install the driver because is delivered with the OS.

To start communicating with the Concept Board, first find out the right COM port number. For that, open the Windows Device Manager[1] and look for a device called *"USB Serial Port (COMxxx)"* in the *category "Ports (COM & LPT)"*. That *"xxx"* will be your COM port number.

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[1] Hint: You can open the device manager quickly by entering "devmgmt.msc" in the Windows Run dialog (⊞+R).

3 Communicate with the Concept Board

3.1 First steps

Open your favorite terminal program[2] and connect to the Concept Board with the following settings:

Table 1: COM port configuration

COM-Port[3]	<xxx> (your Port number)	Baud rate	115.200 bps
Data format	8N1 (8 data bits, 1 stop bit, no parity)	Flow control	Hardware (CTS/RTS control, DTR on)

Start the Concept Board by pressing the START button on the board.

You will see a couple of LEDs turning on. The green ON LED let's you know that the EHS6 module has started.

Send the ATI command to the Concept Board. The EHS6 module will answer[4] with its name and version number, like this:

```
> ATI
< Cinterion
< EHS6
< REVISION 02.000
< OK
```

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[2] Try, for instance, *hTerm*. This program is available for Windows and Linux at:
http://www.der-hammer.info/terminal/index.htm
Once installed, apply the following settings:
- Activate the "CTS Flow Control" checkbox
- In the "Rx" section, set "Newline at" to "CR+LF"
- In the "Input control" view, set "Send on enter" to "CR+LF", and activate the buttons "DTR" and "RTS" (hardware flow control)
- Save a config file, in order to reuse the settings in the next session

[3] Some of the settings may be called differently in different terminal programs.

[4] **Hint**: The module may be in a power saving mode, which may cause some delay before the module's answer arrives. During development time, it may be convenient to turn the auto-sleep mode off. Send the AT-command AT^SPOW=1,0,0 turns the sleep mode off.

3.2   Turn on the lights

The Concept Board has 8 *General Purpose Input / Output* (GPIO) signal lines connected to the Shield Interface (for the detailed pin-out of the Shield Interface please read [1]). The green LEDs next to the pin headers display what is happening on those lines.

Now we will configure the Concept Board GPIO lines to make the LEDs bright.

First, check that the GPIO-Switches are set to the `ON` position. The position of the switches can be seen in Figure 1, and the configuration in

Table **2**.
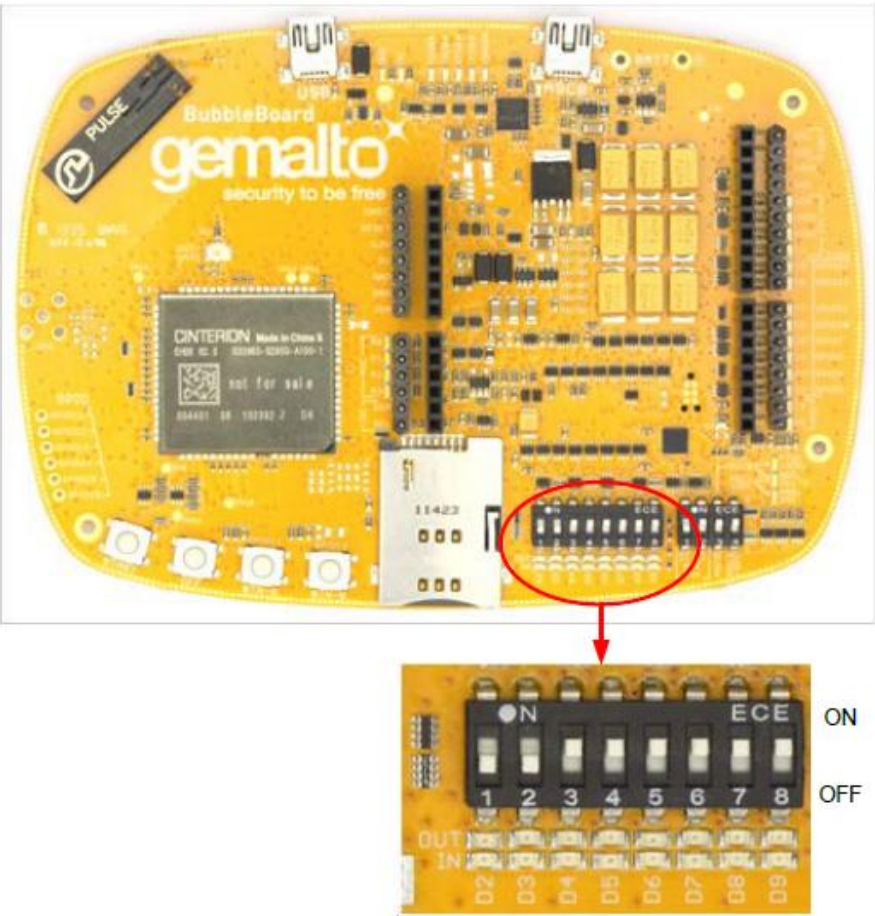
Figure 1: GPIO configuration switch bank

Table 2: GPIO configuration table

	Switch position							
	1	2	3	4	5	6	7	8
Shield I/F	D2	D3	D4	D5	D6	D7	D8	D9
EHS6 GPIO	GPIO5	GPIO6	GPIO8	GPIO7	GPIO20	GPIO21	GPIO22	GPIO23
ON	Output	Output	Output	Output	Output	Output	Output	Output
OFF	Input	Input	Input	Input	Input	Input	Input	Input

In your terminal program, send the following AT commands to the EHS6 module:

> `AT^SCPIN=1,4,1`   Configure the signal `GPIO5` to be an output.

> `AT^SSIO=4,1`   Set a HIGH signal on the `GPIO5` signal. The green LED next to the `GPIO5`-pin-header should turn on.

> `AT^SSIO=4,0`   Set a LOW signal on the `GPIO5` signal. The LED should turn dark.

> `AT^SCPIN=0,4`   Close the `GPIO5`. This releases the GPIO, and after that it can be re-configured

Note that the parameter "4" in these examples means the signal "5", when you start counting from zero. So to address *GPIOx*, the index *x-1* has to be used.

Following GPIOs are accessible on the Concept Board: GPIO5, 6, 7, 8, 20, 21, 22 and 23. They are labeled on the Board, along the alternative name (D2~D9) which follows the Arduino scheme.

Please go to the EHS6 AT Command Set [2] for further information on how to control the Concept Board via AT commands.

3.3   Dial a number

The Concept Board has a cellular modem embedded in the EHS6 module. Therefore, it is possible to make a phone call to your own mobile phone.

This is how to do it:
* Insert the SIM card into the Concept Boards' SIM card holder.
* If the Concept Board is not yet turned on, start it by pressing the `START` button and wait for the message ^SYSSTART.
* Enter the PIN code of your SIM card by entering the AT command > `AT+CPIN="<your pin>"`. The module replies with `OK` as it does when your input is correct and understood.
* Now the EHS6 module needs some time to connect to a mobile network. The `AT+COPS?` command provides information about the network status. The result `+COPS: 2` means that the module is not registered in a mobile network yet. A result like `+COPS: 0,0,"My MNO",2` tells you that the module has registered with the My MNO network.
* Dial the number of your Concept Boards' SIM card from your mobile phone.
* In the terminal program you should frequently see the message `< RING` showing up, while on the Concept Board, the red `RING0` LED blinks.
* See who is calling by entering > `AT+CLCC`. The answer looks like this: `< +CLCC: 1,1,4,0,0,"<your number>",145` where `<your number>` is the number of the caller.
* You can pick up the phone with the command `ATA`, and hang up with the command `ATH`.
* You can also call your mobile phone with the command `ATD<your_number>;`, without any whitespaces.

3.4   Turn off the Concept Board

There are three ways to turn off the Concept Board:
* Turn off the module, which also turns off the Concept Board: > `AT^SMSO`
* Turn of the Concept Board by pressing the `OFF` button
* Unplug the USB cable

4   What to do next

Start programming your first Concept Board Java™ application.

The Eclipse and NetBeans Integrated Development Environments (IDE) are distributed as a part of the install package (CMTK). If no IDE is present, you will be prompted to install Eclipse during the package installation.

If not done already, download the install package from www.concept-board.com, extract to a temporary folder, and run "Setup.exe".

Note: For detailed information on the installation procedure, please take a look at the Java User's Guide in the folder "\program files\Cinterion\CMTK\EHS5\Documentation" inside the provided .zip file.

Start by using the examples and documentation provided in the install package. Read the Java User's Guide and Java-docs for details about the Java API.

Concept Board documentation and installation files
www.concept-board.com

Gemalto M2M developer zone (forum, examples and much more)
http://developer.gemalto.com

5   Related Documents

[1]   Concept Board Hardware Interface Description, v01b
[2]   EHS6 AT Command Set, v02.000a

To visit the Gemalto M2M Website you can use the following link:
http://m2m.gemalto.com/

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