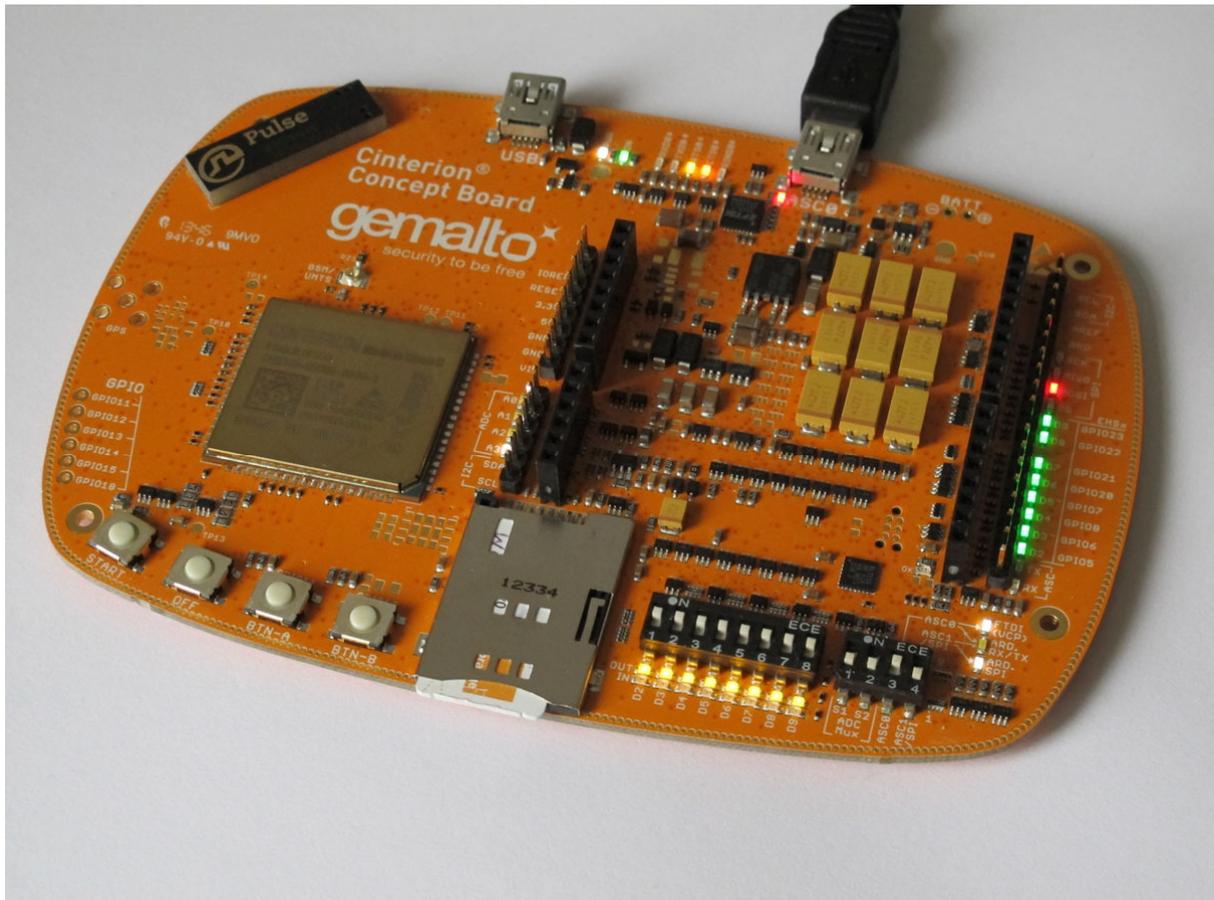


Gemalto (Cinterion) EHS6 Concept Board

Getting Started Guide



The Gemalto (Cinterion) EHS6 Concept Board is a valuable tool for both embedded hardware designers and software developers wishing to explore the potential of adding 3G cellular connectivity to systems.

Introduction

The Gemalto (Cinterion) EHS6 Concept Board is a great platform for evaluation and development of systems utilising 3G cellular communications.

With the Shield Interface all kinds of Arduino-style sensor boards can be attached and a system created with extensive hardware experience.

The on-board EHS6 Java module with global 2G and 3G cellular connectivity can be used to host an application to complete a prototype or demonstration system. A software development kit based upon widely used tools such as Eclipse or NetBeans is available for creating and installing embedded Java applications.

Key Features

Module & Frequency Bands	Cinterion EHS6 penta-band 3G (UMTS) + quad-band 2G (GPRS) UMTS/HSPA+: 800/850/900/1900/2100MHz GSM/GPRS/EDGE: 850/900/1800/1900MHz
SIM Cards / Interface	Mini SIM Card (standard GSM / 2FF): 3.0V, 1.8V
Antenna interface	Penta-band GSM/UMTS RF antenna on-board
Power Supply	Via USB interface Supports Li+ battery pack through 2-pin connector
Serial Interface	ASC0 via Virtual COM Port (VCP) Maximum baud rate 921kbps
USB Interface	Yes, EHS6 Windows Drivers also available.
User Buttons	- START - OFF - User button BTN-A - User button BTN-B
LEDS	Current configuration is displayed via on board LEDs.
Configuration	Two switch banks allow manual configuration of GPIO signal direction, ATC multiplexing and SPI/ASC sharing
External Interfacing	Shield Interface 8 GPIO lines with level shifters, 4 ADC inputs Access to all serial interfaces of EHS6 module

This document aims to provide an understanding of

- 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
- Introduction to further work and Java Programming

Concept Board Interfaces

Diagram 1 below indicates the location of each of the Concept Boards interfaces.

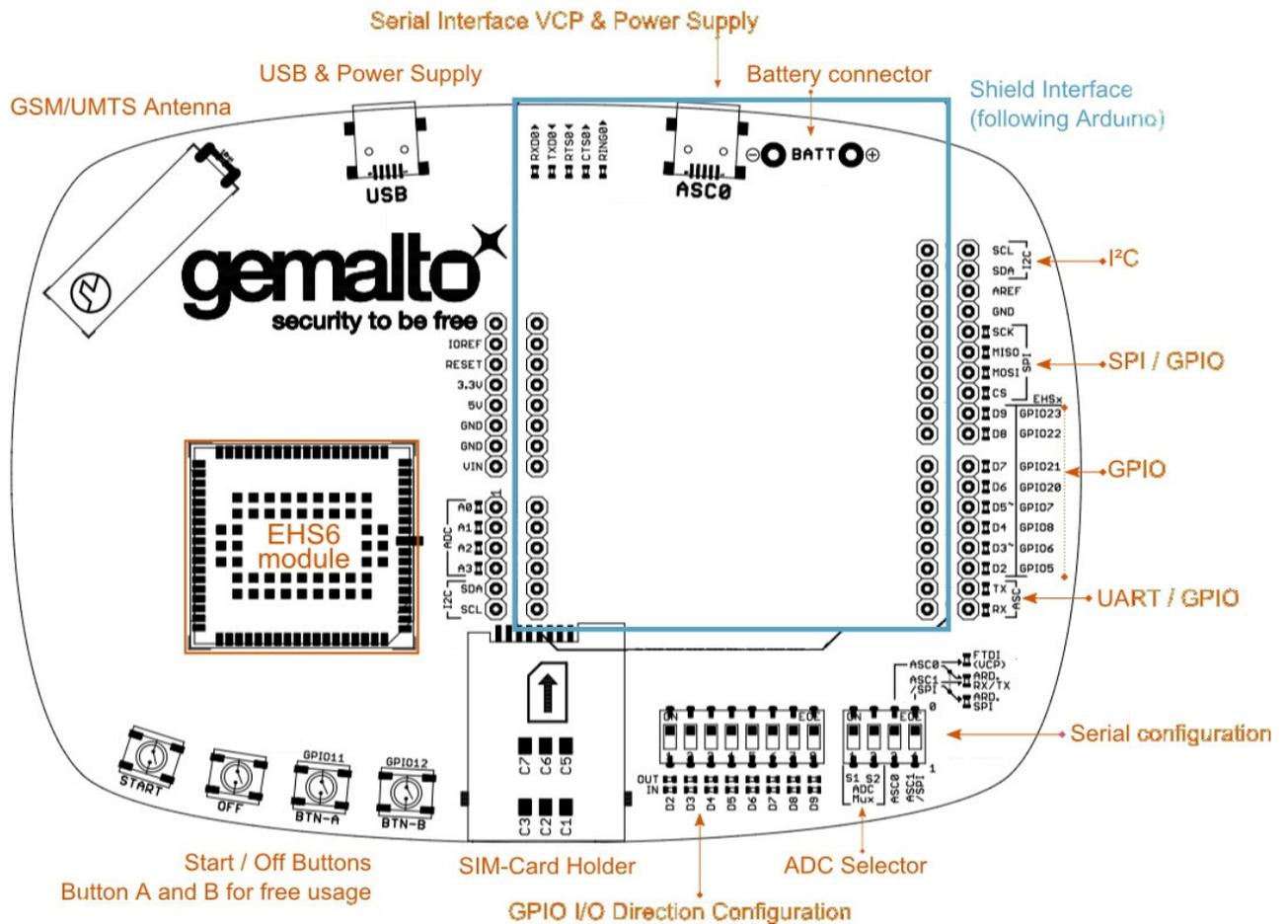


Diagram 1 – Concept Board Interfaces

Connecting the Concept Board to your PC.

The concept board can be powered from the PC via the USB cable, this is the easiest way to power the board, and the same cable can be used for communications between the PC and Concept Board. The communication link can be created by one of two ways - either via the USB port or through a Virtual COM Port (VCP).

The following steps detail how to establish communications between a PC and Concept Board for either method.

Method A – Virtual COM port (over USB)	Method B – USB
<p>The Concept Board has a built-in Serial-to-USB converter connected to the serial interface (ASCO) of the EHS6 module.</p>	<p>The EHS6 is accessed via the USB interface of the Concept Board. This is a CDC-ACM Composite USB device supporting eight separate interfaces.</p>
<p>1. Connect the supplied USB cable from the PC to the USB socket labelled 'ASCO' on the Concept Board.</p> <p>If the PC / operating system asks for drivers, these can be found on the FTDI drivers page at http://www.ftdichip.com/Drivers/VCP.htm</p> <p>Download and install the VCP driver that fits to your operating system. Note: On Windows 7 and higher you do not need to install the driver because is delivered with the OS.</p> <p>2. Open Windows Device Manager and look for a device called "USB Serial Port (COMxxx)" in the category "Ports (COM & LPT)". The number "xxx" indicated which virtual COM port number the device is allocated too. Configure your Terminal Emulator program to use this COM port number.</p>	<p>1. Connect the supplied USB cable from the PC to the USB socket on the Concept Board</p> <p>2. Start your Concept Board by pressing the START button.</p> <p>3. Install the USB drivers (found in the .zip file provided ehs6_drivers_1112.zip).</p> <p>Note: The drivers need to be installed manually. On Windows XP and Vista through the "Found new hardware wizard"; on Windows 7 right-click in the Windows Device Manager and choose "Update Driver Software..."</p> <p>4. Go to the Windows Device Manager to find out the COM port number of the newly installed modem dev Modems > "Cinterion EHSx Java Debug Modem USB" > Properties > Modem > Port</p>

Initial Steps

To start communicating with the Concept Board, configure a terminal emulator with the following communication settings

COM Port	Port Number as above
Data Rate:	115,200 Bit per second
Data bits:	8 bits
Parity:	None
Stop Bits:	1
Flow Control:	Hardware

Start the Concept board by pressing the START button you should see some of the LED lights turning on and the initial start-up string from the EHS6 Module on the Terminal Emulator program.

Turning on the LEDs / GPIOs

On the Concept Board, 8 of the EHS6 modules' General Purpose Input / Output (GPIO) signals are allocated to the Shield Interface (for further details and pin-out of the Shield Interface see below).

The GPIO Direction Configuration Switch (See Diagram 1) configures the direction of the GPIO signals and a green LED next to the GPIO Pin header indicates what is happening on each line.

First, check that the GPIO-Direction Switches are set to the ON position (towards the centre of the board) which configures the GPIO line as an output.

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

<code>AT^SCPIN=1,4,1</code>	Configures the EHS6 signal GPIO5 to be an output.
<code>AT^SSIO=4,1</code>	Set a HIGH state on the GPIO5 signal. The green LED next to the GPIO5-pin-header should turn on.
<code>AT^SSIO=4,0</code>	Set a LOW state on the GPIO5 signal. The LED should turn off.
<code>AT^SCPIN=0,4</code>	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. To address any number GPIOx, the index x-1 has to be used.

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

Switch Number (ON=output)	1	2	3	4	5	6	7	8
Shield Interface pin	D2	D3	D4	D5	D6	D7	D8	D9
EHS6 GPIO	GPIO5	GPIO6	GPIO8	GPIO7	GPIO20	GPIO21	GPIO22	GPIO23

Dialling a phone number

The EHS6 3G cellular module on the Concept Board makes it possible to make and receive calls from another telephone. A valid SIM card is required for a cellular network accessible in your location.

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.

If required 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** indicates 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 RINGO 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 answer the call with the command **ATA** command, and hang up with the command **ATH**.

You can also call your mobile phone with the command **ATD<your_number>;**

Note the ";" at the end and that no spaces are in the command line.

Further work

The **EHS6 AT Commands** document contains further information for these and other AT Commands.

This and other documentation can be found on the Gemalto Developer Zone referenced below.

Data Communications: On the Gemalto developer zone [1] a series of tutorials provides an introduction to using the *Internet Services* and implementations with some of these.

[Concept Board: Internet Services - basics](#)

[Concept Board: Internet Services - HTTP](#)

[Concept Board: Internet Services - Transparent Socket](#)

JAVA

It is not necessary to use Java with the Concept Board. A Java SDK is available for users to write and deploy their own high-level application software making use of the extensive capabilities of the EHS6 module and interfaces.

Further information can be found in the Java Users Guide, available on the Gemalto Developer Zone.

Visit the **Gemalto Developer Zone** for further information <https://developer.gemalto.com/>