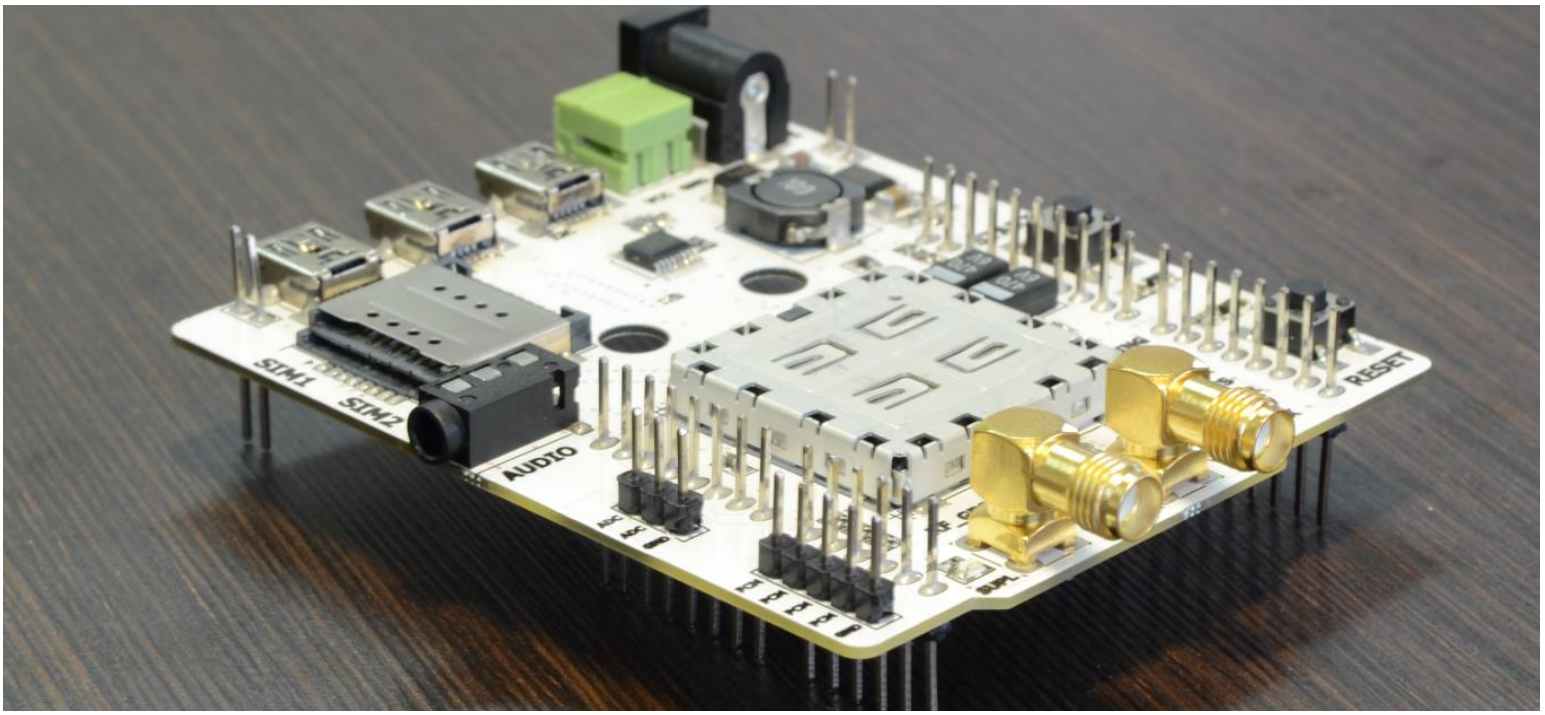


Development Kit HL Light Arduino - HL Light board.

1. Overview
1.1. Embedded Module Support
1.2. Component Placement
2. Configurations and Settings
2.1. Development Kit
3. Getting Started with the HL Light Development Kit
3.1. Setting Up the Development Kit
3.2. Switching the Development Kit On
3.3. Communicating with the Embedded Module
3.3.1. Configure the COM Port
4. Code examples

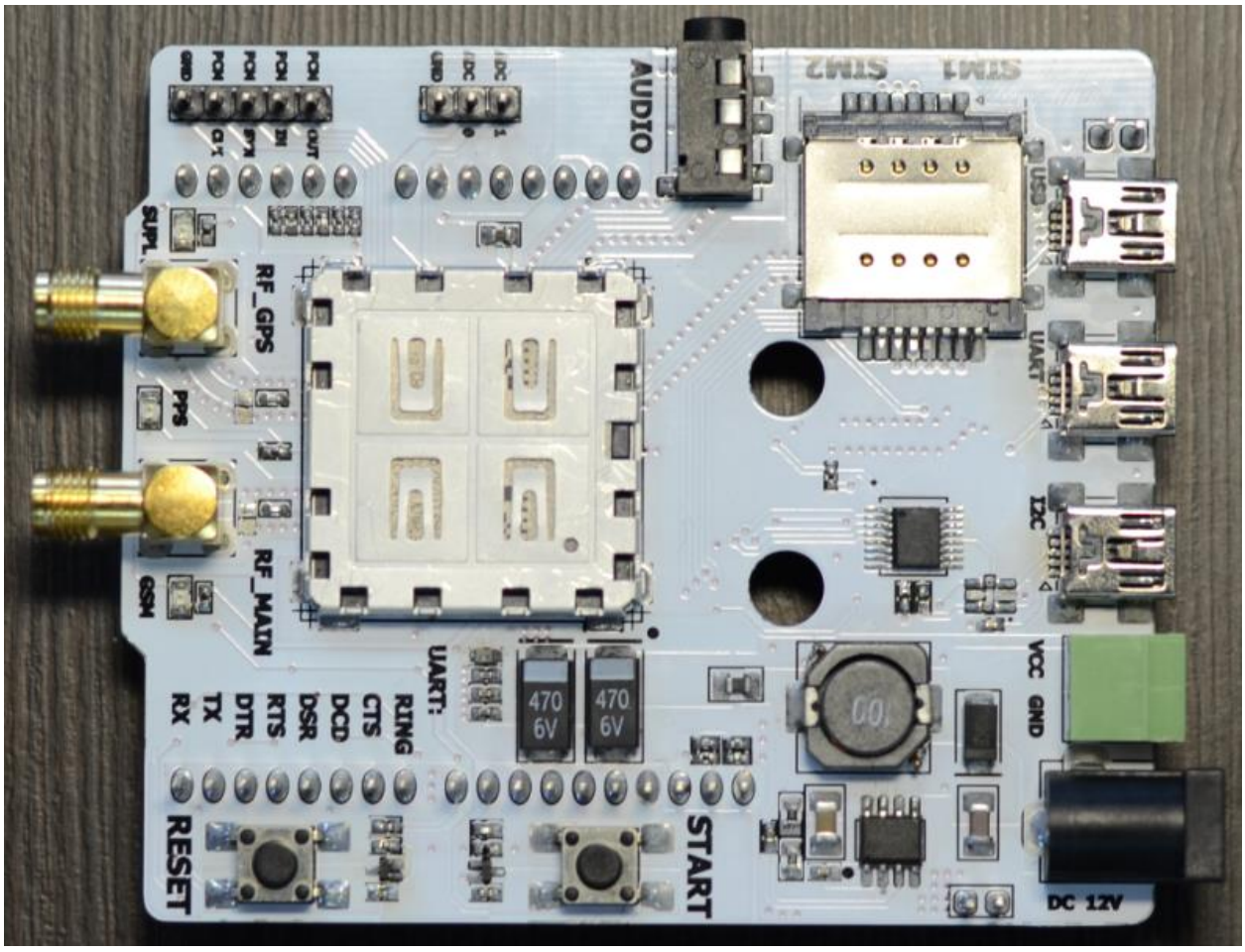
4.1.1 How to switch SIM Cards (this case use for HL6528x)

4.1.2How to Use TCP Commands

4.1.2.1 Client Mode
4.1.3 How to Use SIM Toolkit
4.1.4 How to Switch from Data Mode to Command Mode

1. Overview

This document describes the AirPrime HL Light Development Kit and how it integrates with the AirPrime HL6528x/HL8548x/HL7xxx series of embedded modules via a socket.



1.1. Embedded Module Support

Although the AirPrime HL6528x has four variants as enumerated in the following table, the current version of the Development Kit only supports non-GPS variants (HL6528 and HL6528-2.8V).

Table 1. HL6528x Embedded Module Variants

Variant Name	Part Number	Description
HL6528		HL6528, GENERIC 1.8V
HL6528-G		HL6528-G, GENERIC 1.8V
HL6528-2.8V		HL6528-2.8V, GENERIC 2.8V
HL6528-G2.8V		HL6528-G2.8V, GENERIC 2.8V
HL6528 RD		HL6528, GENERIC 1.8V
HL6528-G RD		HL6528-G, GENERIC 1.8V
HL6528-2.8V RD		HL6528-2.8V, GENERIC 2.8V
HL6528-G2.8V RD		HL6528-G2.8V, GENERIC 2.8V

Table 2. HL8548x Embedded Module Variants

Variant Name	Part Number	Description
HL8548		HL6528, GENERIC 1.8V
HL8548-G		HL6528-G, GENERIC 1.8V

1.2. Component Placement

Refer to the following figure for the component placement on the AirPrime HL6528x/HL8548 Development Kit.

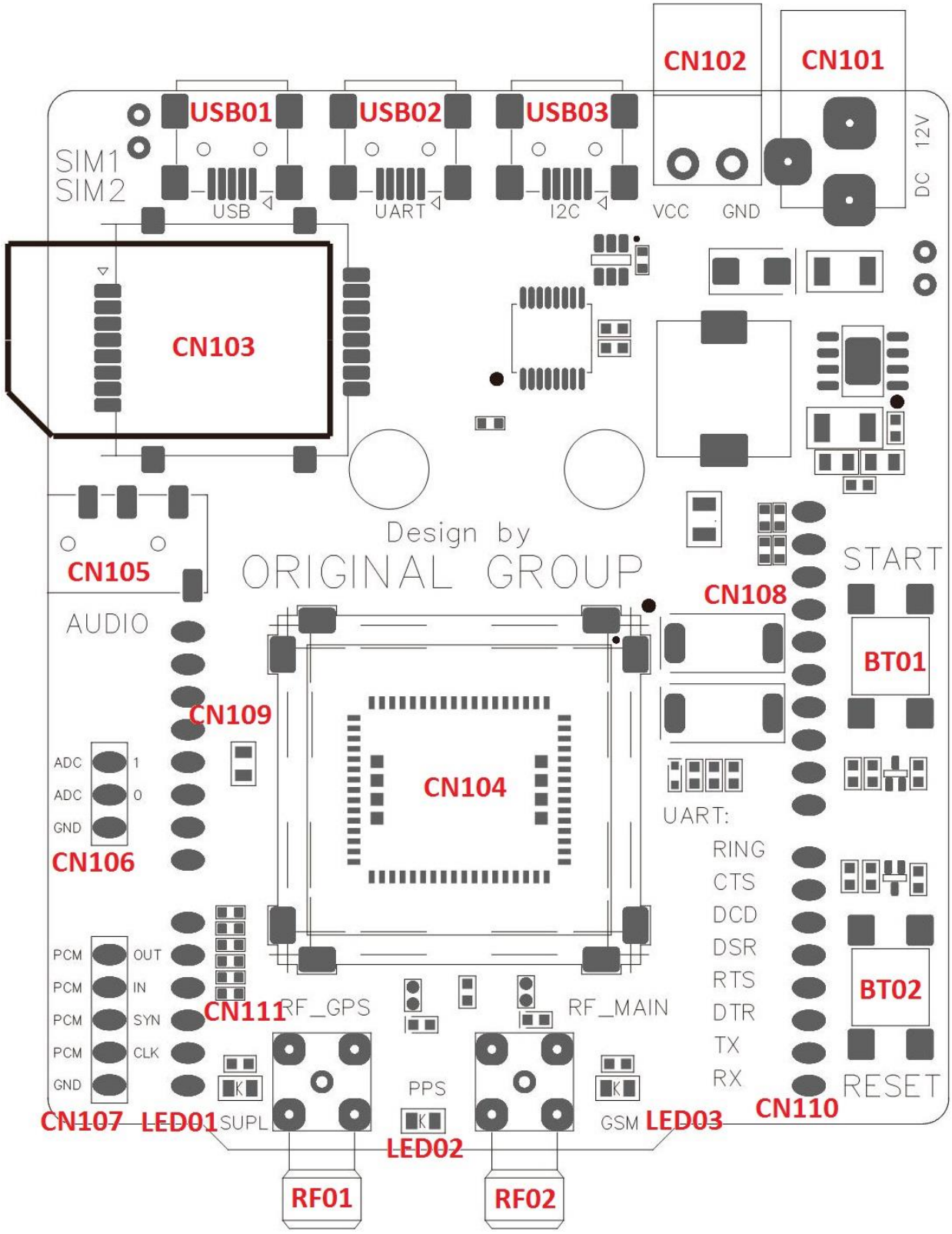


Figure 2. Development Kit Component Placement

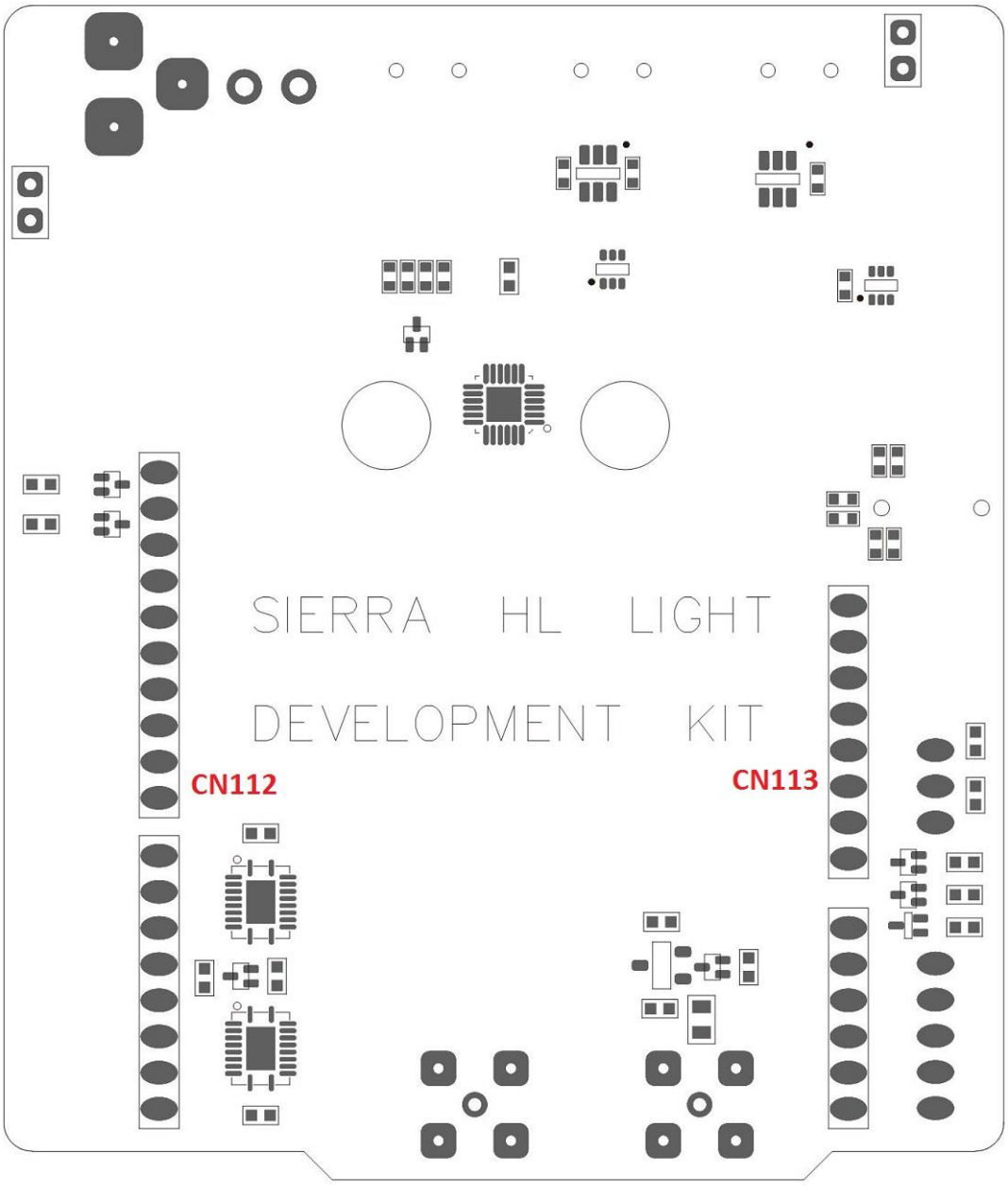


Figure 3. Development Kit Component Placement

Table 3. Features Available on the Development Kit

Features	Connector / Switch	Description/Configuration
Power jack	CN101	12V-50V, 1.2A
Positive/Negative lab power supply (+/-)	CN102	12V – 50V, 1.2A
USB(UART1)	USB02	Main UART
USB(UART2 debug)	USB01	SW spytracer

USB (I2C)	USB03	GNSS NMEA
UART pins	CN110	Pins for connect to Nucleo board
Start	BT01	Button Start
Reset	BT02	Button Reset
Analog audio	CN105	
Digital audio (PCM)	CN107	
ADC0, ADC1	CN106	Pin 1 is ADC0 input, 0-3V Pin 3 is ADC1 input, 0-3V
UIM1	CN103	SIM1
UIM2		SIM2
LED Power On	LED01	
LED PPS	LED02	
SMA GSM	RF01	
SMA GNSS	RF02	
HL Socket-in	CN104	
Connectors Nucleo Board	CN108,CN109,CN110,CN111,CN112,CN113	

2. Configurations and Settings

The AirPrime HL Series Development Kit board automatically adapts to either 2.8V or 1.8V HL6528x HL6528xRD,HL8548x, HL75xx

3. Getting Started with the HL Light Development Kit

This section describes how the AirPrime HL Light Development Kit is set up as well as describes communications testing, making calls and debugging with an embedded module.

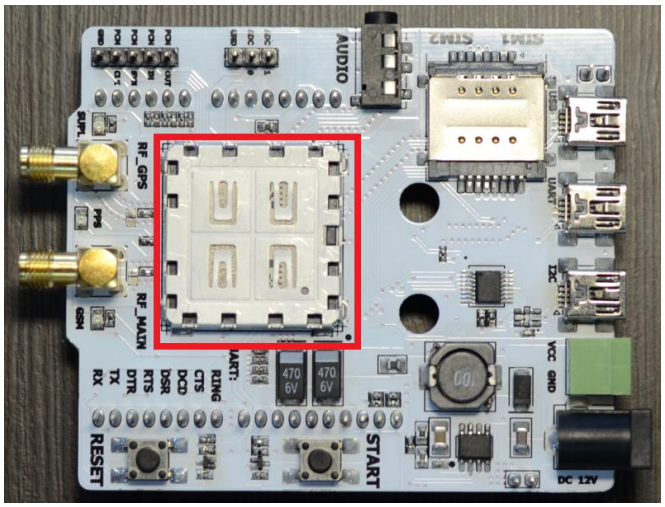
3.1. Setting Up the Development Kit

Perform the following steps before powering the Development Kit on.

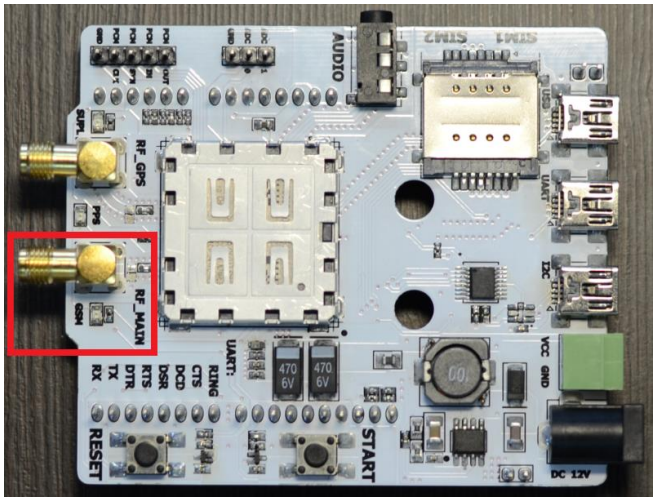
1. Ensure that switches and connectors are configured accordingly. By default, the development kit board is configured from the factory before shipment. Refer to Table 3 Jumper and Switch List for some of the board's default settings.

2. Put embedded module HL6528x or HL8548x to Socket-In CN104

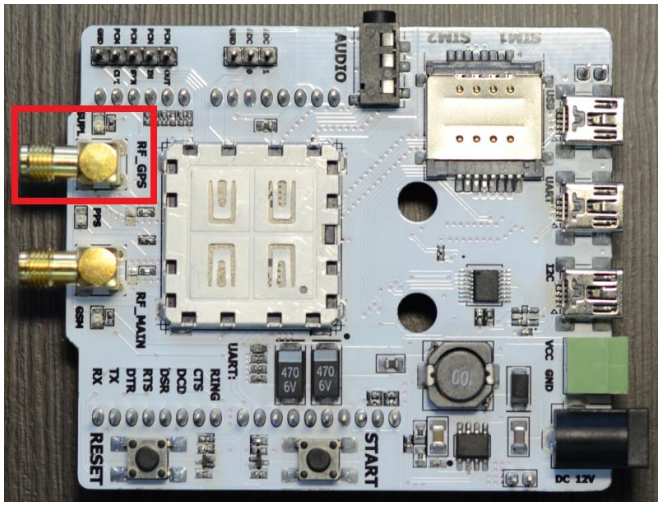
.



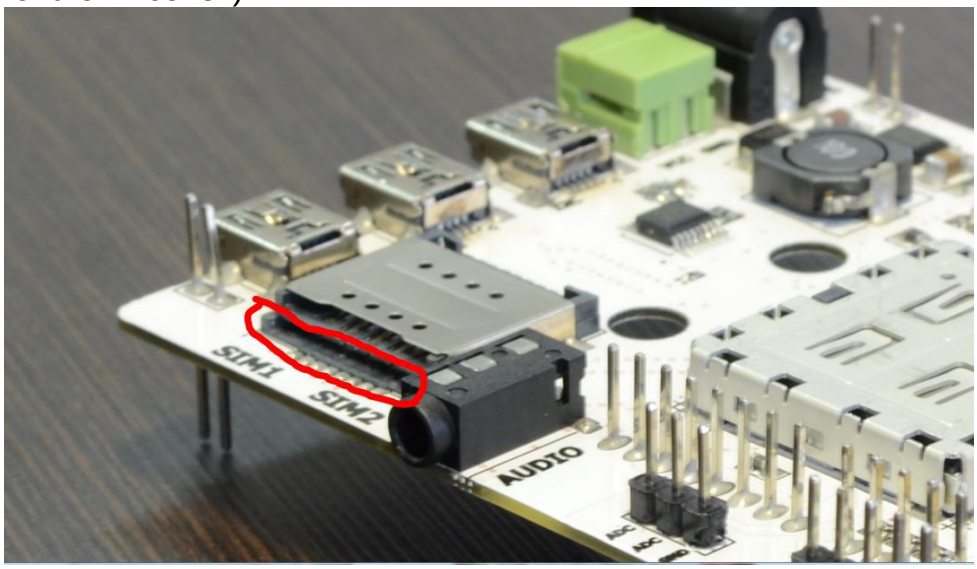
3. Connect a GSM antenna to RF02 of the board.



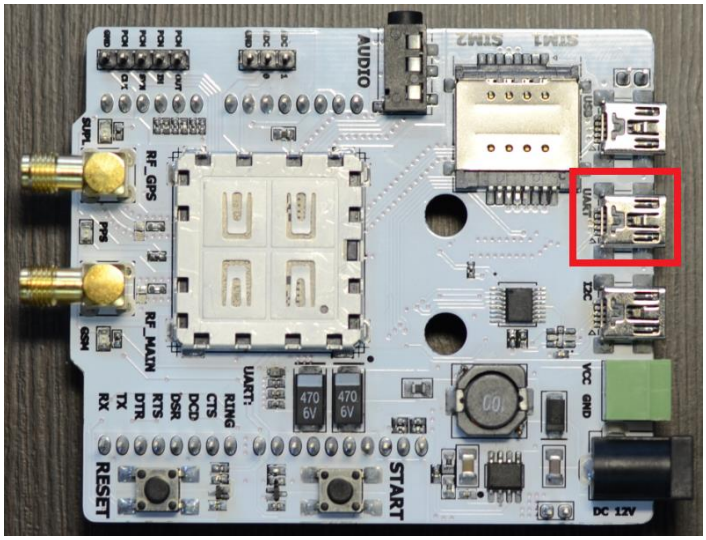
and GNSS antenna RF01



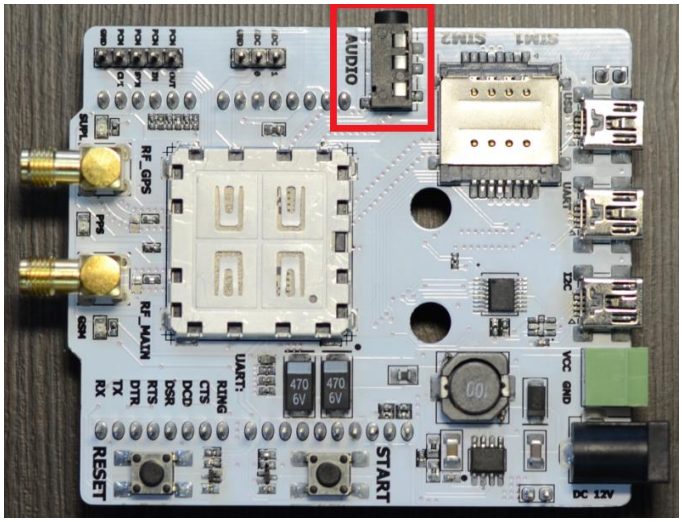
4. Insert a SIM card in the bottom slot in SIM-holder CN103 (SIM2 is optional for the HL6528x).



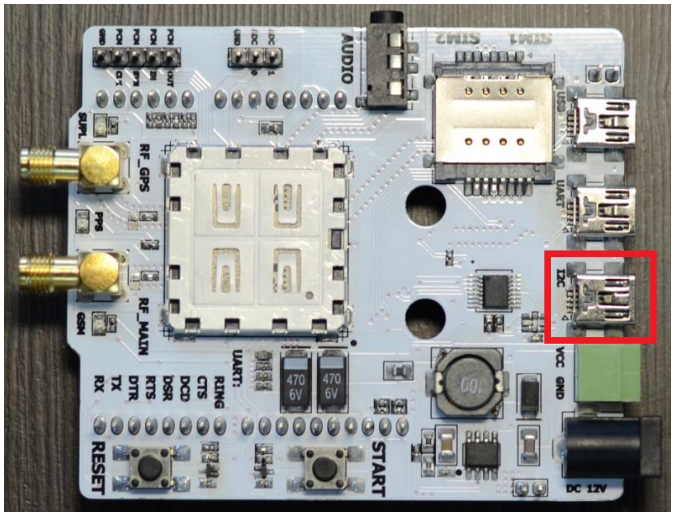
6. Connect an USB cable to USB02 for USB and connect to PC.



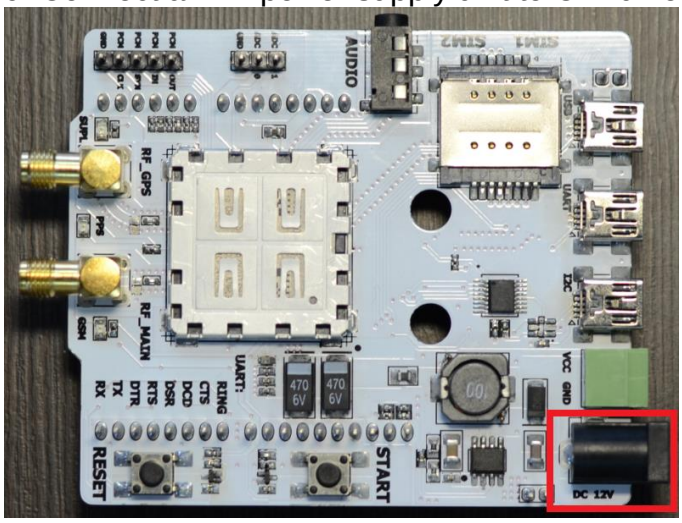
7. Connect a handset to CN105 for audio communications.



8. Connect a USB cable to USB USB03 to get NMEA output.



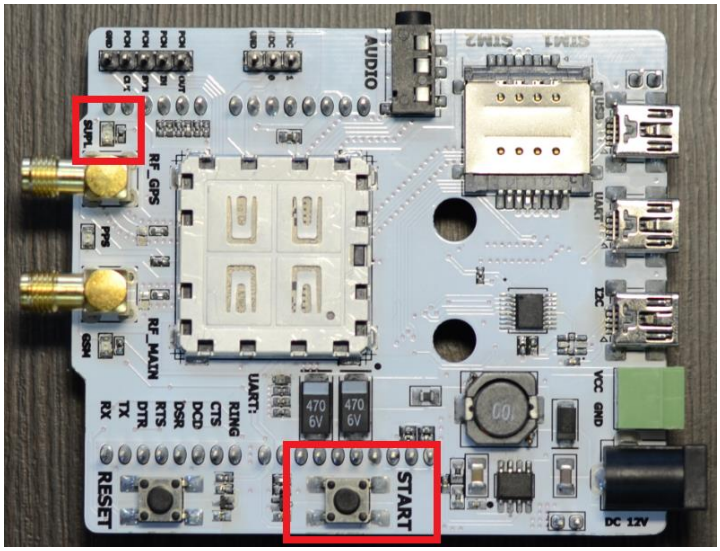
9. Connect a 12V power supply unit to CN101 or CN102



The AirPrime HL Series Development Kit should look like the following figure after it has been properly set up.

3.2. Switching the Development Kit On

The Development Kit will automatically be powered on when will be connect a 12V power supply unit to CN101. For start modem push Button Start BT01 for approximately 3 seconds.



Green LED LED01 are lit when the Development Kit has been properly powered on.

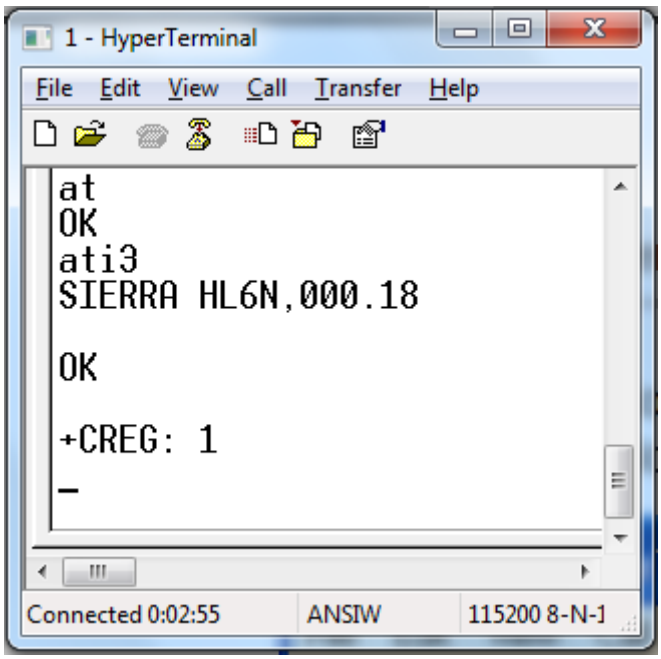
3.3. Communicating with the Embedded Module

3.3.1. Configure the COM Port

Configure the COM port settings by selecting the port which is connected to the Development Kit and specifying the following port settings.

- Bits per second 115200
- Data bits 8
- Parity None
- Stop bits 1
- Flow control None

Test communications using a PC terminal emulator (for example, HyperTerminal) by entering **AT**. The module should answer with **OK**.

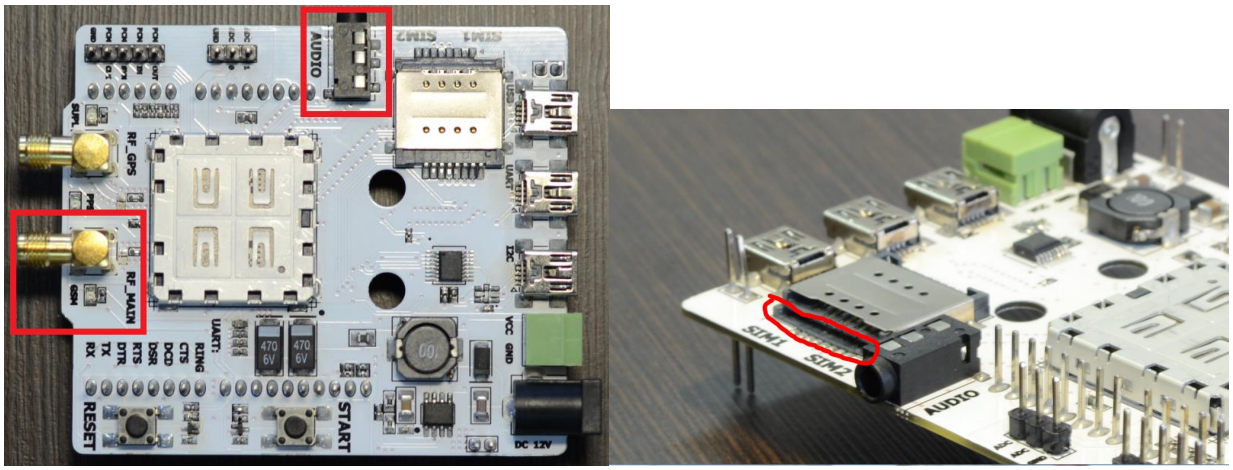


3.3.2. Make a Voice Call

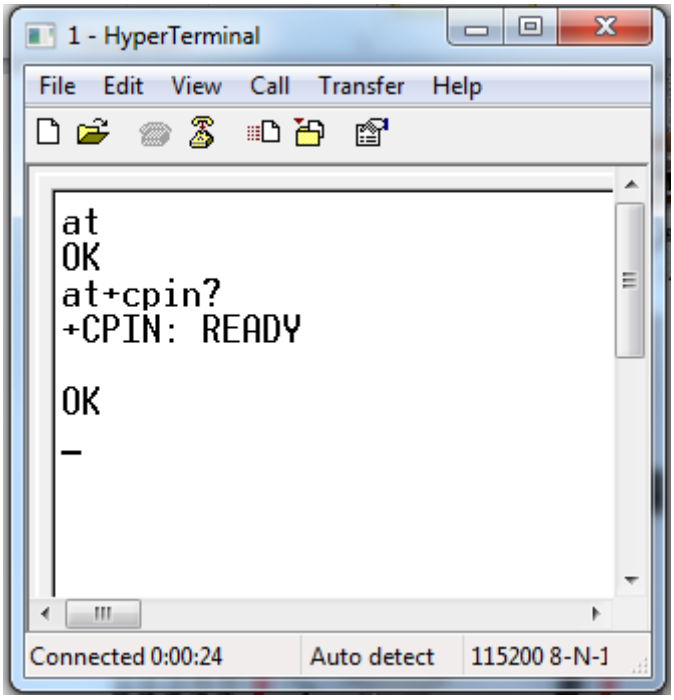
To make a voice call with the Development Kit, follow these steps.

1. Ensure that:

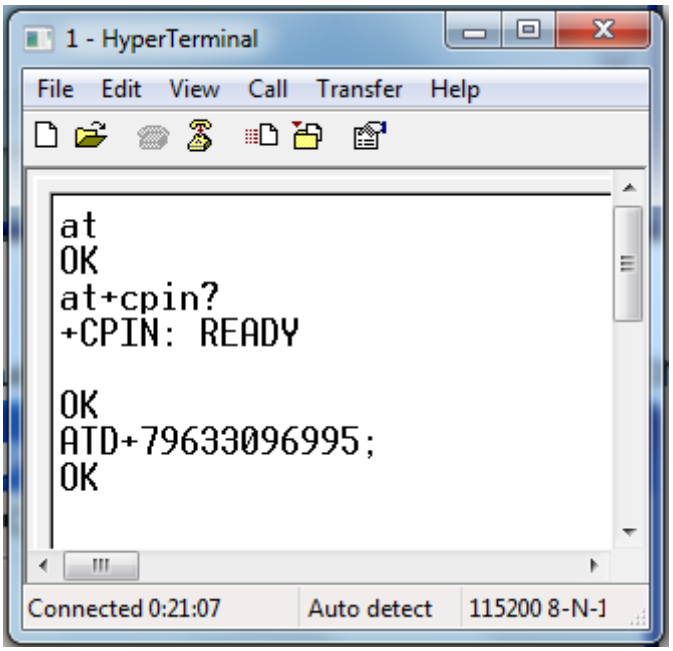
- a SIM card is inserted in SIM1 (CN103),
- a GSM antenna is connected to RF02 on the socket board,
- a handset is connected to CN105



2. From a PC terminal emulator (for example, HyperTerminal), input **AT+CPIN?**. If the SIM card is ready, the module will respond with **+CPIN: READY**, otherwise it will return **ERROR**.



3. Enter **ATD<phone number>;** to make a call. For example, enter **ATD+79633096995;**.



4. Code examples

4.1.1 How to switch SIM Cards (this case use for HL6528x)

AT+CPIN?	**interrogation of default SIM PIN status**
+CPIN: READY	
OK	
AT+KSS	**the next AT command will be directed to non-default SIM**
OK	
AT+CPIN?	**interrogation of non default SIM PIN status**
+CPINDS: SIM PIN	**DS is concatenated to CPIN, need PIN code for non default SIM**
OK	
AT+KSS	**the next AT command will be directed to non-default SIM**
OK	
AT+CPIN="0000“	**PIN code will be directed to non default SIM**
OK	
AT+KSS	**the next AT command will be directed to non-default SIM**
OK	
AT+CPIN?	**interrogation of non default SIM PIN status**
+CPINDS: READY	**DS is concatenated to CPIN, the non default SIM is OK**
OK	

4.1.2How to Use TCP Commands

4.1.2.1 Client Mode

AT&K3	**Hardware flow control activation**
OK	
AT+KCNXCFG=0,"GPRS","APN","log","password","0.0.0.0","0.0.0.0","0.0.0.0"	**Set GPRS parameters (APN, login, password…)**
OK	
AT+KTCPCFG=0,0,"www.google.com",80 +KTCPCFG: 1	**Set IP address and port number**
OK	
AT+KTCPCNX=1	

OK	**Initiate the connection**
AT+KTCPSND=1,18 CONNECT …Data send… OK	**Send data with KPATTERN string at the end. e.g. "GET / HTTP/1.0** **--EOF--Pattern--"**
+KTCP_DATA: 1,1380 **AT+KTCPRCV=1**, 1380 CONNECT HTTP/1.0 200 OK Cache-Control: private, max-age=0 … a lot of data… --EOF--Pattern-- OK	**DATA read**
+KTCP_DATA: 1,1380 **AT+KTCPRCV=1,1380** CONNECT er{padding-bottom:7px !important}#gbar,#guser{font- … a lot of data… --EOF--Pattern-- OK	**+KTCP_DATA notification** **DATA read**
+KTCP_DATA: 1,1380 **AT+KTCPCLOSE=1,1** OK **AT+KTCPDEL=1** OK **AT+KTCPCFG?** OK	**Close session 1** **Delete session 1** **No session is available**

4.1.3 How to Use SIM Toolkit

AT+CPIN="1234" OK *PSSTK:"SETUP MENU",1,4,"SIMMAX",0,0,1,0,0,6 message	Enter PIN CODE Soon the module sends an unsolicited message *PSSTK:"SETUP MENU" , it is the STK Setup menu There are 6 items in STK menu.
AT*PSSTK="SETUP MENU",1,0 OK *PSSTK: "END SESSION"	Give response to URC "SETUP MENU". "1" is the Command Number. URC for Session Status : End of STK Session
AT*PSSTK="GET ITEM LIST",6	Use "GET ITEM LIST" command to get the list of items Item 1: "Switch number". Item 2: "Utilities" Item 3: "Auto Switch" Item 4: "Hidden Phone Book" Item 5: "IP Call" Item 6: "Product Info"
*PSSTK: "GET ITEM LIST",1,16,4,"Switch Number",0,0,0 *PSSTK: "GET ITEM LIST",2,17,4,"Utilities",0,0,0 *PSSTK: "GET ITEM LIST",3,18,4,"Auto Switch",0,0,0 *PSSTK: "GET ITEM LIST",4,19,4,"Hidden Phone Book",0,0,0 *PSSTK: "GET ITEM LIST",5,20,4,"IP Call",0,0,0 *PSSTK: "GET ITEM LIST",6,22,4,"Product Info.",0,0,0 OK	
AT*PSSTK="MENU SELECTION",22	Select menu 6, whose ItemIdentifier is 22. After this operation, it will enter into submenu of menu item 6.
OK *PSSTK: "SELECT ITEM",0,0,"",0,0,1,0,0,2 AT*PSSTK="GET ITEM LIST",2 *PSSTK: "GET ITEM LIST",1,1,4,"Customer service",0,0,0 *PSSTK: "GET ITEM LIST",2,2,4,"LOT",0,0,0	Totally 2 menus in this level Item 1 is "Customer service", no more sub menus Item 2 is "LOT", no more sub menus
OK AT*PSSTK="SELECT ITEM",1,1,0,0 OK	Select item 1 "Customer service", whose ItemIdentifier is 1 URC "DISPLAY TEXT" info will be shown with customer information, "http://www.sim-max.com/"
*PSSTK: "DISPLAY TEXT",1,0,1,0,4,"http://www.simmax.com/",0,0	You have to use "DISPLAY TEXT" command to give a response to STK URC for session status
AT*PSSTK="DISPLAY TEXT",1,0 OK *PSSTK: "END SESSION"	

4.1.4 How to Switch from Data Mode to Command Mode

AT+CPIN=”0000”	**Enter PIN CODE**
OK	
AT+CGDCONT=1,"IP","APN","0.0.0.0",0,0	**Configure the GPRS parameters**
OK	
ATD*99*1#**	**Dial up to have a data connection**
CONNECT	
~ÿ}#À!}!} } }2}!}$}%Ü}"}&} }*} } }#}$À#kZ~~ÿ}#À!}!}!} }2}!}$}%Ü}"}&} }*} } }#}$À#dJ~~ÿ}#À!}!}"} }2}!}$}%Ü}"}&} }*} } }#}$À#uz~	**DATA exchanges (PPP)**

OK	**Send “+++” characters**
AT	**Switch to command mode is done**
OK	**It is possible to use AT commands**
ATO	**Switch to data mode, resume the data connection**
CONNECT	
~ÿ}#À!}!}#} }2}!}$}%Ü}"}&} }*} } }#}$À#zj~~ÿ}#À!}!}$} }2}!}$}%Ü}"}&} }*} } }#}$À#W}:~~ÿ}#À!}!}%} }2}!}$}%Ü}"}&} }*} } }#}$À#X}*~~ÿ}#À!}!}&} }2}!}$}%Ü}"}&} }*} } }#}$À#I:~~ÿ}#À!}!}'} }2}!}$}%Ü}"}&} }*} } }#}$À#F*~~ÿ}#À!}!}(} }2}!}$}%Ü}"}&} }*} } }#}$À#}3Ú~~ÿ}#À!}!)} }2}!}$}%Ü}"}&} }*} } }#}$À#}<Ê~~ÿ}#À!}!}*} }2}!}$}%Ü}"}&} }*} } }#}$À#}-ú~	**DATA exchanges continue**
NO CARRIER	**End of connection**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