ZigBee Lab

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Outline

- ZigBee tools
  - IAR
  - SmartRF
- ZigBee boards
  - Evaluation Board (EB)
  - Development Board (DB)
- Example and exercise

ZigBee tools

- **IAR (I**ngenjörsfirman **A**nders **R**undgren**)**: is embedded systems workbench IDE for building and running applications on zigbee boards. www.iar.com
- **SmartRF**™ Studio: is a Windows application that can be used to evaluate and configure Low Power RF-ICs from Texas Instruments.

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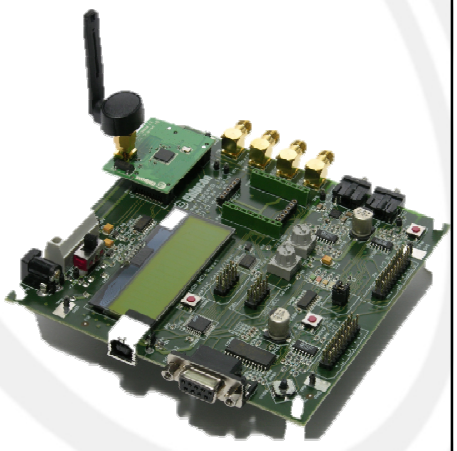
ZigBee board #1

- **Chipcon SmartRF04EB**

  Evaluation Board with CC2430EM (RF)



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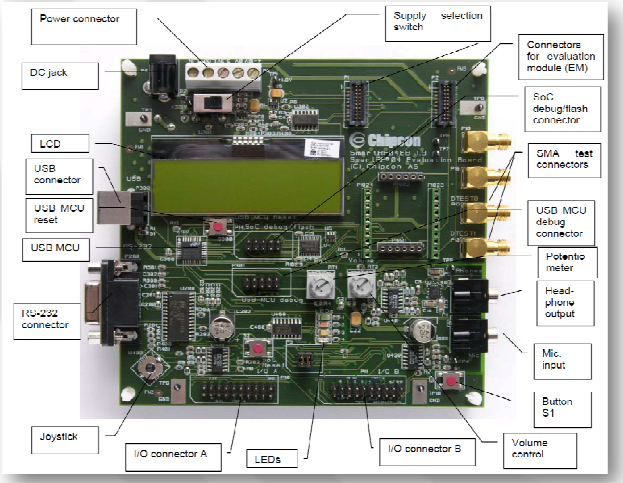
ZigBee board #1



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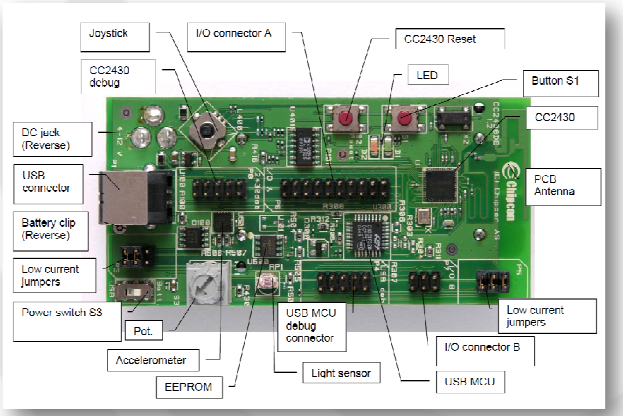
ZigBee board #2

- **Chipcon CC2430DB Development Board**



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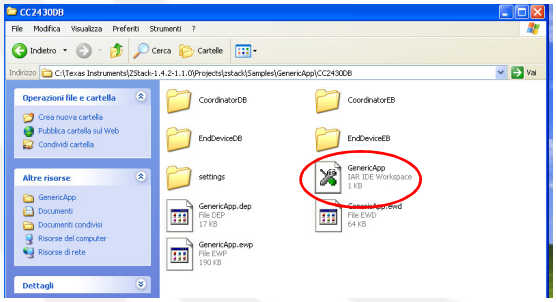
Generic App (1)

- Open GenericApp example(Zstack & IRA tools) from example folder as shown bellow:
  - C:\texasInstrument\Zstack-1.4.2.1.1.0\project\Zstack\samples\GenericApp\CC2430DB\GenericApp



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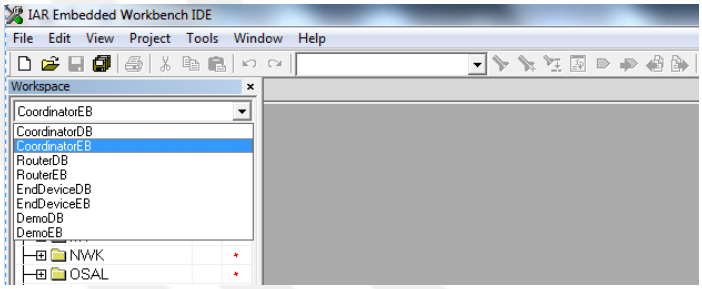
Generic App (2)

- Choose Coordinator or End device based on your board type (ED, DB) and ZigBee role (ZC,ZR,ZED)



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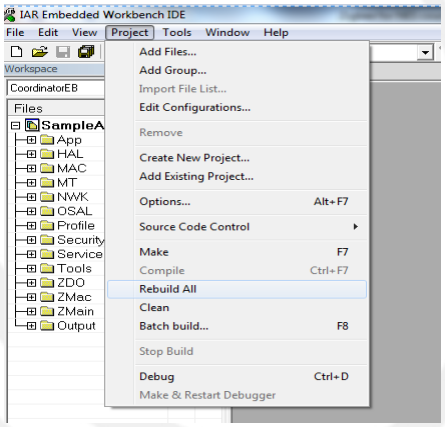
Generic App (3)

- Then
  - Project-> buildall
  - Project->Debug
    (for configuration)
- Reset zigBee kit from its switch.
  - S300 for EB
  - S2 for DB
- Repeat these steps to configure other devices



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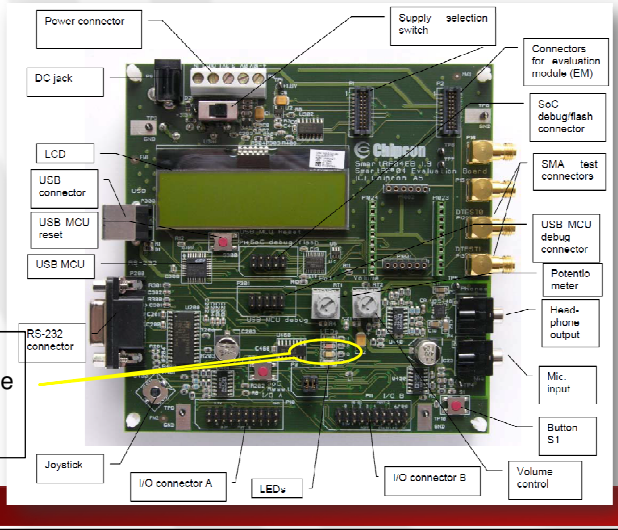
Network formation



Orange light is ON when the node formed the network

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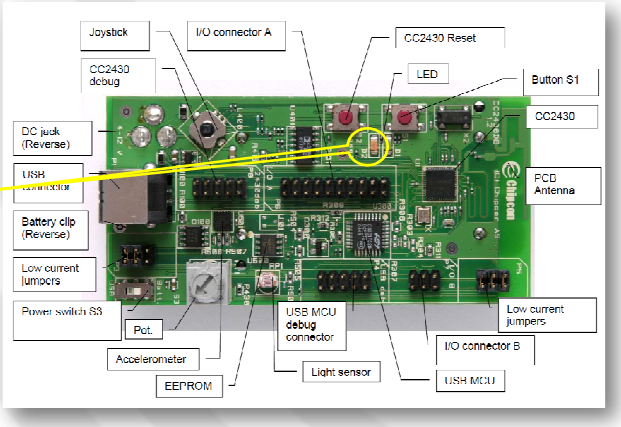
Join the network



Red light is ON when the node joins the network & Blinks when it disconnect from the network

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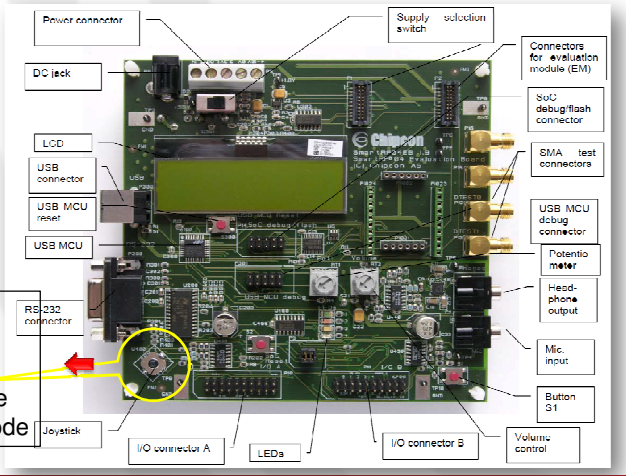
Auto scan mode



Push the joystick to the left to activate the auto scan mode

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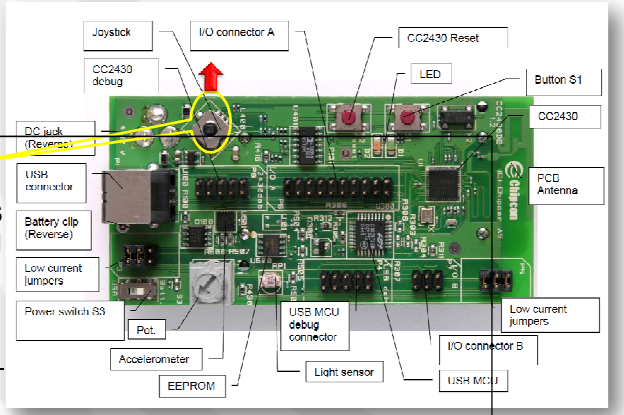
Send message



Push the joystick to the up To send "**Hello NES 2014**" message and observe the green light.
If it is ON, it means that the message is sent.

P.S. the applicatoin will continue send the message every 15 sec

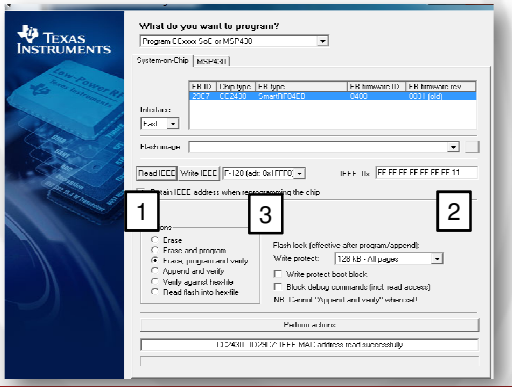
Change IEEE address

Open SmartRF tool

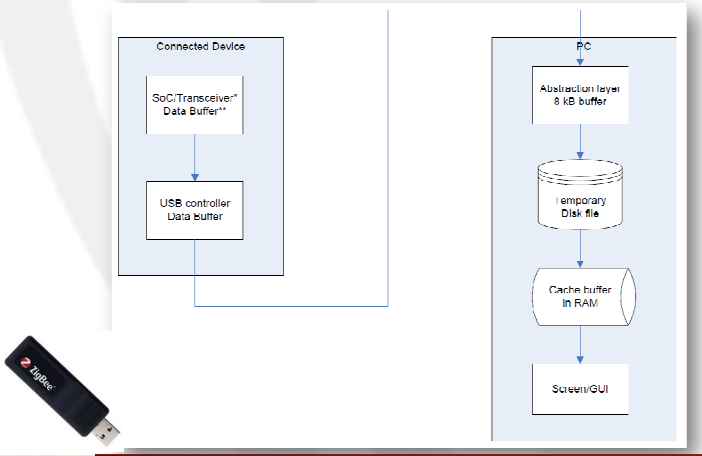
- IEEE address 8 bytes (static)

Click on:

1. Read
2. Change IEEE
3. Write



RF sniffing



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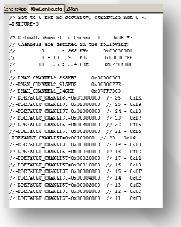
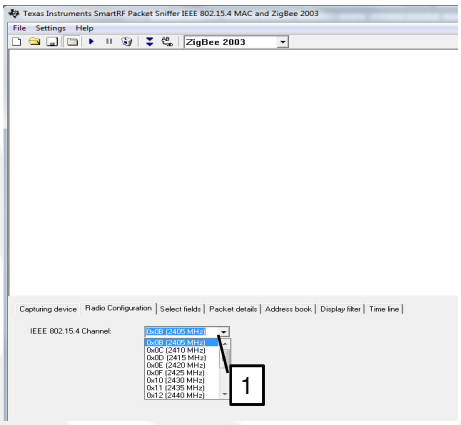
RF sniffing

1- Choose the desired sniffing operating frequency from the Pop-up list.

p.s. the frequency should be the same as the one in the application configuration file (.cfg).





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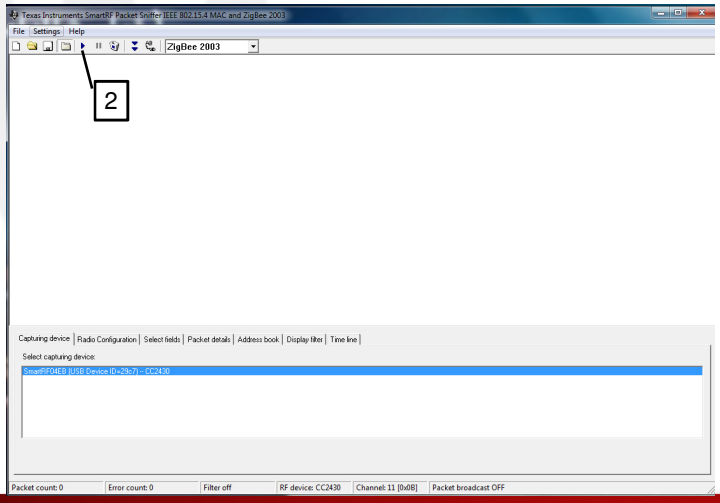
RF sniffing



RF sniffing

- Run the app

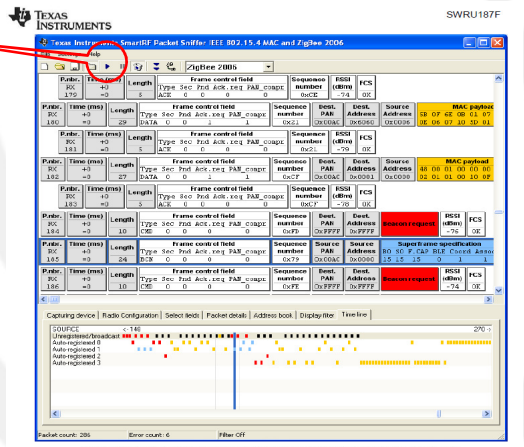


Figure 12: Packet sniffer screenshot from the IEEE8022.15.4/ZigBee protocols

Exercise

- Configure the application based on the following requirements:
  - Change the message to “Ciao NES”.
  - Change the operating frequency to 2415 MHz
  - Change the IEEE address of the coordinator node to “00 11 22 33 44 55 66 77”
  - Run the application and sniff the data
- Raise your hand when you are done

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