SILICA STM WiFi

SILICA STM WiFi EvaBoard

STM WiFi
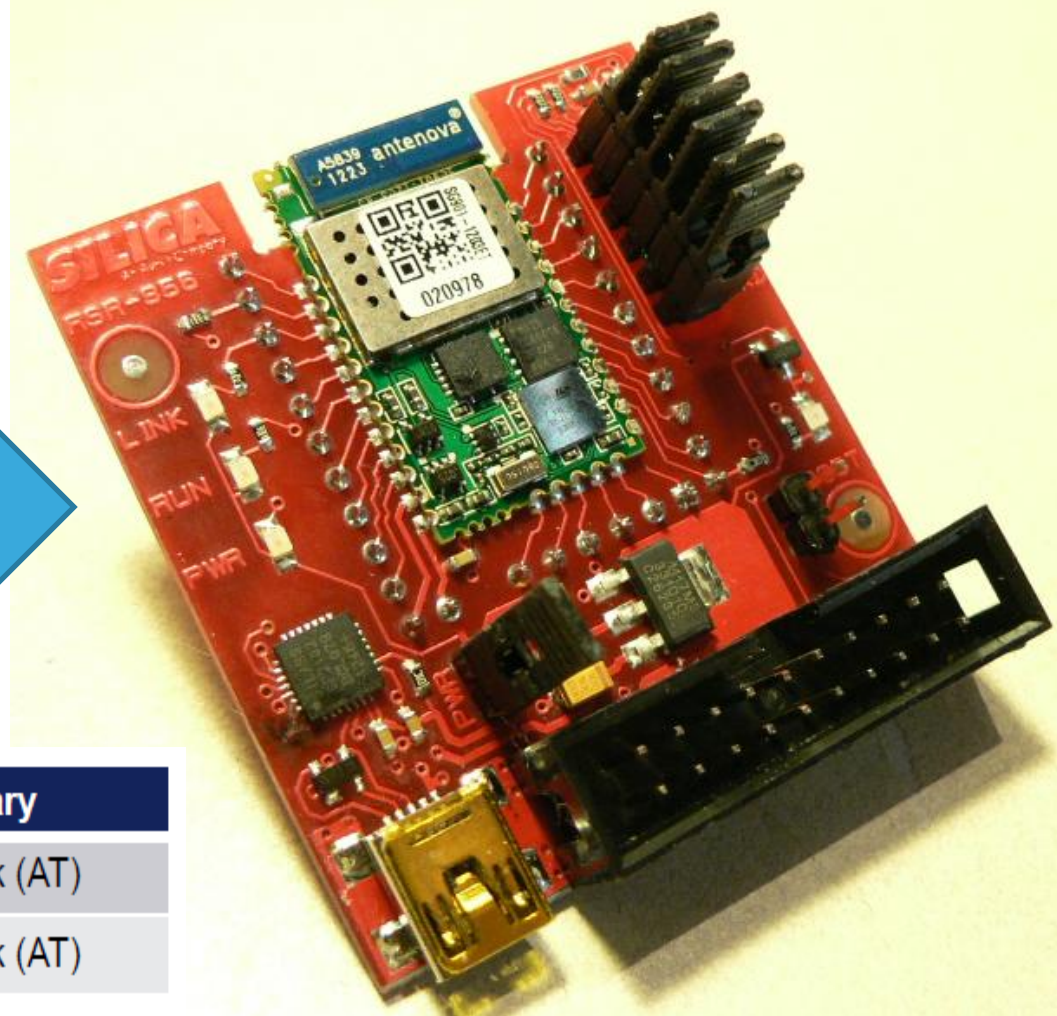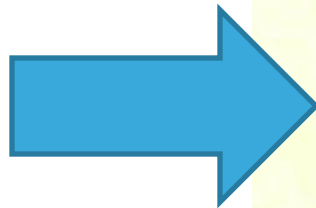
Part Number	Antenna Options	SW Library
SPWF01SA.11	Chip Antenna	Full Stack (AT)
SPWF01SC.11	U.FL	Full Stack (AT)

SILICA - STM WiFi EvaBoard
Full doc will be available here:
www.emcu.it/wifi

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STM32F0 + STM_WiFi = Web Server

All customers who want to perform practical tests on the Web Server, must install on their PC:

• **ST-LINK Utility** that is here:
  http://www.st.com/web/en/catalog/tools/PF258168

• For those who have **Windows7** we suggest to install **Tera Term**
  (http://en.wikipedia.org/wiki/Tera_Term) download it from this link:
  http://ttssh2.sourceforge.jp/index.html.en

• Install the driver for: **SILICON LABS CP2102** - VCP Driver Kit, download it from this link:
  http://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx

• **Angry IP Scanner** is here: http://sourceforge.net/projects/ipscan/?source=dlp

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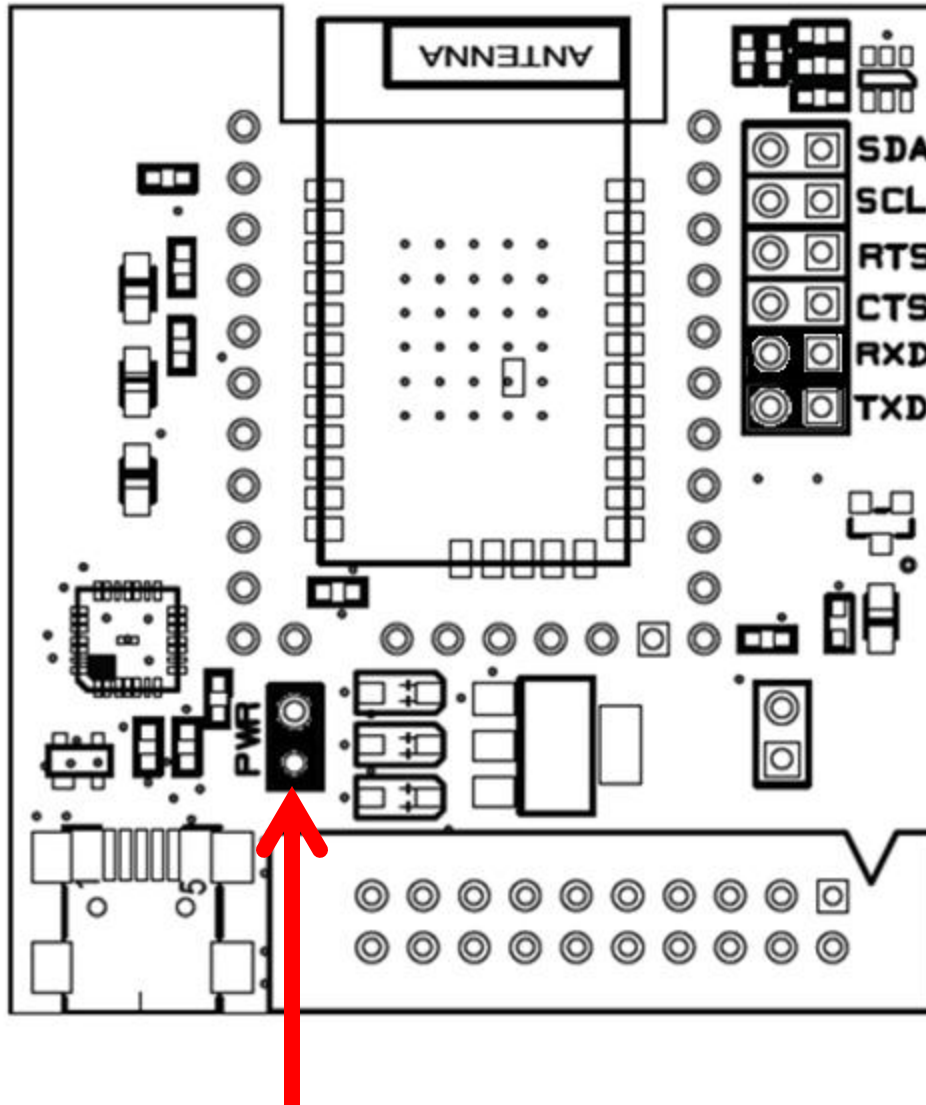Keep in mind the directionality of the antenna mounted on the WiFi module.

The arrows (see drawing) indicate the direction where the antenna is more sensitive.

Yellow arrow == Maximum sensitivity
Green arrow == Medium sensitivity
Black arrows == Low sensitivity
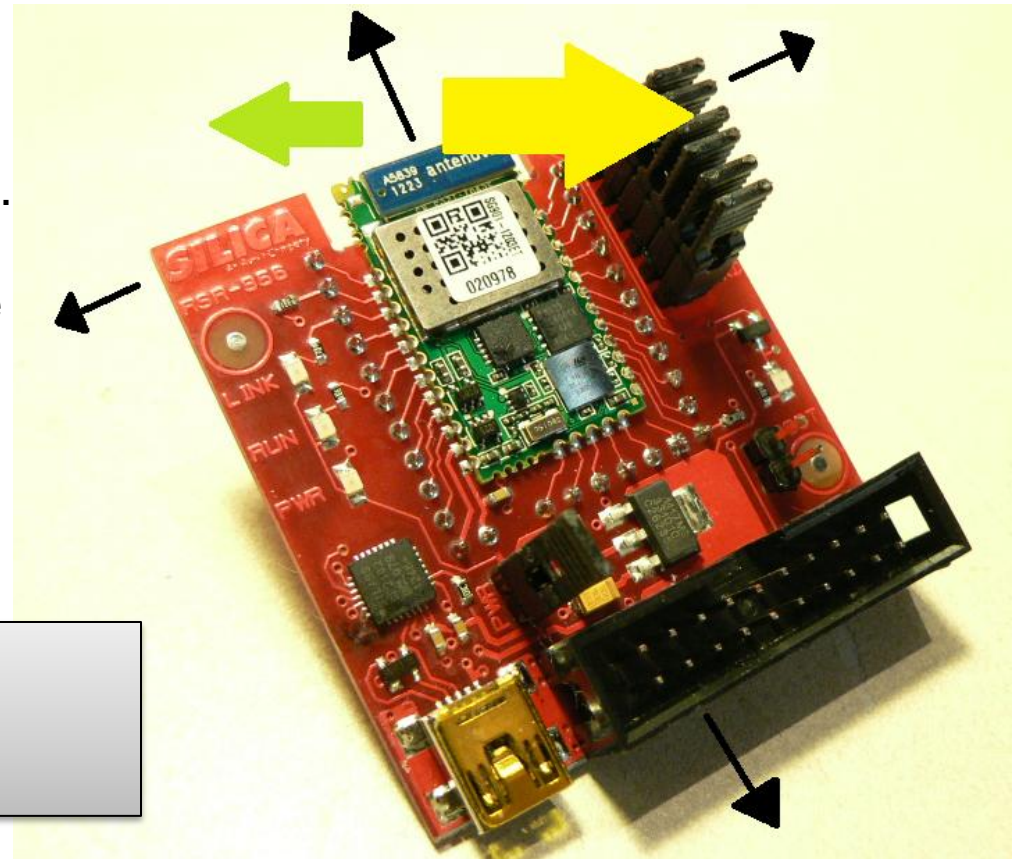
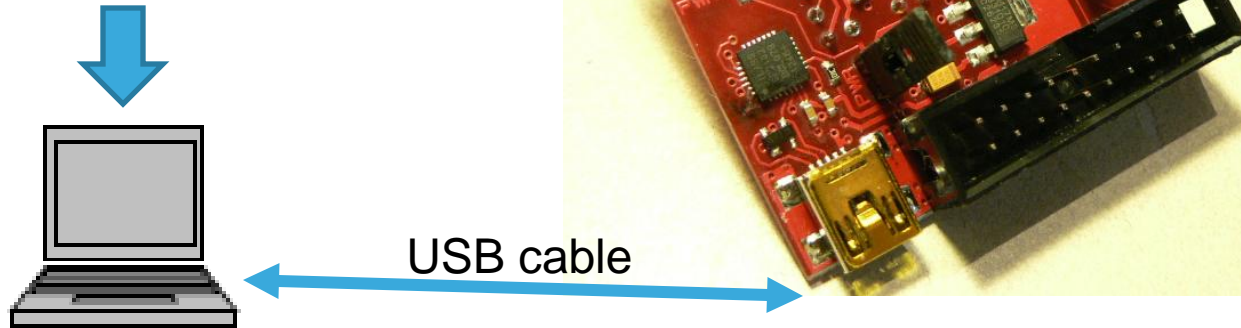# Connect to the PC the SILICA WiFi EvaBoard

TOP MOUNT

ATTENTION:
Only the jumpers: **PWR** , **TXD**, **RXD** must be present on SILICA STM WiFi EvaBoard

Connect to the PC the SILICA WiFi EvaBoard

For Windows7 we suggest to use: Tera Term

For Windows XP we suggest to use: Hyper Terminal

USB cable

The first time you connect the SILICA STM WiFi EvaBoard to PC probably it requests the driver (**SILICON LABS CP2102** - VCP Driver Kit) that you get here.
http://www.silabs.com/products/mcu/Pages/USBtoUARTBridgeVCPDrivers.aspx
The USB/RS232 driver is available for:
  Windows XP/Server 2003/Vista/7
  WinCE
  Macintosh OSX
  Linux

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SetUp Tera Term

Connect the STM WiFi module to a WiFi A.P./Router

at+s.ssidtxt=name_router
// Connect to WiFi router.
// Substitute **name_router** with your **WiFi-Router name**
at+s.scfg=wifi_wpa_psk_text, network_password
// SetUp the network password
// Substitute **network_password** with your **WiFi-Router password**
at+s.scfg=wifi_priv_mode,2
// SetUp the protection mode used in your WiFi-router network
// 0 == OPEN
// 1 == WEP
// 2 == WPA/WPA2
at+s.scfg=wifi_mode,1
// Set radio mode to STA (client station)
at+s.scfg=ip_use_dhcp,1
// Enable dhcp client. The WiFi-router give us the address.
at&w
// Save settings
at+cfun=1
// Soft reset

Currently connected to:

NETGEAR-3G
Internet access

Unidentified network
No network access

Wireless Network Connection

NETGEAR-3G   Connected

VodafoneInternetKey WiFi-9E1B90

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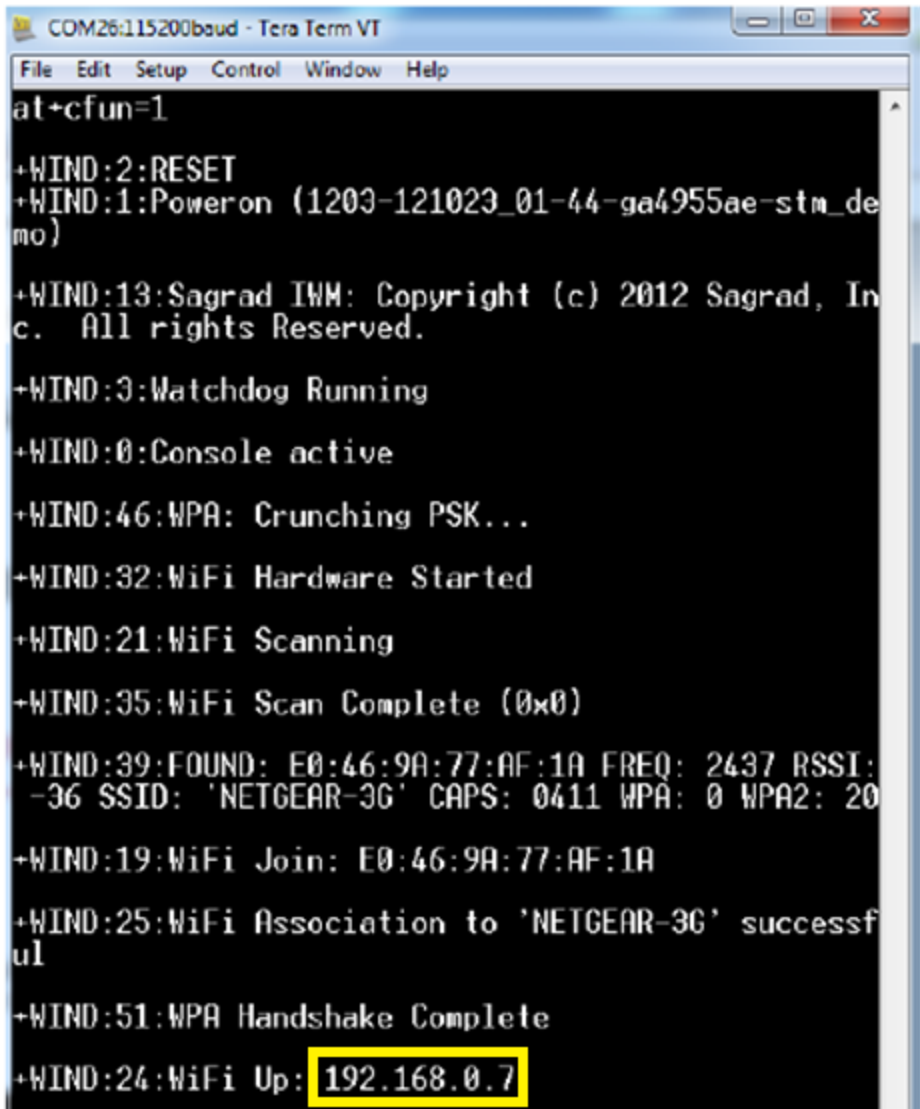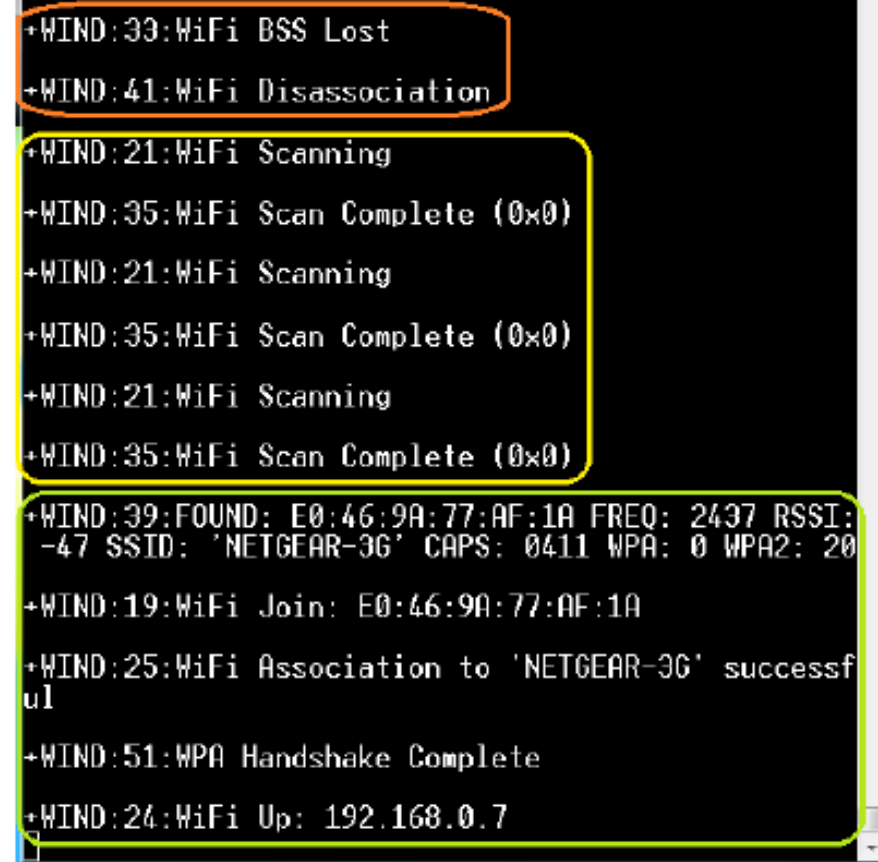
Connect the STM WiFi module to a WiFi A.P./Router

At the end of the command showed above the STM WiFi module is connected to WiFi network (see below).

```
COM26:115200baud - Tera Term VT
File  Edit  Setup  Control  Window  Help

at+cfun=1

+WIND:2:RESET
+WIND:1:Poweron (1203-121023_01-44-ga4955ae-stm_de
mo)

+WIND:13:Sagrad IWM: Copyright (c) 2012 Sagrad, In
c.  All rights Reserved.

+WIND:3:Watchdog Running

+WIND:0:Console active

+WIND:46:WPA: Crunching PSK...

+WIND:32:WiFi Hardware Started

+WIND:21:WiFi Scanning

+WIND:35:WiFi Scan Complete (0x0)

+WIND:39:FOUND: E0:46:9A:77:AF:1A FREQ: 2437 RSSI:
 -36 SSID: 'NETGEAR-3G' CAPS: 0411 WPA: 0 WPA2: 20

+WIND:19:WiFi Join: E0:46:9A:77:AF:1A

+WIND:25:WiFi Association to 'NETGEAR-3G' successf
ul

+WIND:51:WPA Handshake Complete

+WIND:24:WiFi Up: 192.168.0.7
```

```
+WIND:33:WiFi BSS Lost

+WIND:41:WiFi Disassociation

+WIND:21:WiFi Scanning

+WIND:35:WiFi Scan Complete (0x0)

+WIND:21:WiFi Scanning

+WIND:35:WiFi Scan Complete (0x0)

+WIND:21:WiFi Scanning

+WIND:35:WiFi Scan Complete (0x0)

+WIND:39:FOUND: E0:46:9A:77:AF:1A FREQ: 2437 RSSI:
 -47 SSID: 'NETGEAR-3G' CAPS: 0411 WPA: 0 WPA2: 20

+WIND:19:WiFi Join: E0:46:9A:77:AF:1A

+WIND:25:WiFi Association to 'NETGEAR-3G' successf
ul

+WIND:51:WPA Handshake Complete

+WIND:24:WiFi Up: 192.168.0.7
```

If WiFi network falls, the STM WiFi module highlights this (see the orange box above) and starts automatically a new scan for reconnecting the network. See above.

Some AT commands

*** List the current files set in your STM WiFi module or dongle.
AT+s.fsl

*** Dump all settings
AT&V

*** Report current status/statistics
AT+S.STS

*** Reset the WiFi
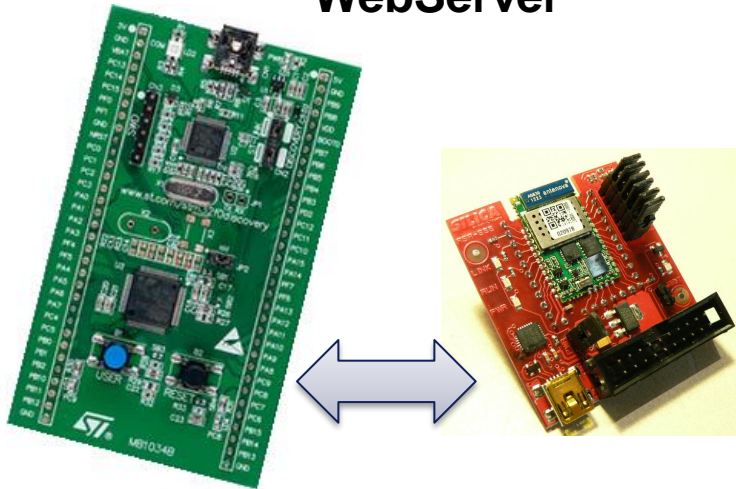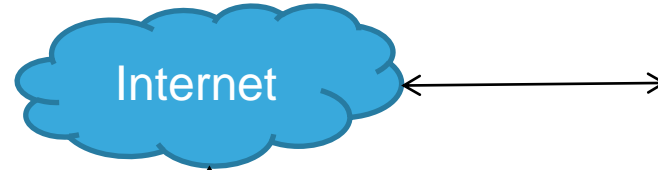**AT+CFUN=1**

Close Tera Term or Hyper Terminal and disconnect the SILICA STM WiFi EvaBoard from the PC

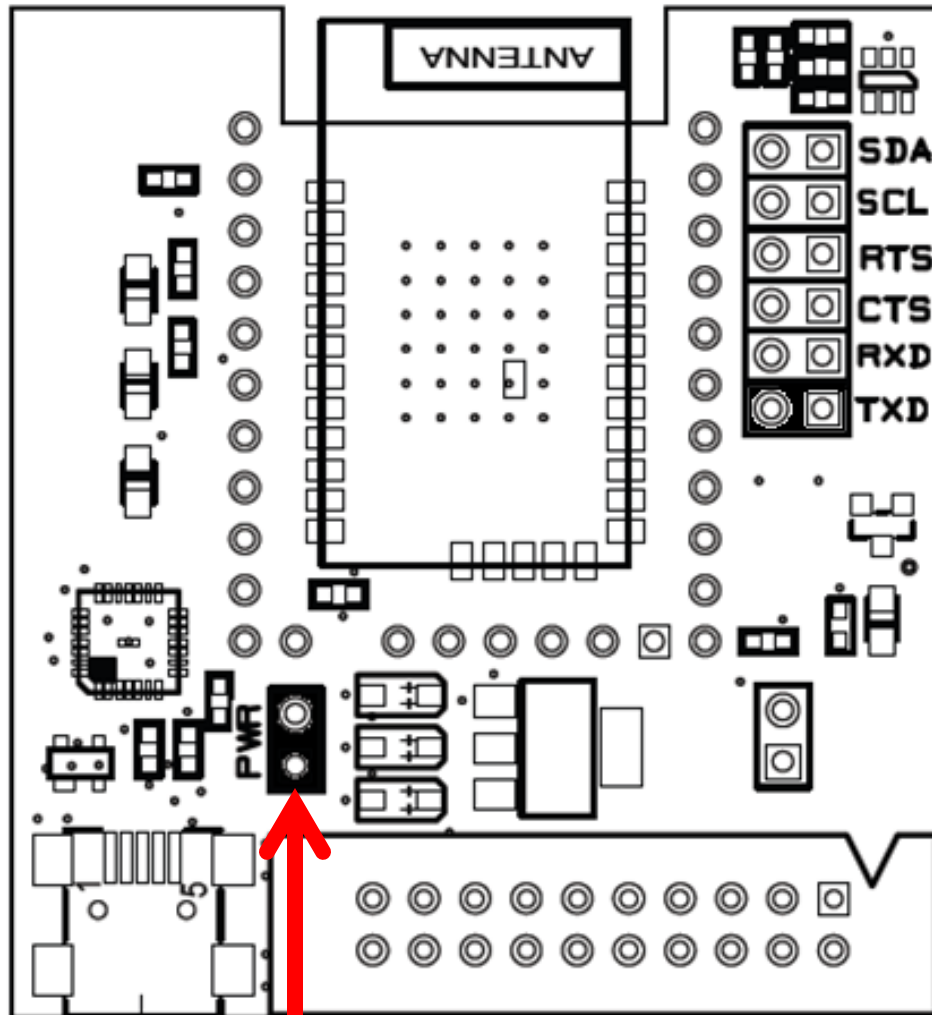# STM32F0 + STM_WiFi = Web Server

WebServer

Internet

To see on the Internet the WebServer, it is necessary to configure on the ADSL_Modem/Router the **Port Forwarding** and a **DynDNS**.

Connect STM WiFi module to STM32F0-Discovery

ATTENTION:
Only the jumpers: **PWR** and **TXD**
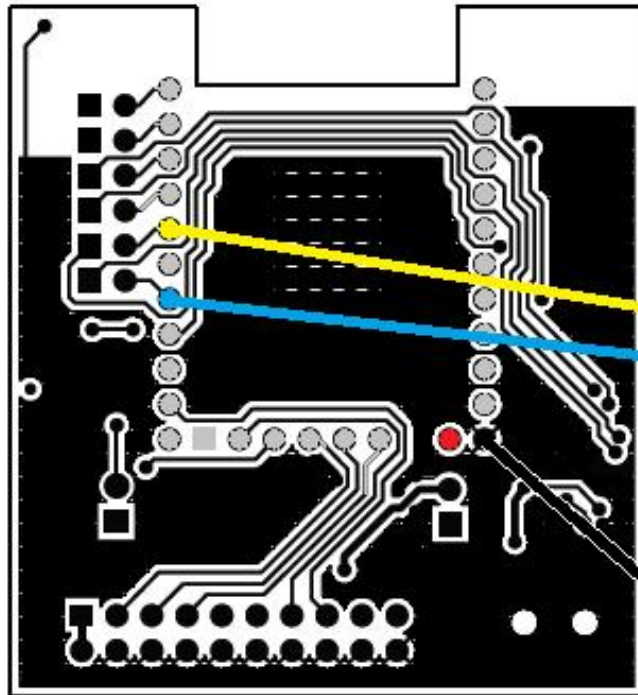must be present on SILICA STM WiFi
EvaBoard

STM32F0 + STM_WiFi = Web Server
Connect STM WiFi module to STM32F0-Discovery

TX	UART Transmit line	PA2	USART2_TX
RX	UART Receive line	PA3	USART2_RX

5V tollerant

SOLDER SIDE

RXD1	8	UART1 Receive data input	5V tolerant
TXD1	6	UART1 Transmit data output	5V Tolerant

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STM32F0 + STM_WiFi = Web Server


wiring

USB cables
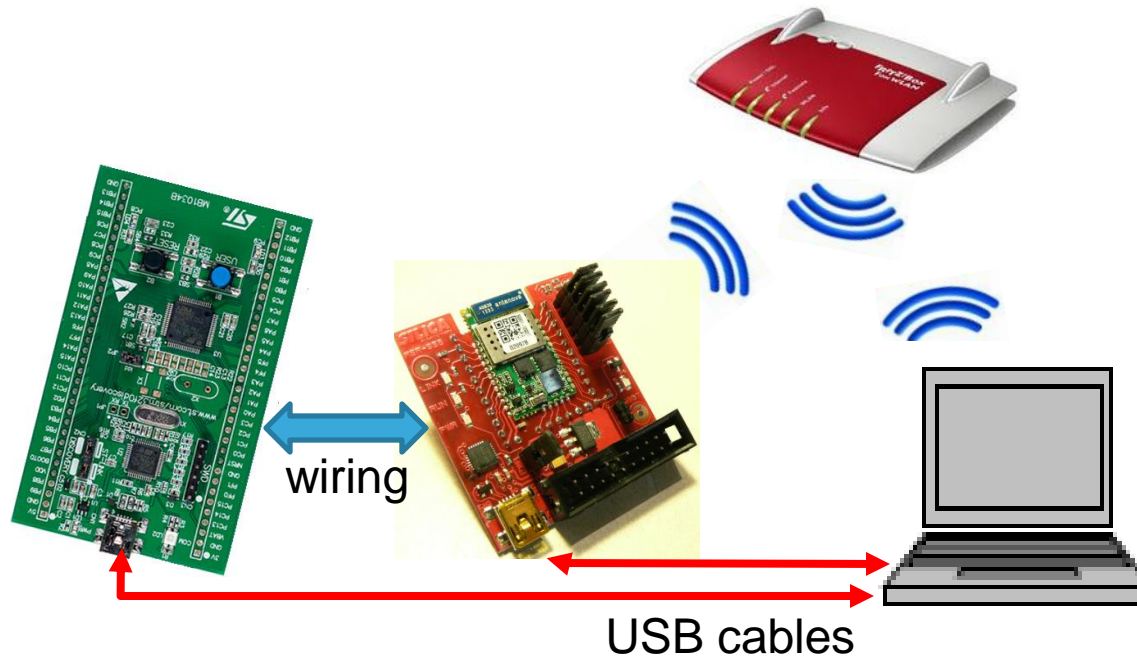
Remember:
- **Connect your PC WiFi to the classroom A.P./Router**
- **Connect Silica STM WiFi EvaBoard to your PC**
- **Connect the STM32F0-Discovery to your PC**

Optionally: if you connect a led (see schematic below) on STM32F0-Discovery from **PC6** and **GND,** you have the possibility to monitor the waiting from the answer from STM WiFi module.
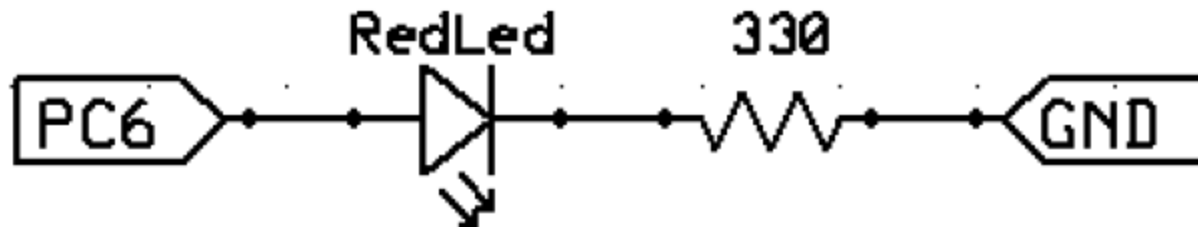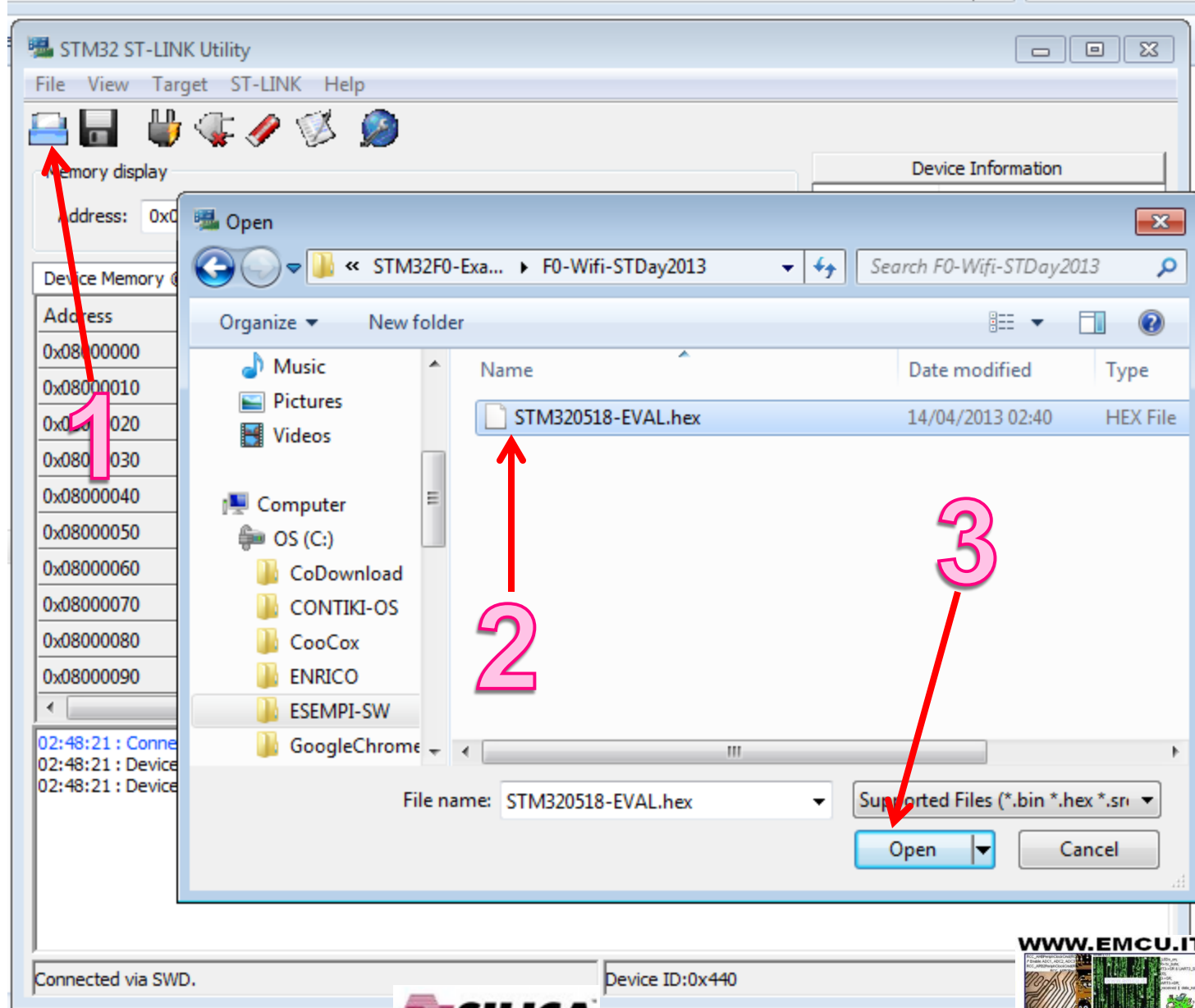
Run ST-LINK Utility and click on the icon shown in the image (1)
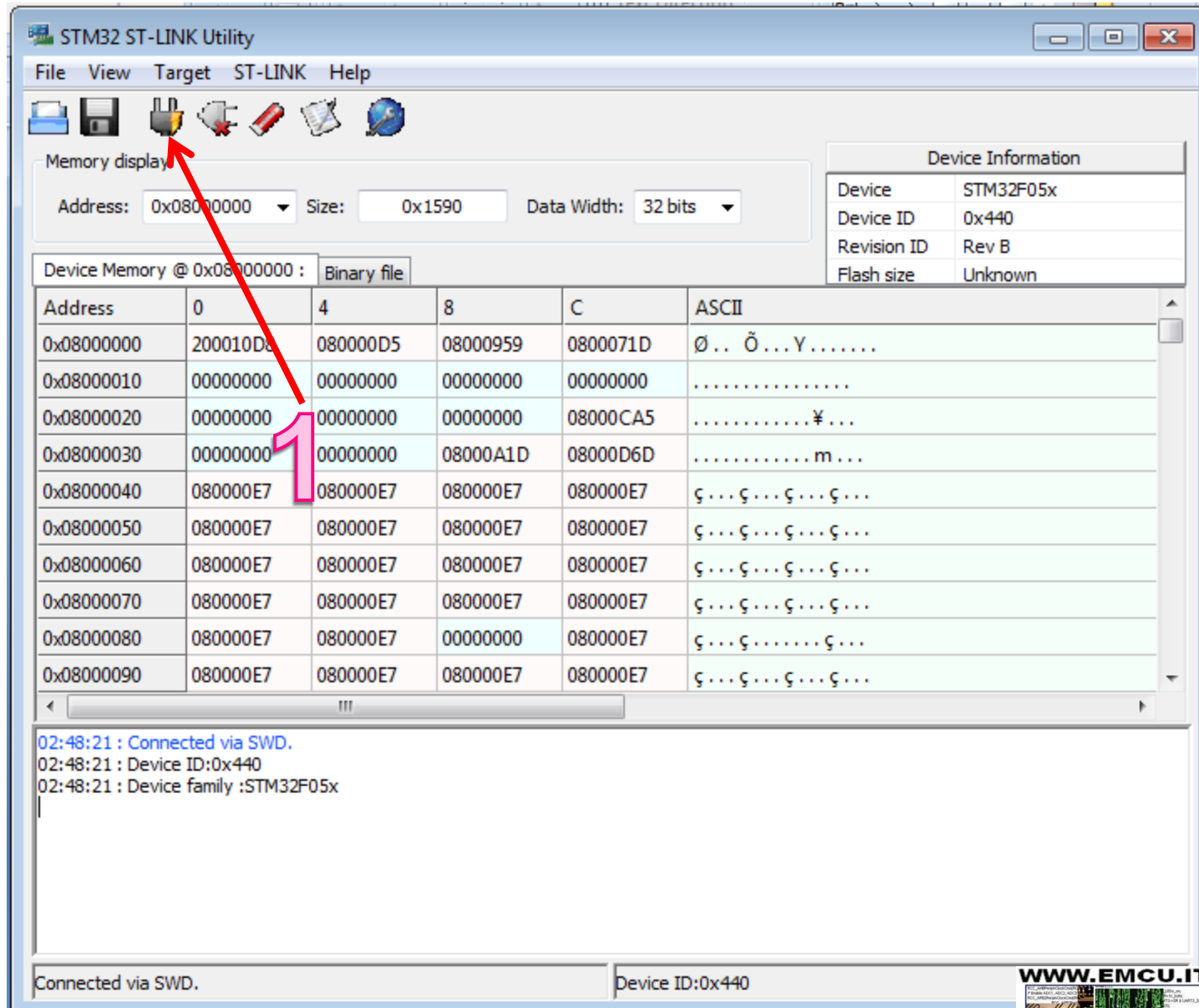
STM32F0 + STM_WiFi = Web Server
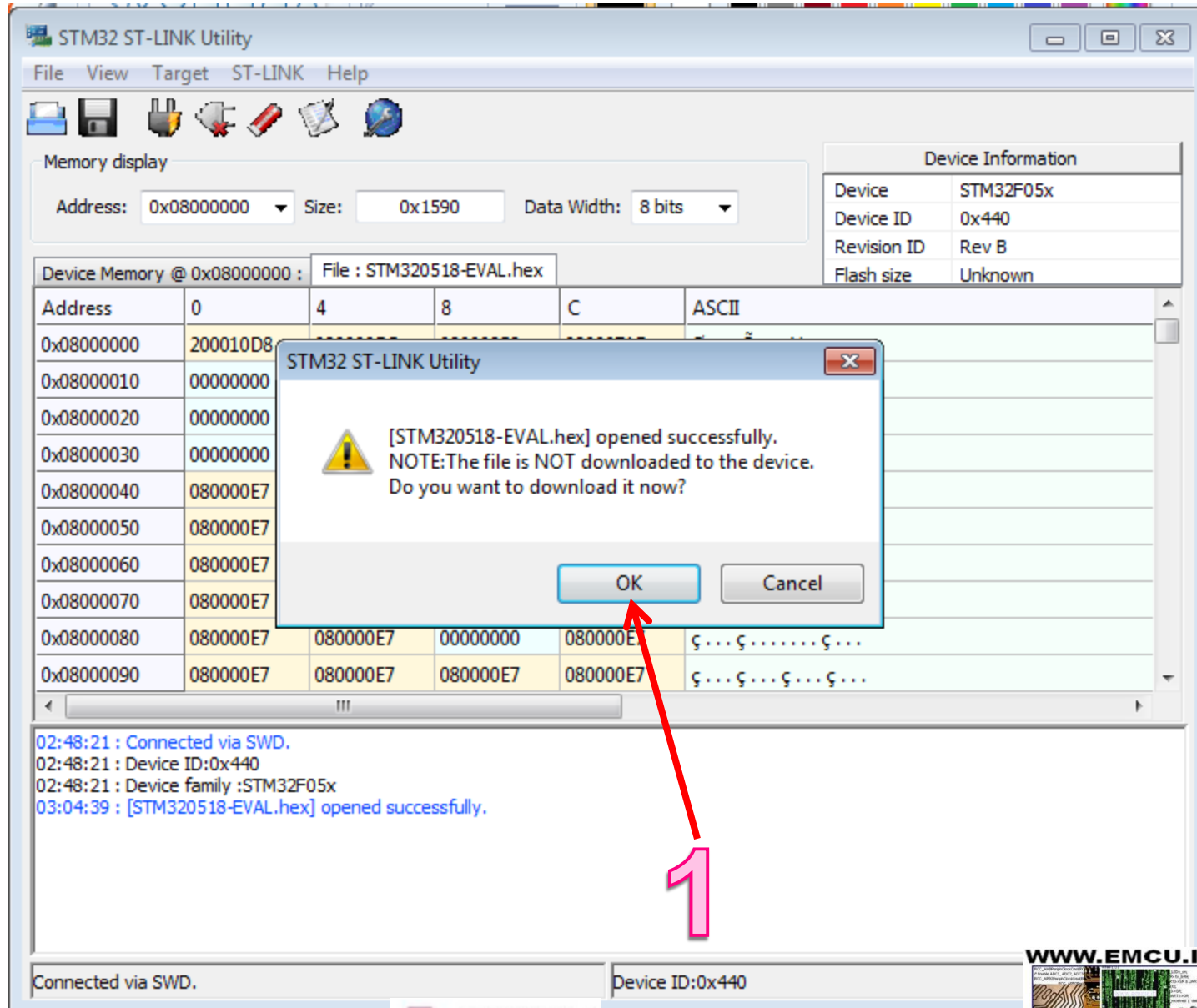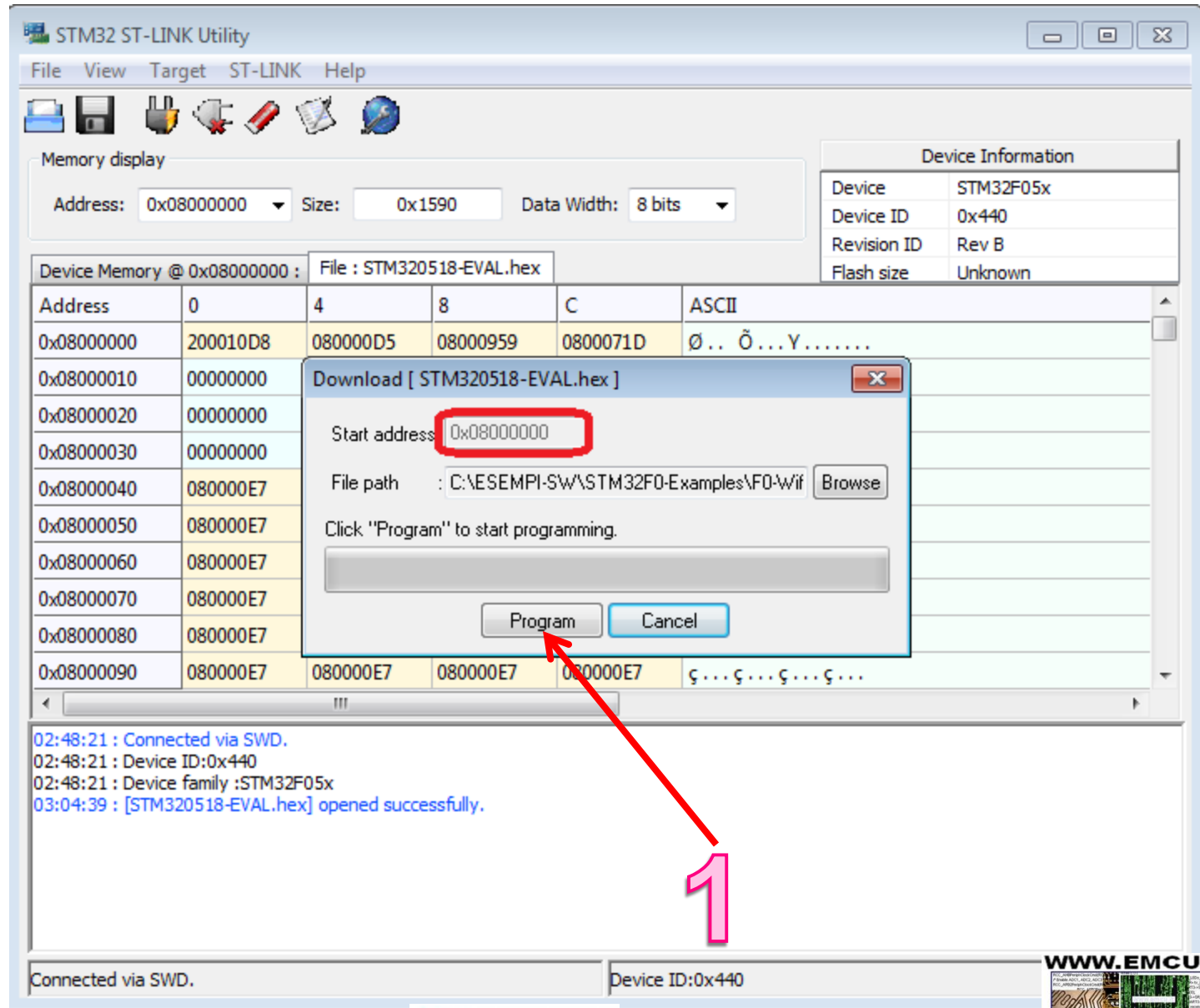
Follow the steps shown in the image (1, 2, 3)

Follow the step shown in the image (1)

STM32F0 + STM_WiFi = Web Server

Follow the step shown in the image (1)

STM32F0 + STM_WiFi = Web Server

Now you must see:
Verification… OK
(1)

- **Close the ST-LINK Utility**
- **Disconnect the USB cable from STM32F0-Discovery**
- **Wait a second**
- **Reconnect the USB cable to STM32F0-Discovery.**

STM32F0 + STM_WiFi = Web Server

- Now run **Tera Term** or **Hyper Terminal** and **press and release** the **black button** on the STM32F0-Discovery.
  This is for reset the STM32F0-Discovery.
- For doing the connection just **press and release the blue button** on the STM32F0-Discovery.
  At this point you see the **Blue led that flashing** and the **Red led that changes from OFF to ON**.
  After some seconds, **Blue** and **Green** leds are **flashing** and **this means that the STM WiFi module is trying to connect to the WiFi Router**.
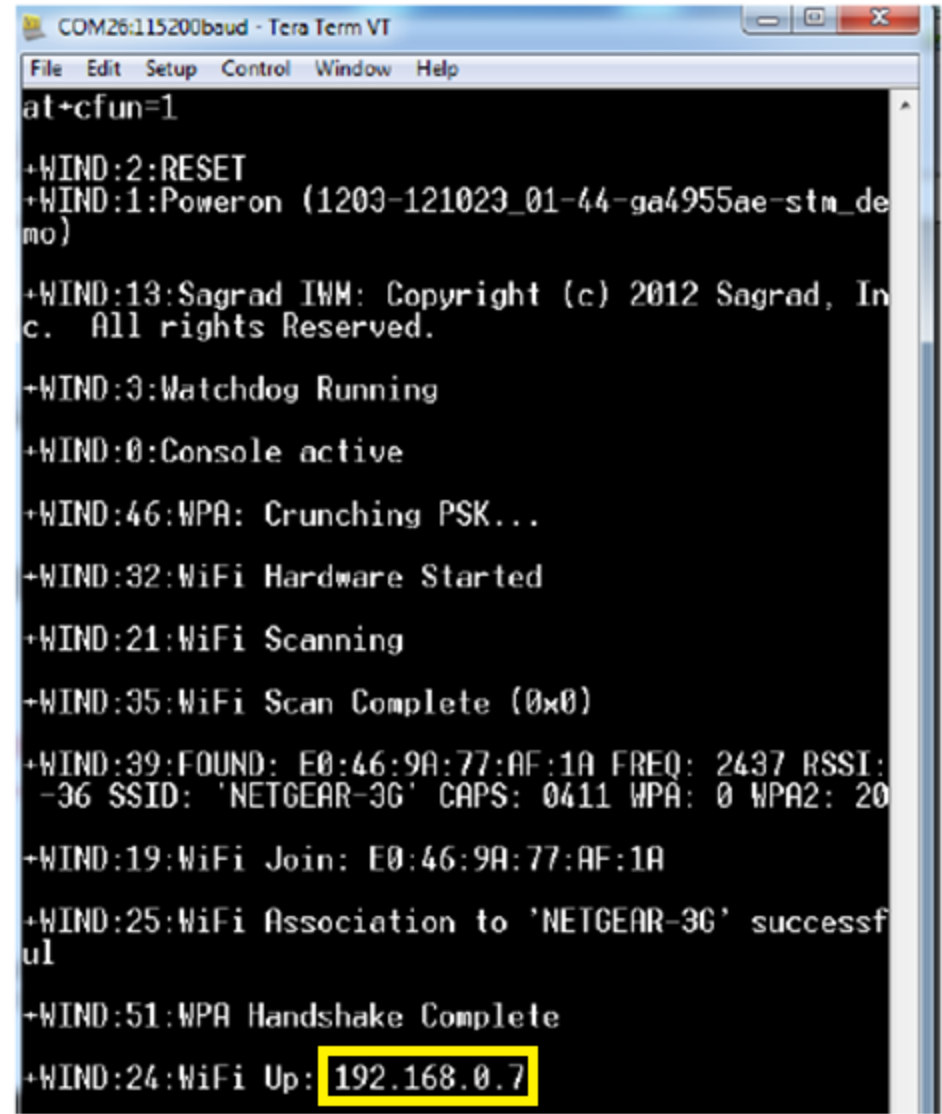 After 20/60 sec, Blue and Green leds go **OFF** and **this means that the connection is done**.
- Also, the led **LED2 must be ON**. LED2 (LINK) is on the SILICA STM WiFi EvaBoard, this means that the WiFi connection is active.
- At this point, it is also loaded on the STM WiFi module, the html page named: **led.hmtl**
  This page shows the status of the LEDs mounted on the STM32F0-Discovery.

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STM32F0 + STM_WiFi = Web Server

WiFi Sniffing

In the terminal **Tera Term** or **Hyper Terminal** you will see something similar to the image showed here.
In the yellow box there is the address that the access point and/or router have assigned to our WiFi card.


```
COM26:115200baud - Tera Term VT
File  Edit  Setup  Control  Window  Help

at+cfun=1

+WIND:2:RESET
+WIND:1:Poweron (1203-121023_01-44-ga4955ae-stm_de
mo)

+WIND:13:Sagrad IWM: Copyright (c) 2012 Sagrad, In
c.  All rights Reserved.

+WIND:3:Watchdog Running

+WIND:0:Console active

+WIND:46:WPA: Crunching PSK...

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+WIND:19:WiFi Join: E0:46:9A:77:AF:1A

+WIND:25:WiFi Association to 'NETGEAR-3G' successf
ul

+WIND:51:WPA Handshake Complete

+WIND:24:WiFi Up: 192.168.0.7
```

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STM32F0 + STM_WiFi = Web Server

Scan your local network to find the IP of the SILICA STM WiFi EveBoard

To scan your local network I suggest to use: **Angry IP Scanner**
that is here: http://sourceforge.net/projects/ipscan/?source=dlp
Below there are two scans.
In the left window, the STM WiFi module is not connected to the WiFi network.
In the right window, the STM WiFi module is connected to the WiFi network.
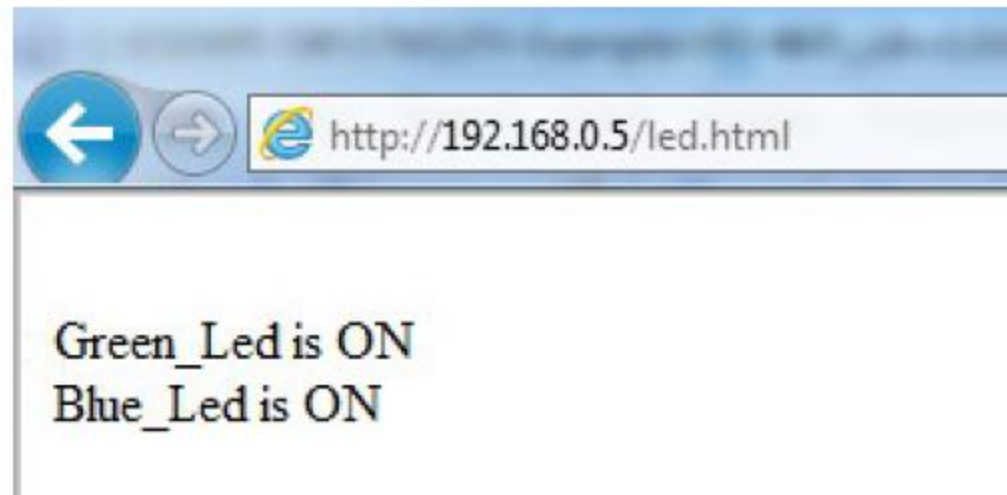
STM32F0 + STM_WiFi = Web Server

Now open the html page (use Windows Internet Explorer):
led.html
this page show the status of the Green and Blue LEDs mounted on your STM32F0-Discovery.

- **Suppose that the STM WiFI IP is: 168.169.0.5**
- Open your browser and type:
  192.168.0.5/led.html

http://192.168.0.5/led.html

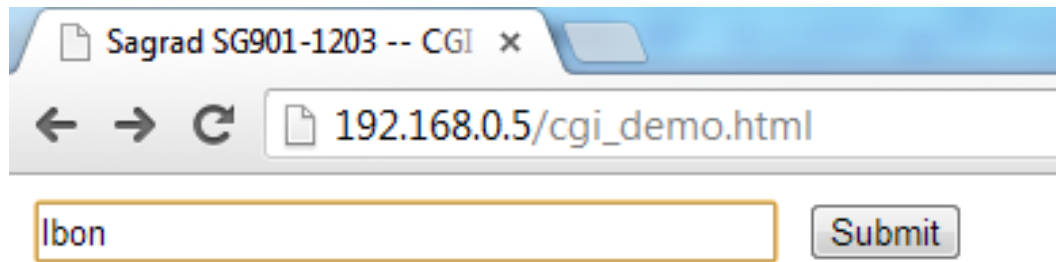Green_Led is ON
Blue_Led is ON

STM32F0 + STM_WiFi = Web Server

Now open the html page (use Windows Internet Explorer):
cgi_demo.html
this page is used to send commands to STM WiFi Module.

- **Suppose that the STM WiFI IP is: 168.169.0.5**
- Open your browser and type:
    192.168.0.5/cgi_demo.html
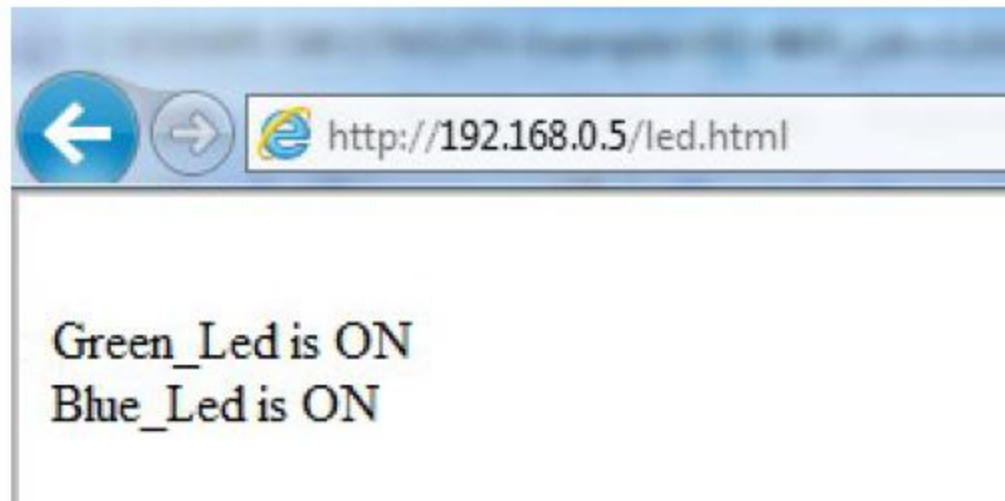
STM32F0 + STM_WiFi = Web Server

The custom commands (implemented on STM32F0-Discovery) to control the SILICA STM WiFi EvaBoard are:

- **lgon** – TurnON the green LED
- **lgoff** – TurnOFF the green LED
- **lbon** – TurnON the blue LED
- **lboff** – TurnOFF the blue LED
- **X** – Clear RxBuffer
- **reset** – reset the STM WiFi module, it reloads the WiFi configuration received from STM32F0-Discovery.
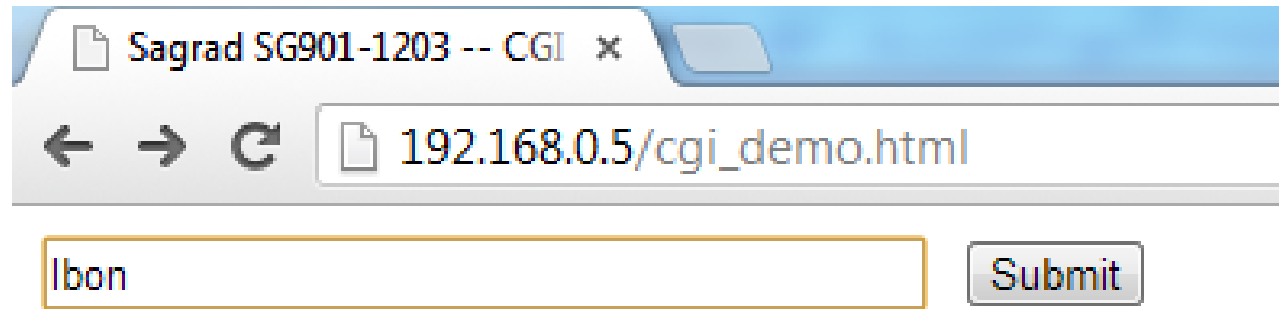 During the reset the Blue and Green Leds are flashing.

You have the possibility to **see the LEDs status** in the page: **led.html**
Remember: you must reload the **led.html** page after every command sent by using the **cgi_demo.html** page.

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STM32F0 + STM_WiFi = Web Server

Sagrad SG901-1203 -- CGI

192.168.0.5/cgi_demo.html

lbon   Submit
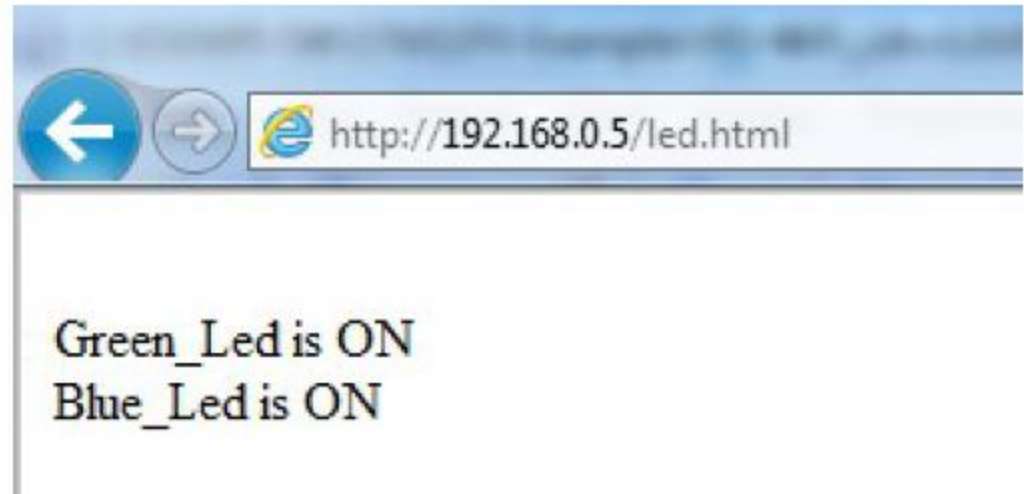
Try the commands:
 • **lgon** – TurnON the green LED
 • **lgoff** – TurnOFF the green LED
 • **lbon** – TurnON the blue LED
 • **lboff** – TurnOFF the blue LED
and see the results,
**remember to reload
the page after any
command.**

http://192.168.0.5/led.html

Green_Led is ON
Blue_Led is ON

Close Tera Term or Hyper Terminal and disconnect the boards from the PC.

Please give me back the:

SILICA STM WiFi EvaBoard

The TWO USB cables

What we offer

- **A complete source code for STM32F0xx** family that is very easy to transfer on other STM32 families (Cortex Mx).
- **A complete manual that covers the topics below.**
  - Resource available via STM WiFi pins
  - Firmware update
  - HTML pages
  - How to use the SILICA STM WiFi EvaBoard
  - AT Commands
  - AT SetUp commands (to connect STM WiFi module to WiFi network)
  - AT GPIO commands
  - AT General Commands
  - Create a filename.html (a complete HTML example)
  - NotePad++
  - How to use Tera Term
  - How to connect STM WiFi module to STM32F0-Discovery (Web Server), **C source code**
  - How to scan your local network
  - How to use **PYTHON** on **LINUX** to drive STM WiFi module
  - How to use **PYTHON** on **Windows 7** to drive STM WiFi module

- **A complete manual that explains the SW implementation and that covers the topics below**

  - How to connect STM WiFi module to STM32F0-Discovery
  - The Web pages
  - The definitions
  - The variables
  - The principal functions

More info are available here: www.emcu.it/wifi

enrico.marinoni@silica.com FAE

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