How to use example A/B that is present in SPIRIT1 SDK 2.0 on IAR 32K free version (rel.7.20)

Introduction The Working Directory Select (include) and deselect (exclude) files from IAR project Configure the A evaboard Address SPIRIT1 module quartz frequency Frequency of Tx/Rx Compile the A (Tx) example Configure the B evaboard Address SPIRIT1 module quartz frequency Frequency of Tx/Rx Compile the B (Rx) example

Introduction

This explanation is based on: **SPIRIT1 DK 2.0.0** (STSW-CONNECT009 - Setup for SPIRIT1 design kit) that is <u>here</u>.

The example A/B is very simple example that implement a simple Tx/Rx link using two SPIRIT1 <u>evaboard</u>.

EveBoard **A** is the **Tx**, the EvaBoard **B** is the **Rx**.



OLD evaboard version



LED Link Tx/Rx OK

After you ave programmed two evaboard, A that is Tx and B that is Rx, (see explanation later in this manual) you reset both the evaboard and you must see: Evaboard A:

DL9 (green) ON - It is present only on the OLD evaboard board version

DL1 (green) flashing

Evaboard **B**:

DL9 (green) ON - It is present only on the OLD evaboard board version DL1 (green) ON

DL2 (orange) flashing

This means that the Tx/Rx link is present.

LED Link Tx/Rx FAIL

If you **Turn Off** the evaboard **A** you must see in evaboard **B** the LED in this conditions: DL9 (green) ON – *It is present only on the OLD evaboard board version* DL1 (green) flashing DL2 (orange) ON or OFF **is not important** This means that the link Tx/Rx is lost.

How to test this example

Simply program the two boards (A and B) and power it. You must see on board A the green led (DL1) flashing and on Board B the green led

You must see on board A the green led (DL1) flashing and on Board B the green led (DL1) ON.

Turn off the board A and on the board B you must see the green led (DL1) flashing.

The Working Directory

C:\...\STM_SIRIT1Q\IAR-SW-A-B\Firmware\SPIRIT1_Library_Project\EWARM

Select (include) and deselect (exclude) the file from IAR project

For select (include) or deselect (exclude) a file in IAR you must click on it with the **right mouse button** and from the window that appear select **Option**. At this point a new window is open and on the top you have a **flag for include** or **exclude** a file from the project. See below.



Configure the address in A evaboard (Tx)

In the file: **SDK_Configuration_Common.h**

You must set the Addresses of the TX **A** board (in our case is **0x44**, and destination is **0x34**), see below.

/* Addresses configuration parameters */
#define EN_FILT_MY_ADDRESS S_DISABLE
#define MY_ADDRESS 0x44
#define EN_FILT_MULTICAST_ADDRESS S_DISABLE
#define MULTICAST_ADDRESS 0xEE
#define EN_FILT_BROADCAST_ADDRESS S_DISABLE
#define BROADCAST_ADDRESS 0xFF
#define DESTINATION ADDRESS 0x34



Also you must configure (on the evaboard A) the quartz frequency mounted on your SPIRIT1 module that for 169Mhz is 25MHz and for 868MHz is 50MHz

The example below is for 169MHz.

Open the file: **SDK_BasicGeneric_A.c** and in the section **/* Includes** (it is at top of the file) specify: **25000000**, see below.

/* Includes /* Include "SDK_EVAL_Config.h" #include "SPIRIT_Config.h" #include "SDK_Configuration_Common.h" #include "SPIRIT_SDK_Util.h" //#define USE_VCOM #define XTAL_FREQUENCY 25000000 #define SPIRIT_VERSION SPIRIT_VERSION_3_0

#include "SDK Common.h"



Frequency for Tx/Rx (on the evaboard A and B)

Now is necessary configure the frequency of the Tx/Rx of the SPIRIT1 module that is in use .

See the explanation that are <u>here</u>.

Compile the A (Tx) example

Include the SDK_BasicGeneric_A.c and exclude the SDK_BasicGeneric_B.c from the compilation.

See below.

For know how to do this read <u>here</u>.

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Before to do the compilation do the step show below 1...8. Click with the **left button** of the **mouse** on: **Spirit_Library_Project-**

SDK_BasicGeneric_A *

Click with the **right button** of the **mouse** on: **Spirit_Library_Project-SDK_BasicGeneric_A** *, and choose **Options**

From the new window that appear set in the box **5**, **6** and **7** the name:

SDK_BasicGeneric_<mark>A</mark>\Exe

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SDK_BasicGeneric_A\List

Next press **OK**.

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Now select: **Project -> Clean** See below.



Now select: **Project -> Rebuild All** See below.

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At the end of the compilation you must see:



In the directory: C:\...\STM_SIRIT1Q\IAR-SW-A-B\Firmware\SPIRIT1_Library_Project\EWARM**SDK_BasicGeneric_A** you must see the results of the compilation. See below.



Now, using the <u>ST-LINK-v2</u>, download the FW to the evaboad **A**. The FW is here: C:\...\STM_SIRIT1Q\IAR-SW-A-B\Firmware\SPIRIT1_Library_Project\EWARM\SDK_BasicGeneric_A**Exe** and the name is: **SDK_BasicGeneric_A.hex** To download the FW you must use the <u>ST-LINK-Utility</u> and download the FW at the address: <u>0x08003000</u>

Configure the address in **B** evaboard (Rx)

In the file: **SDK_BasicGeneric_B.c** You must set the Addresses of the RX **B** board (in our case is **0x34**, and destination is **0x44**), see below.

/* Addresses configuration parameters */
#undef MY_ADDRESS
#define MY_ADDRESS 0x34
#undef DESTINATION_ADDRESS
#define DESTINATION_ADDRESS 0x44

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#endif
#endif

Also you must configure (on the evaboard B) the quartz frequency mounted on your SPIRIT1 module that for 169Mhz is 25MHz and for 868MHz is 50MHz

The example below is for 169MHz.

Open the file: **SDK_BasicGeneric_B.c** and in the section **/* Includes** (it is at top of the file) specify: **25000000**, see below.

/* Includes*/ #include "SDK_EVAL_Config.h" #include "SPIRIT_Config.h" #include "SDK Configuration Common.h" #include "SPIRIT SDK Util.h" //#define USE VCOM #define XTAL FREQUENCY 25000000 #define SPIRIT VERSION SPIRIT VERSION 3 0 #ifdef STM8L #include "STM8L Common.h" #define XTAL FREQUENCY 50000000 #define SPIRIT VERSION SPIRIT VERSION 3 0 RANGE_EXT_NONE #define RANGE TYPE //RANGE EXT SKYWORKS #elif SDK #include "SDK Common.h" #ifdef USE VCOM #include "SDK EVAL VC General.h"



Click <u>here</u> to go to the INDEX

Frequency for Tx/Rx (on the evaboard A and B) - The example below is for 169MHz.

Now is necessary configure the frequency of the Tx/Rx of the SPIRIT1 module that is in use. Open the file: **SDK_Configuration_Common.h** and specify the frequency, in our case, we did the test using SPIRIT1 module at 169MHz, the declaration must be: **USE_VERY_LOW_BAND** See below.

```
/**
* @file SDK BasicPktTest Common.h
* @author AAS & RF - AMS
* @version 3.1.0
* @date March 1, 2014
* @brief Common configuration header file.
* @details
* THE PRESENT FIRMWARE WHICH IS FOR GUIDANCE ONLY AIMS AT PROVIDING CUSTOMERS
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LOCATED
* IN THE ROOT DIRECTORY OF THIS FIRMWARE PACKAGE.
*
* <h2><center>&copy; COPYRIGHT 2014 STMicroelectronics</center></h2>
*/
/* Define to prevent recursive inclusion
     ....*/
#ifndef __SDK_PKT_TEST_COMMON_H
#define SDK PKT TEST COMMON H
#define USE VERY LOW BAND
```

Other possible definitions (present in the same file) for different frequencies are:

#ifdef USE_VERY_LOW_BAND #define BASE_FREQUENCY #endif	169.0e6
#ifdef USE_LOW_BAND #define BASE_FREQUENCY #endif	315.0e6
#ifdef USE_MIDDLE_BAND #define BASE_FREQUENCY #endif	433.0e6
#ifdef USE_HIGH_BAND #define BASE_FREQUENCY #endif	868.0e6

Compile the B (Rx) example

Now do the same that you did for A also on the **B** evaboard but **exclude from the compilation** the **SDK_BasicGeneric_B.c** and **include** the **SDK_BasicGeneric_B.c**

Before to do the compilation do the step show below 1...8. Click with the left button of the mouse on: Spirit_Library_Project-SDK_BasicGeneric_A * Click with the right button of the mouse on: Spirit_Library_Project-SDK_BasicGeneric_A *, and choose Options From the new window that appear set in the box 5, 6 and 7 the name: SDK_BasicGeneric_B\Exe SDK_BasicGeneric_B\Dbj SDK_BasicGeneric_B\List Next press OK.



Now rebuild all: **Project -> Clean Project -> Rebuild All**

In the directory: C:\...\STM_SIRIT1Q\IAR-SW-A-B\Firmware\SPIRIT1_Library_Project\EWARM**SDK_BasicGeneric_B** you must see the results of the compilation.

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B\Firmware\SPIRIT1_Library_Project\EWARM\SDK_BasicGeneric_**B****Exe**

and the name is: **SDK_BasicGeneric_B.hex**

To download the FW you must use the **<u>ST-LINK-Utility</u>** and download the FW at the address: **0x08003000**