



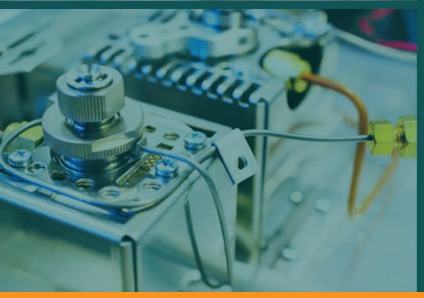


Radiocrafts

Embedded Wireless Solutions

AN005: PORTING THE Z-STACK HCL TO RC2200DK

APPLICATION NOTE

We Make Embedded Wireless
Easy to Use

Porting the Z-stack HCL to RC2200DK

By P.M.Evjen

Introduction

This application note describe how to port the Figure 8 Wireless Z-stack Home Control Lighting (HCL) example from the Chipcon CC2420DB to the Radiocrafts RC2200DK. The main difference between the two hardware platforms are the I/O ports used for LEDs and switches. Also, the RC2200 module does not have external RAM.

Know open issues

There is one open issue:

After MAC address has been set and MAC initialized, the application hangs in OSAL_Task.c at osalRaskAdd():

```
// Stop at the end
      while ( srchTask->next )
        srchTask = srchTask->next;
```

We are working on this problem.

Adding new header files

New header files are made for redefinition of I/Os:
RC2200DK_hal_mods.h
RC2200DK_board_mods.h

These new header files

- Use #undef to remove definitions not relevant for RC2200DK
- Use a combination of #undef and #define in order to redefine some I/O that are moved
- Use #define if symbol is unique for RC2200DK

These header files must be included at the end of hal_cc2420db.h in this way:

```
//RC:
#ifdef USE_RC2200DK
#include "RC2200DK_hal_mods.h"
#warning("Using RC2200DK_hal_mods.h - RC2200DK modified board definitions!")
#endif
```

And similar in OnBoard.h in this way:

```
//RC:
#ifdef USE_RC2200DK
#include "RC2200DK_board_mods.h"
#warning("Using RC2200DK_board_mods.h - RC2200DK modified board definitions!")
#endif
```

The inclusion of these header files require the definition of USE_RC2200DK in the Makefile:

```
# Target Specific Option Flags
OPTDEFS += RTR_NWK
OPTDEFS += ZDO_COORDINATOR
OPTDEFS += COORDINATOR_BINDING
# RC: this one is unique for RC2200DK HAL!
OPTDEFS += USE_RC2200DK
```

Modification of C files

We have tried to avoid modifying the original code, but the following two changes are required:

Modify Onboard.c, and the routine KBInit() in this way:

```
// "Keyboard" initialization
void KBInit( void )
{
  // Joystick interrupt is an input
  DDRE &= ~KEYS_INT;

#ifndef KB_INT
  _SavedKeys = 0;
#else
  // RC: single compiler -D switch to change between CC2420DB & RC2200DK.
  #ifdef USE_RC2200DK
     BUTTONS_INT_INIT();
     CLEAR_BUTTONS_INT();
     ENABLE_BUTTONS_INT();
  #else
     JOYSTICK_INT_INIT();
  #endif   // KB_INT
  //
  KBIntSetup( true );
#endif
}
```

Modify ZMain.c, and the routine zmain_ext_addr() in this way:

```
    // RC: distinction between CC2420 & RC2200DK.
    #ifdef USE_RC2200DK
    // Flash LED1 until user hits SW1
    while ( EVAL_SW1 != OnBoard_GetKeys() ) {
    #else
    // Flash LED1 until user hits SW5
    while ( EVAL_SW5 != OnBoard_GetKeys() ) {
    #endif
```

Acknowledgement

Great thanks to Morten Larsen at ACTE Norway for his input to this application note.

Document Revision History

Document Revision	Changes
1.0	First release
1.1	Design Update

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