The μracoli Source Package

REVISION HISTORY			
NUMBER	DATE	DESCRIPTION	NAME

Contents

1 Overview

This package contains the uracoli-source code.

- `src` Source code of radio and ioutil library.
- `wuart` The wireless UART application.
- `xmpl` Some example applications, that illustrate how to use the µracoli functions.
- `wibo` The wireless bootloader source code, host application and examples.
- `inc` The header files used by the source code.

In order to build the libraries and applications you need an installed AVR toolchain.

avr-gcc	AVR GCC C-compiler which we need to compile the libraries and the test examples
avr-binutils	Linker, Object File Converter, ..
avr-libc	Standard C library which provides a good set of C standard functions
avrdude	Tool to transfer the machine code (.hex files) via ISP or JTAG AVR interface to the internal Flash memory and/or EEPROM.
avr-gdb	GNU debugger to debug AVR programs
AVaRICE	This tool interfaces the AVR GNU debugger with the AVR JTAG interface which allows real in-circuit debugging

A detailed installation description is available at http://uracoli.nongnu.org/avrtools.html.

2 Compiling the Libraries

The libraries can be build with make. In order to get an overview, if your board is supported, type

```
make -C src/ list
```

The libraries for e.g. the "radiofaro" board, are build with the command:

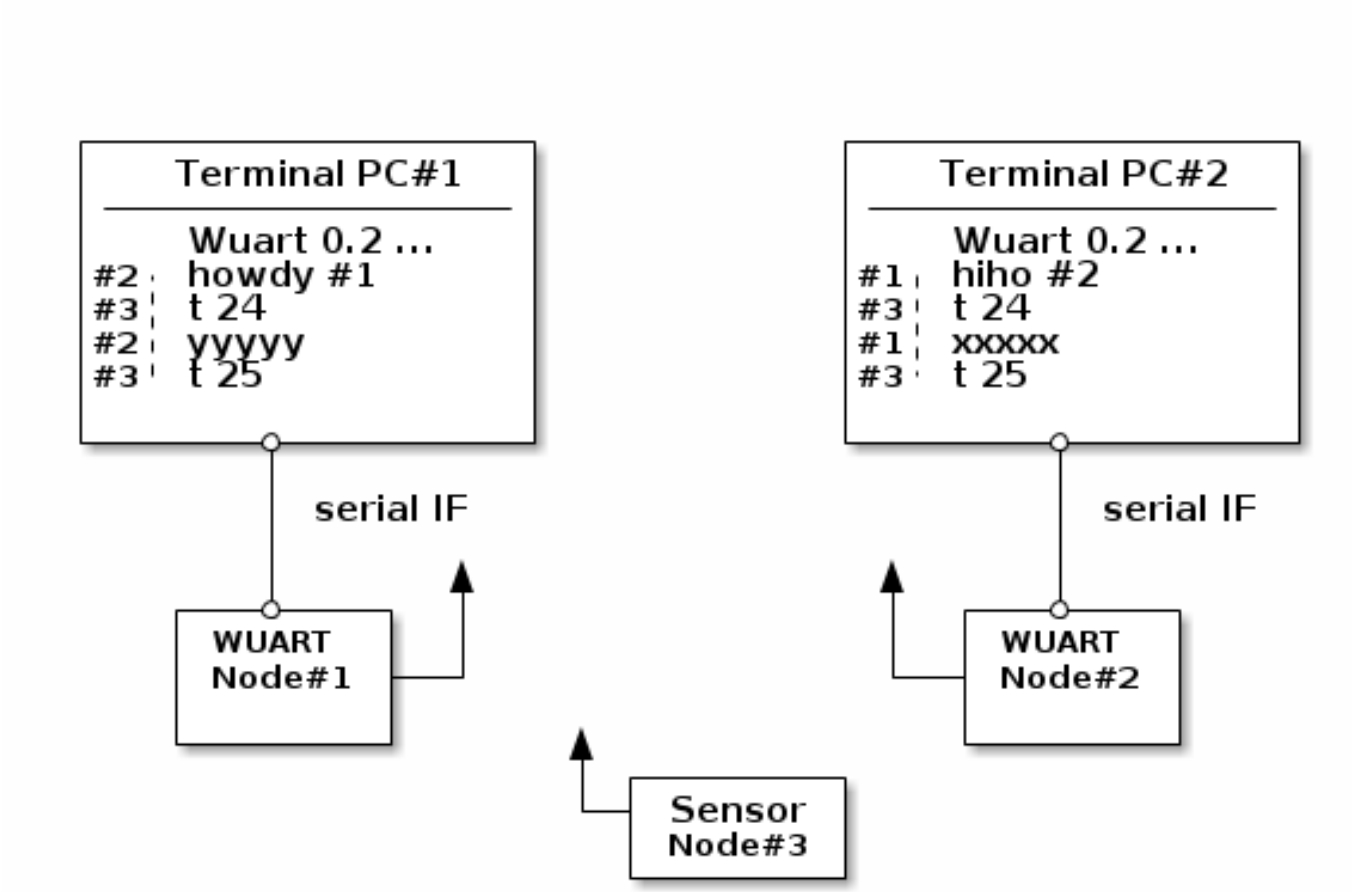
```
make -C src radiofaro
```

This will create the directory `lib` and the libraries for radiofaro.

```
$ls -1sh  lib/
216K lib/libio_radiofaro.a
324K lib/libradio_radiofaro.a
 36K lib/libwibohost_radiofaro.a
```

3 The Wireless UART

The wireless UART can be used to communicate between two PCs via a RF link, or to communicate between a PC and an autnomous sensor/actor node. The WUART application starts on a fixed channel and is automatically in the transparent data mode.



The wireless UART for the radiofaro board is build with the following commands:

```
make -C src radiofaro
make -C wuart radiofaro
```

The firmware file `wuart_radiofaro.hex` will be now available in the directoy `bin/`. It can be flashed in the microcontroller e.g. using an AVR Dragon programmer with the command:

```
avrdude -Pusb -cdragon_jtag -pm128rfa1 -U bin/wuart
```

Now open a serial terminal programm, adjust the baudrate, set the hardware handshake to *none* and after a reset of WUART node you will see a boot message, similiar to this:

```
Wuart 0.2 chan=17 radio 02.01
```

Do the same steps for a second board an try to chat between the terminal windows. Alternatively you can compile the example programm `xmpl_linbuf_tx.hex` and watch the text that appears in the terminal window of the PC.

```
make -C src anotherboard
make -C xmpl -f xmpl_linbuf_tx.mk anotherboard
```

4 The Examples

The example source code can be found in the directory `xmpl/`. This simple example programms are thought as starters for your application.

xmpl_leds.c	Example use of the LED macros
xmpl_key_events.c	Example for key event processing with a single key
xmpl_keys.c	Example use of the KEY macros
xmpl_hif.c	Example for use of the HIF functions
xmpl_hif_echo.c	Example that implements HIF echo, usefull to test the HIF troughput
xmpl_timer.c	Example for using the timer macros
xmpl_dbg.c	Example for use of the DBG_XXX macros
xmpl_linbuf_tx.c	Example use of the buffer functions
xmpl_trx_base.c	Example for accessing the transceiver
xmpl_trx_echo.c	Example for echoing received frames
xmpl_trx_rxaack.c	Example for receiving frames in rx_aack mode
xmpl_trx_rx.c	Example for receiving frames
xmpl_trx_txaret.c	Example for transmitting frames in tx_aret mode
xmpl_trx_tx.c	Example for transmitting frames
xmpl_radio_range.c	Example use of the radio and ioutil functions for a simple range test
xmpl_radio_stream.c	Example use of the radio stream functions

The example firmware can be build with the following commands:

```
make -C xmpl -f xmpl**.mk list
make -C src myboard
make -C xmpl -f xmpl**.mk myboard
```

Note: Some of the examples are not available on all boards, due to the lack of some hardware features, e.g. if the LEDs, the KEYs or/and the HIF is absent.

5 The Wireless Bootloader

How to use the wirless booloader is described in the file wino/README.txt or doc/wibo.pdf.