Quick Start RF Transceiver Evaluation Kit

1. Introduction

The RF Transceiver Evaluation Kit exists to provide familiarity with the functionality of Atmel®'s UHF ASK/FSK transceivers. For this purpose, software is included which enables the user to configure the registers easily and conveniently.

2. Kit Contents

The transceiver kit consists of a transceiver base station board, an SPI2LPT interface board, a DC supply cable, a parallel port cable, and a CD-ROM with the appropriate software, as depicted in Figure 2-1. The transceiver board and the SPI2LPT interface board have to be ordered separately.

Figure 2-1. Kit Contents

Quick Start RF Transceiver Evaluation Kit

Application Note

4888B–RKE–07/06

2.1 Transceiver Board

- Transceiver base station board
- Whip antenna
- BNC to SMB adapter

2.2 SPI2LPT Interface Board ATAB-SPI-LPT

- Interface board
- DC supply cable
- Parallel port cable
- CD-ROM *Transceiver S2L*
- CD-ROM *Products*

3. Hardware

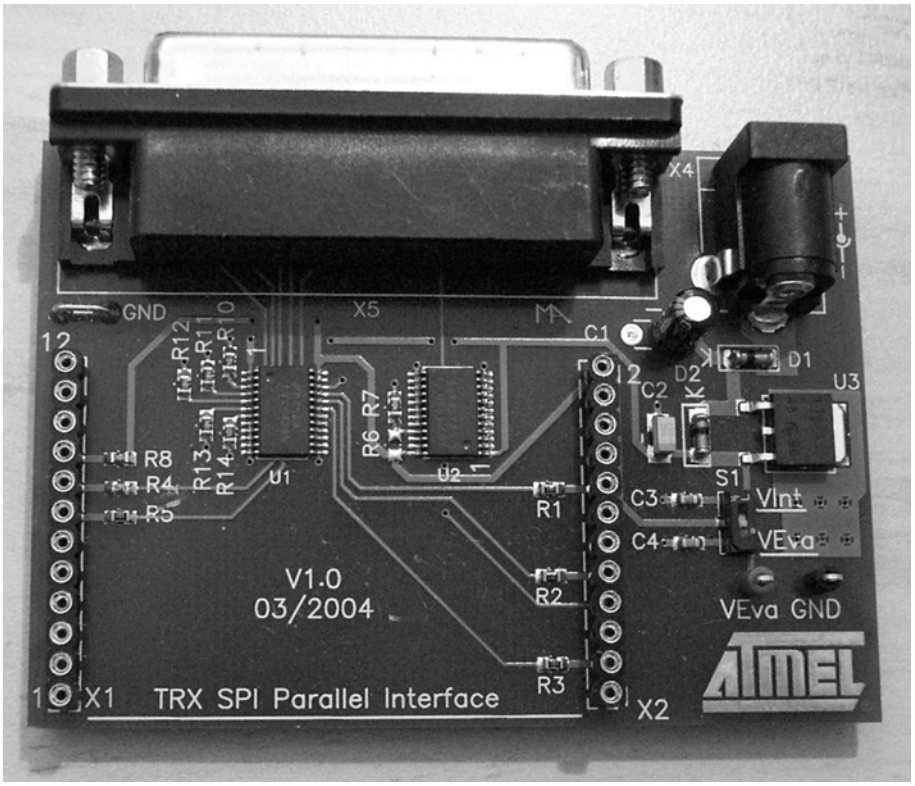
3.1 Transceiver Board

The transceiver base station board is available for different frequency ranges in high power mode, that is, with an RF output power of approximately 10 dBm at 50Ω. The different kit versions, transceiver board ordering codes, and SPI2LPT interface board ordering codes are in the selection guide, which can be found on the Atmel web site (**Products** -> **Automotive & Industrial** -> **Automotive Control** -> **Tools & Software**). Note that the transceiver board and the interface board have to be ordered separately.

3.2 Interface Board

The SPI2LPT interface board forms the connectivity between a parallel port of the PC and the SPI interface of the transceiver. Furthermore, a stable 5V supply voltage is generated by means of an on-board voltage regulator. Figure 3-1 shows the interface board and its building blocks.

Figure 3-1. Building Blocks of Interface Board



3.3 Connecting the Transceiver Kit

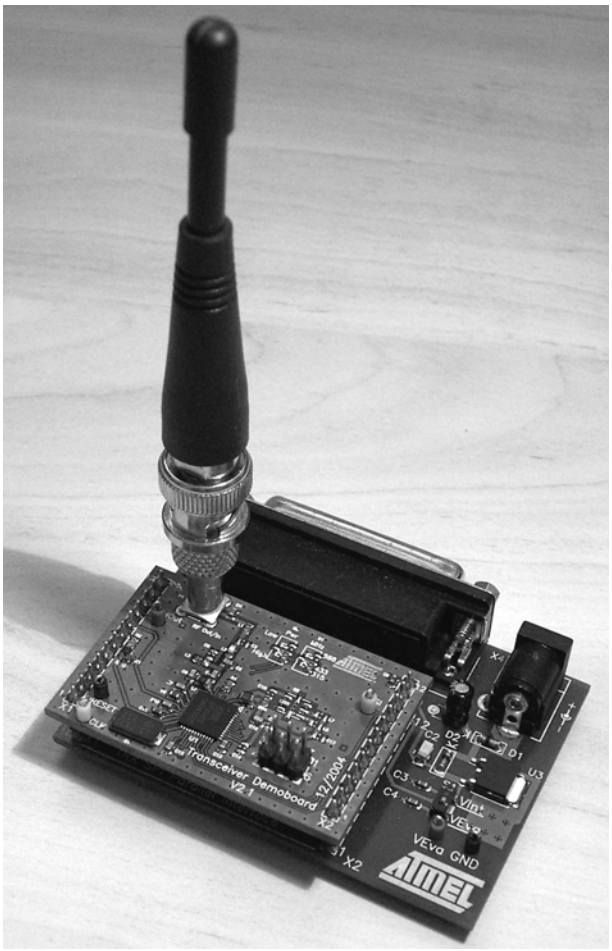
To ensure proper operation, the following steps should be carried out before starting the transceiver software:

1. Assemble the transceiver kit as shown in Figure 3-2.
2. Connect the parallel cable to an unused port of the PC.
3. Set switch *S1* to *VInt.*
4. Connect the DC power cable to a 12V power supply unit.
5. Switch on the 12V DC power supply.
6. Switch on the PC and boot into the operating system.

To measure the current of the transceiver itself, the procedure is as follows:

1. Assemble the transceiver kit as shown in Figure 3-2.
2. Connect the parallel cable to an unused port of the PC.
3. Set switch *S1* to *VEva.*
4. Connect 5V to pin VEva and the corresponding ground level to pin GND.
5. Connect the DC power cable to a 12V power supply unit.
6. Switch on the 12V DC power supply.
7. Switch on the PC and boot into the operating system.

Figure 3-2. Assembly of the Kit



4. Software

4.1 Installation

On the CD-ROM there are different versions *setup.exe* for the different supported evaluation boards. Go to the appropriate directory on the CD-ROM (for example, ATAB5811_12) for the evaluation board in use and run that *setup.exe* to install the transceiver software. To use the parallel port, the driver *pport.exe* must be installed.

4.2 Getting Started

1. Start the transceiver software.
2. Under **Options** -> **XTAL Frequencies**, select the appropriate crystal frequency according to Table 4-1.

Table 4-1. Crystal Frequencies

RF Frequency [MHz]	Crystal Frequency [MHz]
315	12.7319
433.92	13.2531
868.3	13.4119
915	14.1332

3. Choose **Setup** -> **Transfer Rate** and set the fastest supported value.
4. Select the connected port under **Setup** -> **Parallel Port**.
5. Under **File** -> **Load Settings**, four sample settings are predefined. For example, if **433.92MHZ_RX-MODE_FSK_2.4KBIT/S** is selected, a configuration for receiving polling mode with FSK modulation and a data rate of 2.4 kBits/s is loaded. If **433.92MHZ_TX-MODE_FSK_2.4KBIT/S** is selected, the appropriate configuration for transmit mode with FSK modulation and a data rate of 2.4 kBits/s is loaded. **LIM_MIN** sets the **TX_BAUDRATE**. Clicking **WRITE ALL** starts the PLL running, but the PA remains off.

In receiving polling mode, the integrated logic searches periodically for a valid transmitter signal. In the presence of a valid signal, the transceiver switches to permanent receiving mode and the data is received.

Depending on the configuration of the transceiver, the data stream is stored in the integrated TX/RX data buffer or is available on pin SDO_TMDO.

If the status register is read in buffered mode, the number of received bytes is shown as the counter value in the TX/RX buffer window. Clicking **READ** displays the received data stream in the TX/RX buffer window.

In transmit mode, the data can be sent using the TX/RX data buffer, or the data stream can be applied on pin SDI_TMDI.

To use the TX/RX data buffer, the following steps have to be carried out:

- Set the data stream bit-by-bit including a preburst and a start bit.
- Press **WRITE** to send the data. After the data is sent, a continuous carrier is emitted.
- Set the transceiver back to the desired mode using the control register **CREG1**.

Further details on the different settings, operation modes, flowcharts, etc. are described in the datasheet.

Atmel Corporation

2325 Orchard Parkway
San Jose, CA 95131, USA
Tel: 1(408) 441-0311
Fax: 1(408) 487-2600

Regional Headquarters

Europe
Atmel Sarl
Route des Arsenaux 41
Case Postale 80
CH-1705 Fribourg
Switzerland
Tel: (41) 26-426-5555
Fax: (41) 26-426-5500

Asia
Room 1219
Chinachem Golden Plaza
77 Mody Road Tsimshatsui
East Kowloon
Hong Kong
Tel: (852) 2721-9778
Fax: (852) 2722-1369

Japan
9F, Tonetsu Shinkawa Bldg.
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
Japan
Tel: (81) 3-3523-3551
Fax: (81) 3-3523-7581

Atmel Operations

Memory
2325 Orchard Parkway
San Jose, CA 95131, USA
Tel: 1(408) 441-0311
Fax: 1(408) 436-4314

Microcontrollers
2325 Orchard Parkway
San Jose, CA 95131, USA
Tel: 1(408) 441-0311
Fax: 1(408) 436-4314

La Chantrerie
BP 70602
44306 Nantes Cedex 3, France
Tel: (33) 2-40-18-18-18
Fax: (33) 2-40-18-19-60

ASIC/ASSP/Smart Cards
Zone Industrielle
13106 Rousset Cedex, France
Tel: (33) 4-42-53-60-00
Fax: (33) 4-42-53-60-01

1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906, USA
Tel: 1(719) 576-3300
Fax: 1(719) 540-1759

Scottish Enterprise Technology Park
Maxwell Building
East Kilbride G75 0QR, Scotland
Tel: (44) 1355-803-000
Fax: (44) 1355-242-743

RF/Automotive
Theresienstrasse 2
Postfach 3535
74025 Heilbronn, Germany
Tel: (49) 71-31-67-0
Fax: (49) 71-31-67-2340

1150 East Cheyenne Mtn. Blvd.
Colorado Springs, CO 80906, USA
Tel: 1(719) 576-3300
Fax: 1(719) 540-1759

Biometrics/Imaging/Hi-Rel MPU/
High-Speed Converters/RF Datacom
Avenue de Rochepleine
BP 123
38521 Saint-Egreve Cedex, France
Tel: (33) 4-76-58-30-00
Fax: (33) 4-76-58-34-80

Literature Requests
www.atmel.com/literature