

***REXENSE***

**Standard Development Board**

DEV10

ZHEJIANG REXENSE TECHNOLOGY CO., LTD.

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## Version History

V1.0.0 2011/06/04 1st issue of preliminary document  
V1.2.2 2011/09/23 Added content of standard JTAG

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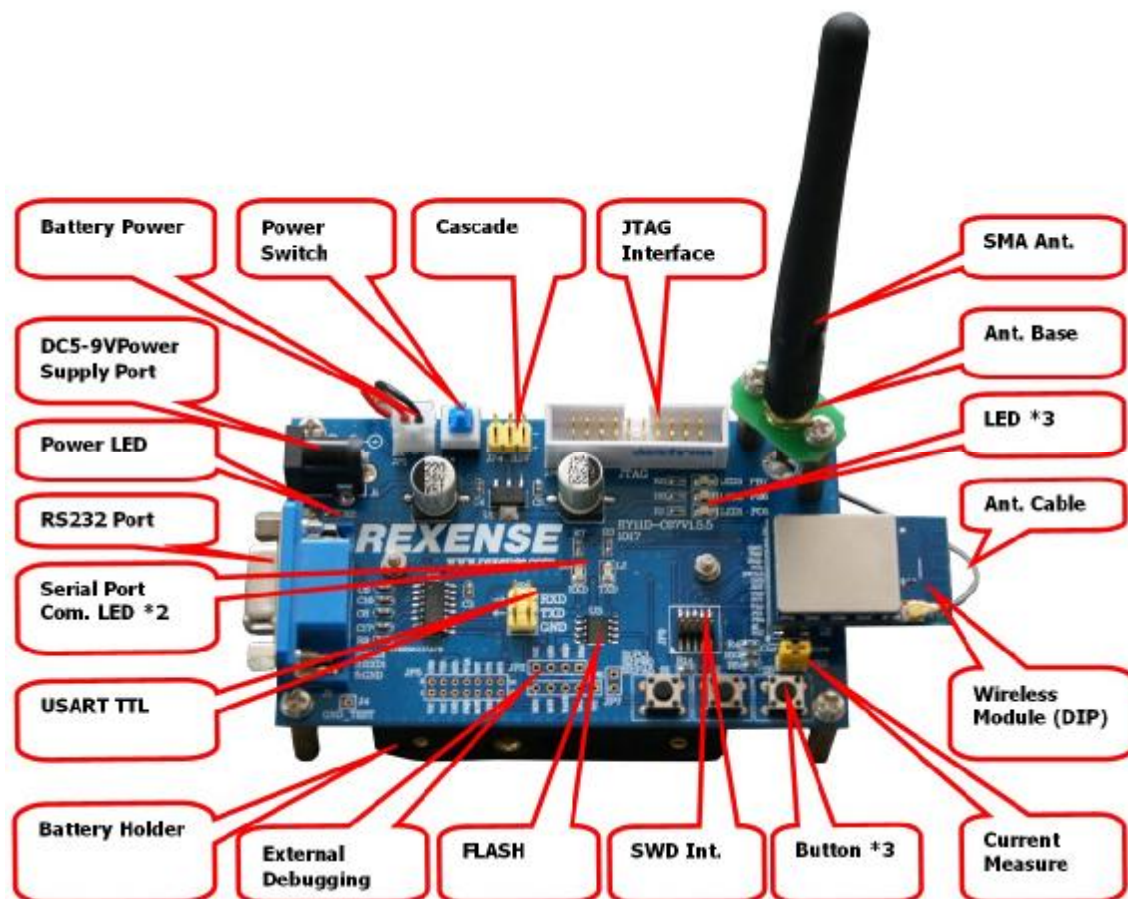
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## 1. Overview

REXENSE standard development board (DEV10) simulates real application environment to help users develop your own application firmware and test the network performance. DEV10 is equipped with multiple program downloading / debugging interfaces (J-TAG, SWD, PTI), a serial communication interface (UART), and other necessary communication and testing interfaces for developers. With DEV10, developers can complete the software development / debugging of REX2 and REX3 wireless communication modules and the testing of the hardware and peripherals for wireless communication.

## 2. Components and Descriptions



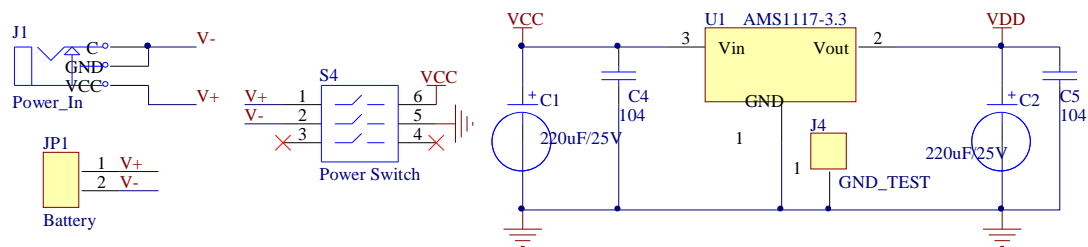
Components	Descriptions
DC5-9V Power Supply Port J1	External DC Power supply port, supply voltage from DC5V-9V. (Center positive)
Battery Power Supply Port JP1	Battery power supply port with 6-9V group battery.
Power Switch S4	Power switch (press=on ; release=off)
Cascade Port JP4	Up to 3 standard DEV boards are able to be powered via the cascade port.
JTAG Interface	Standard JTAG interface for simulating, debugging and program downloading.
SMA Antenna (Base)	SMA antenna & external antenna base
Connecting Cable	U.FL/SMA antenna connecting cable
LED *3	3 LEDs controlled by different I/Os. The LED will be ON if the I/O is pulled low while it will be OFF if the I/O is pulled high. LED1: PC6 LED2: PB6 LED3: PB7
Wireless Module	Wireless modules (DIP package) can be connected to the DEV board. Now two types of modules (ZigBee and Sub-1GHz) are supported, and the pin of ZigBee and Sub-1GHz modules are compatible.  <b>* To ensure better communication performance, the module should be installed as that in the above picture.</b>
Current Measure	The operating current of the module can be measured via this interface.
Button *3	3 independent buttons control different I/O. When S1 is pressed down, PC1 will be pulled high, while S1 is released, PC1 will be pulled low. When S2 is pressed down, PB0 will be pulled high, while S2 is released, PB0 will be pulled low. When S3 is pressed down, PA5 will be pulled high, while S3 is released, PA5 will be pulled low.
SWD Interface	SWD interface, supporting SWD and Ember's PTI debugging interface protocol.
FLASH	1M serial FLASH (model No. M25P10-A) for data storage.
External Debugging	External debugging interface for external device

Components	Descriptions
Interface	debugging.
USART ( TTL Level )	USART ( TTL Level ) of the wireless module.
Serial Port Communication LED	Serial port communication LED indicator; the LED flashes when there is data in communication. L2: TXD L3: RXD
RS232 Interface	RS232 interface (DB 9 connector), USART of the wireless module can communicate with PC via SP3223.
Power LED	LED of 3.3V system power supply

## 3. Function Definition

### 3.1. Power supply circuit

The standard DEV board provides users with two types of power supply with power switch.

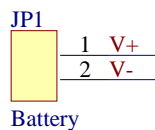


External DC Power supply port (J1), supply voltage from DC5V-9V. (Center positive)

#### External power supply port (Battery holder)



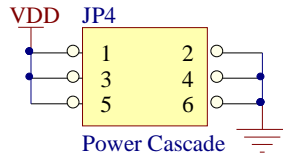
The DEV board supports battery power supply with 6-9V group battery. The interface is defined as follows:



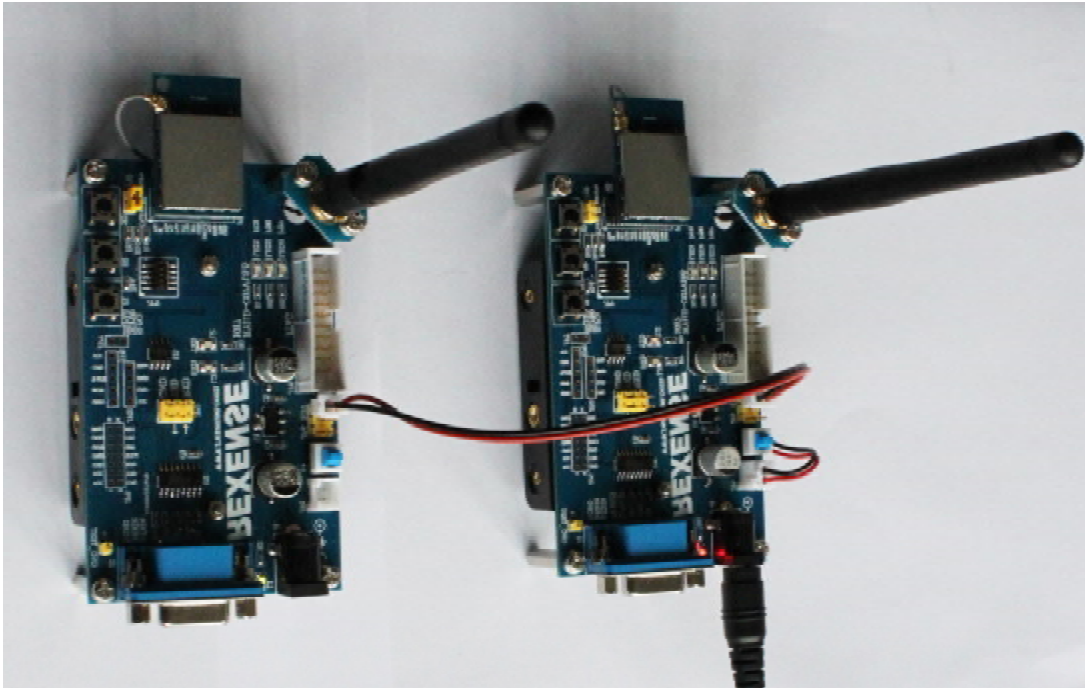
Pin No.	Descriptions
1	Power (positive)
2	Power (negative)

**Remarks:** The use of DC power supply is prohibited if the battery power supply is in use.

## 3.2. Cascade Port



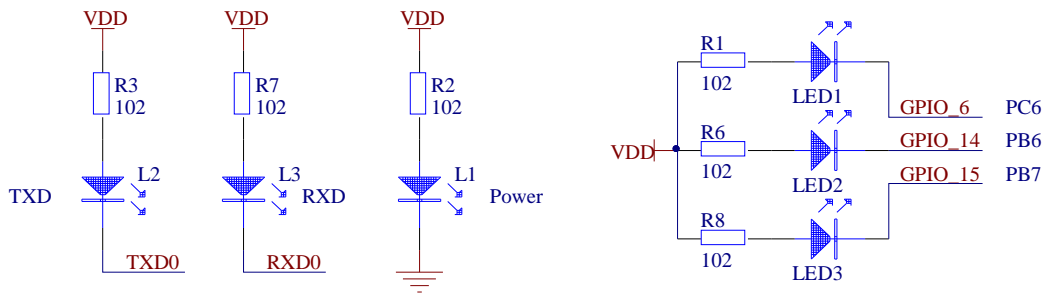
The DEV board is equipped with a cascade interface with which up to 3 DEV boards can be powered through only one power supply. Please watch for the polarity when you use the cascade interface.



## 3.3. LED Indicating Circuit

The DEV board provides LED indicating circuit, which includes power LED, serial port TX/RX LED, I/O driving LEDs.

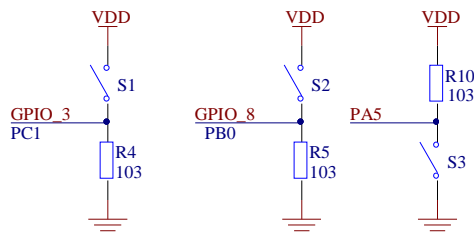




- I L1: 3.3V power supply LED. It turns On when 3.3V mains input is detected.
- I L2、L3: Serial port TX/RX LED. The LED flashes if there is data in communication in the serial port.
- I LED1 - LED3: As shown in the figure, the LEDs are connected to the corresponding pins of the wireless module. The LEDs will turn on if low level output is detected.

## 3.4. Button Circuit

The DEV board is equipped with three separate buttons for input detection. Three buttons are controlled by PC1, PB0 and PA5 respectively.



- I S1: Connected to PC1 of the module, which is pulled low by default and pulled high when S1 is pressed down.
- I S2: Connected to IRQA (PB0) of the module, which is pulled low by default and pulled high when S2 is pressed down.
- I S3: Connected to PA5 of the module, which is pulled low by default and pulled high when S2 is pressed down.

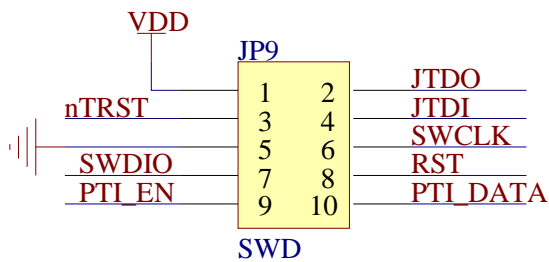
## 3.5. RS232 Circuit

The DEV board provides users with a RS232 port (DB9 connector), through which the USART of the wireless module can communicate with PC. The pins are defined as follows:



## 3.7. SWD Interface

The DEV board provides users with a SWD interface, support SWD and Ember's PTI debugging protocol.

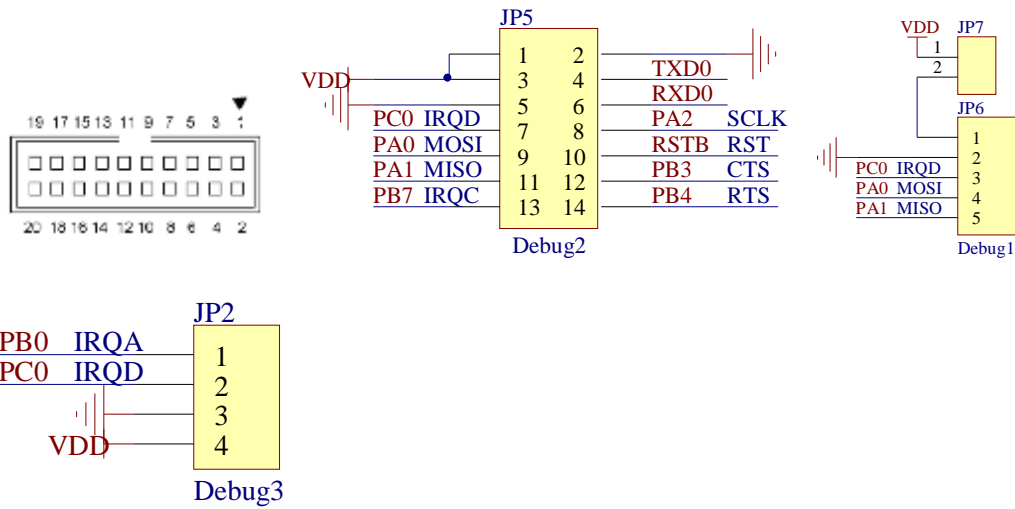


Apart from SWD, JTAG is also included. Users are able to do the debugging with adapting board through JTAG. The SWD interface uses 5\*2 DIP package (spacing=1.27mm). Pins are defined as follows:

Pin No.	Description
1	VCC
2	JTDO (JTAG function)
3	nTRST (JTAG)
4	JTDI (JTAG function)
5	GND
6	SWCLK
7	SWDIO
8	ZigBee_RST
9	PTI_EN (for Ember module only)
10	PTI_DATA (for Ember module only)

## 3.8. External Debugging Interface

The DEV board is equipped with external interfaces for the debugging with external devices.



## 3.9. SMA Antenna Base

The DEV board is equipped with a SMA antenna base, on which SMA antenna can be installed to enhance the communication performance.

## 3.10. JTAG Interface

The DEV board provides users with a standard (spacing=2.54mm) 20-pin interface, via which you can burn your own firmware and application software with ARM simulator.

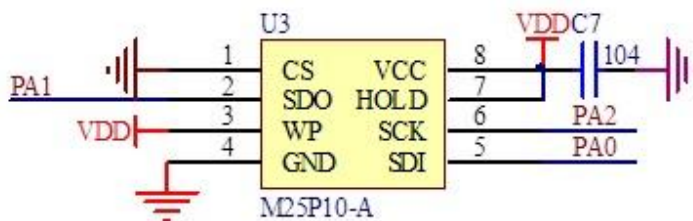
JTAG Interface defined as follows:

Pin	Descriptions	Pin	Descriptions
1	VDD_3.3V	2	VDD_3.3V
3	JNTRST	4	GND
5	JTDI	6	GND
7	JTMS	8	GND
9	JTCK	10	GND
11	NC	12	GND

13	JTDO	14	GND
15	RESET	16	GND
17	NC	18	GND
19	NC	20	GND

### 3.11. FLASH Circuit

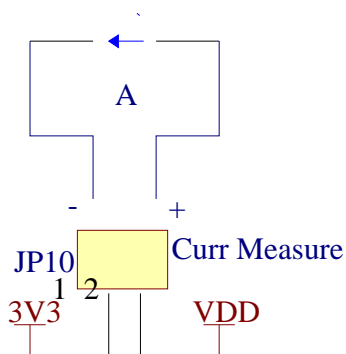
The DEV board is equipped with a 1M serial Flash (model No. :M25P10-A) for data recording and storage.



FLASH Pin	Module Pin
SDO (data output)	PA1
SDI (data input)	PA0
SCK (clock)	PA2

### 3.12. Current Measure Circuit

To measure the consumption of the wireless module, the DEV board provides with the function of current measure. Users are able to measure the operating current of the wireless module with a multimeter.



**Note:** Please short circuit JP10 by a jumper to ensure the normal power supply of the wireless module during normal use.

## 3.13. Oscilloscope Grounding

