



## Universal EXTension connector (UEXT)

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## What is UEXT?

Back in year 2000 we start to design different development boards, there were many features which we wanted to implement to all boards like wireless communication, Relay output, opto-isolated inputs, Audio, RS485 etc, but we realized that not all customers will need all these features at once, so why to put all this on every board and customer pay for all features but use only few? For instance one will need Zigbee, other will need Bluetooth, we asked ourself how to make our boards so everyone is happy but to not make the boards unnecessary expensive? Then we start thinking for some kind of universal connector where we know which pin where is connected and we can develop different modules which to connect to this connector and to be available to every board.

Every decent microcontroller have **RS232**, **SPI** and **I2C**, these are basic peripherals and they give quite good freedom to develop different modules.

This is how UEXT (Universal-Extension-Connector) was born. We start including this connector on every one of our boards which we designed after year 2004.

To summarize: UEXT is a [board to board](#) connector which supports three serial communication interfaces I<sup>2</sup>C, SPI and RS232. It is a great way to add features to the development boards so customer can choose which feature he want to use.

## Physical characteristics:

For the physical connector of UEXT interface we choose dual row [BH10S](#) male connector, 10 pins (two rows x 5) with row spacing 0.100" (2.54 mm). These are very common and cheap so can be sourced from many different sources.

As UEXT have RS232 and the Rx and Tx signals should be crossed we can say that UEXT on the board is with HOST and UEXT on the module is with SLAVE layout

With UEXT on board you can connect any of our Modules which are listed below and to add different functionality.

UEXT host is 10 pin MALE connector, the modules may be 10 pin Female connector if plug directly to the host UEXT or can be made also with Male 10 pin connector if they are to be connected with 10 pin Ribbon IDC10 cable

## Electrical characteristics:

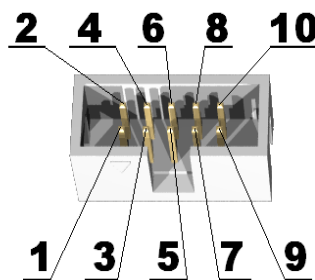
The UEXT connector gives user an opportunity to connect different modules to the host via I<sup>2</sup>C, SPI and RS232 interfaces with CMOS levels. The interface you will use depends on the module supported interface.

If you don't use the special function of some pins then they are used as GPIO's.

Note that some of UEXT interfaces may be shared with other peripheral of the host. For example host's UEXT SPI interface can be shared at other chip select with on board LCD, SD/MMC card etc.

### Connector pins description:

Pin #	Signal Name
1	3.3V
2	GND
3	TXD
4	RXD
5	SCL
6	SDA
7	MISO
8	MOSI
9	SCK
10	SSEL



- If you use RS232 interface of host's UEXT, then RXD is an input and TXD is an output.

- If you use SPI interface of host's UEXT, then the host is a master and the module is slave, i.e. MISO is an input and MOSI is an output.

- The I<sup>2</sup>C signals (SDA and SCL) of host's UEXT are pulled-up with resistors

## OLIMEX Modules with UEXT:

Now we have lot of modules developed and many new are to come.

### Wireless:

MOD-NRF24L - this is 2.4Ghz module with nordic nRF24L01  
MOD-BT - bluetooth module with NXP BGB203  
MOD-BLECC2540 - bluetooth low energy module with CC2540  
MOD-nRF8001 - bluetooth low energy module with nrf8001  
MOD-MRF24J40 - Microchip's IEEE 802.15.4™ Standard compliant 2.4 GHz RF module with SPI interface allow boards to connect to Zigbee networks  
MOD-WIFI - board with ZG2100M Wi-Fi module with SPI interface, allow boards to connect to WiFi internet  
MOD-ZIGBEE-UEXT - Microchip's MRF24J60 RF module + Zigbee stack implemented on PIC  
MOD-GSM - Quad band GSM module with SIM340DZ  
MOD-GSM-EDGE - Quad band GSM module with SIM700 and 236Kbps  
MOD-CCRF - 868/915 RF transceiver with CC430F5137  
MOD-CCRFLCD - 868/915 RF transceiver with CC430F5137 with temperature sensor and LCD  
MOD-HRF2.4 - low cost RFM70 2.4GHz RF module

### Ethernet:

MOD-ENC28J60 - Ethernet with ENC28J60 10 Mbit  
MOD-ENC624J600 - Ethernet with ENC624J600 100 Mbit

### RFID:

MOD-RFID125-BOX - 125 kHz RFID reader  
MOD-RFID1356-BOX - 13.56 Mhz RFID reader

### LCD:

MOD-NOKIA6610 - nokia 6610 LCD  
MOD-NOKIA3310 - nokia 3310 LCD  
MOD-LCD1x9 - 9 alphanumeric character LCD  
MOD-LCD4.3" - 4.3"LCD with LPC2478

### IO:

MOD-IO - addressable and stackable 4 relays, 4 optoisolated inputs module  
MOD-AD - 24 bit ADC and DAC module  
MOD-USB-RS232 - USB to UEXT convertor can act as host and slave and allow any of our modules or board with UEXT to be connected to PC via USB  
MOD-RS485 - RS485 converter  
MOD-SD-MMC- allow modules which can be placed on MMC card to be interfaced  
MOD-IRDA - reads IR and sends IR commands (demo with MOD-USB-RS232 takes IR remote TV controller and act as HID keyboard)

MOD-HDPMT - measures pressure and magnetic compass  
MOD-HRH - measures RH

**Navigation:**

MOD-GPS - SirfstarIII low power GPS module  
MOD-SMB380 - digital 3 axes accelerometer  
MOD-MAG - digital 3 axes magnetometer

**Bio-feedback:**

MOD-EKG - EKG heartbeat sensor module  
MOD-PULS - pulseoximeter and heart-rate monitor

**Audio:**

MOD-MP3-X - VS1053 MP3 player controllable through RS232 commands easy  
embedd voice/music to your project

**Power:**

MOD-PWRMTR Google power metering add-on board  
MOD-PWRLN power line network modem

## FAQ:

**Q: Can I implement UEXT on my own board?**

A: Absolutely, we encourage anyone to implement UEXT to their products, but to follow the host/slave and electrical layouts.

**Q: Is UEXT for only 3.3V modules?**

A: yes, UEXT is designed for 3.3V and most of our modules will be destroyed if more than 3.3V is applied

**Q: Is there power supply restriction for the 3.3V host?**

A: we never defined power consumption, but we have many different boards with capability to supply from 100 to 500mA, so the host power supply capabilities depend on the board implementation. If you want to develop your UEXT modules do not make them more than 100mA power hungry as they may not work with all of our boards

**Q: Should I pay royalties or taxes to Olimex if I use or develop UEXT modules?**

A: No, this is open project and there are no taxes nor royalties to use UEXT

**Revision history:**

initial revision

Rev. A, September 2011

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