Future Technology Devices International Ltd
Datasheet
UMFT200XD Breakout Modules

UMFT200XD is a USB to I^{2}C breakout module

1 Introduction

The UMFT200XD breakout module utilizes FTDI's FT200XD IC to convert USB to an I^{2}C.

1.1 Features

The UMFT200XD is a breakout board that converts USB2.0 Full-Speed to I^{2}C. These modules do not have a USB connector; instead the modules plug directly into the USB host connector and the pads of the PCB makes electrical contact with the electrical contacts of the USB connector.

The I^{2}C interface operates at +3.3V voltage levels, however all I/Os are 5V tolerant.

1.2 Ordering Information

Module	Interface	Features
UMFT200XD	I^{2}C	USB to I^{2}C with four control bus lines, 3.3V power out limited to 50mA and 5V with as safety fuse. I^{2}C signals available via 8 pin female connector.
UMFT200XD-NC	I^{2}C	USB to I^{2}C with four control bus lines, 3.3V power out limited to 50mA and 5V with as safety fuse. I^{2}C signals available via 8 pads on the PCB
UMFT200XD-WE	I^{2}C	USB to I^{2}C with four control bus lines, 3.3V power out limited to 50mA and 5V with as safety fuse. I^{2}C signals available via 8, 6" flying leads connected to the PCB pads.

2 Driver Support

Royalty-Free VIRTUAL COM PORT (VCP) DRIVERS for:

- Windows 7 32,64-bit
- Windows Vista
- Windows XP 32,64-bit
- Windows XP Embedded
- Windows CE.NET 4.2 , 5.0 and 6.0
- MAC OS OS-X
- Linux 3.0 and greater
- Android

Royalty-Free D2XX Direct Drivers (USB Drivers + DLL S/W Interface):

- Windows 7 32,64-bit
- Windows Vista
- Windows XP 32,64-bit
- Windows XP Embedded
- Windows CE.NET 4.2, 5.0 and 6.0
- MAC OS OS-X
- Linux 3.0and greater
- Android

The drivers listed above are all available to download for free from www.ftdichip.com. Various 3rd Party Drivers are also available for various other operating systems - visit www.ftdichip.com for details.

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3 UMFT200XD Signals and Configurations

CN1 connects directly to a USB host or HUB port, or can be connected to a USB extension cable. This connects to USB signals, 5V USB Bus power and GND. When connecting the module to a USB host or HUB the signal pads should be facing upwards when connecting to a horizontal connector and be facing right for vertical connectors. If the module is plugged in upside down no connectivity will be made between PCB and HUB, no damage will occur from plugging the module in the wrong way.

3.1 UMFT200XD CN1 Signal Descriptions

Pin No.	Name	Type	Description
1	VBUS	PWR	5V Power input USB port. For a low power USB bus powered design, up to 100mA can be sourced from the 5V supply on the USB bus. A maximum of 500mA can be sourced from the USB bus in a high power USB bus powered design.
2	D-	Signal	Negative USB data signal
3	D+	Signal	Positive USB data signal
4	GND	PWR	Module Ground

Table 3.1 USB Connector Pin Out Description

3.2 UMFT200XD CN2 Signal Descriptions

Pin No.	Name	Type	Description
1	SCL	Input	I^2C clock input
2	VBUS	PWR Output	5V Power output USB port.
3	GND	PWR	Module Ground Supply
4	RST#	Input	Can be used by an external device to reset the FT201X.
5	SDA	I/O	I^2C bi-directional data line
6	3V3	Output	3.3V output from FT200XD integrated LDO regulator. This pin is decoupled to ground on the module PCB with a 10nF capacitor that offers 3V3 at up to 50mA for external hardware.
7	CB0	I/O	Configurable CBUS0 I/O Pin. Function of this pin is configured in the device internal MTP ROM. See CBUS Signal Options, Table 3.3
8	GND	PWR	Module Ground Supply

Table 3.2 I^2C Module Pin Out Description

3.3 CBUS Signal Options

CBUS Signal Option	Available On CBUS Pin	Description
Tristate	CBUS0	IO Pad is tristated
DRIVE_1	CBUS0	Output a constant 1
DRIVE_0	CBUS0	Output a constant 0
PWREN#	CBUS0	Output is low after the device has been configured by USB, then high during USB suspend mode. This output can be used to control power to external logic P-Channel logic level MOSFET switch. Internal drive configuration consists of an open drain to GND with no pull-up, specially designed for battery charging applications.*
TXLED#	CBUS0	Transmit data LED drive – pulses low when transmitting data via USB.
RXLED#	CBUS0	Receive data LED drive – pulses low when receiving data via USB.
TX&RXLED#	CBUS0	LED drive – pulses low when transmitting or receiving data via USB.
SLEEP#	CBUS0	Goes low during USB suspend mode. Typically used to power down an external TTL to RS232 level converter IC in USB to RS232 converter designs.
CLK24MHz	CBUS0	24 MHz Clock output.**
CLK12MHz	CBUS0	12 MHz Clock output.**
CLK6MHz	CBUS0	6 MHz Clock output.**
GPIO	CBUS0	CBUS bit bang mode option. A separate application note, AN232R-01, available from FTDI website (www.ftdichip.com) describes in more detail how to use CBUS bit bang mode.
BCD_Charger	CBUS0	Battery charge Detect, indicates when the device is connected to a dedicated battery charger host. Active high output.
BCD_Charger#	CBUS0	Inverse of BCD Charger
BitBang_WR#	CBUS0	Synchronous and asynchronous bit bang mode WR# strobe output.
BitBang_RD#	CBUS0	Synchronous and asynchronous bit bang mode RD# strobe output.
I2C_TXE#	CBUS0	Transmit buffer empty, used to indicate to I2C master device status of the FT200XD transmit buffer
I2C_RXF#	CBUS0	Receive buffer full, used to indicate to I2C master device status of FT200XD receive buffer
VBUS_Sense	CBUS0	Input to detect when VBUS is present.
Time_Stamp	CBUS0	Toggle signal which changes state each time a USB SOF is received
Keep_Awake#	CBUS0	Active Low input, prevents the chip from going into suspend.

Table 3.3 CBUS Configuration Control

* PWREN# must be used with a 10kΩ resistor pull up.

**When in USB suspend mode the outputs clocks are also suspended.

3.4 Configuring the MTP ROM

The FT200XD IC on the module contains an embedded MTP ROM, this can be used to specify the functions of the CBUS0 pin, the current drive on each signal pin, current limit for the USB bus and the descriptors of the device. These features can be programmed using FTDI's programming utility FT_Prog. For details on using FT_Prog, please see the FT_PROG User Guide.

When programming the MTP ROM please note:

i) The Max Bus Power setting of the MTP ROM should specify the maximum current to be drawn from the USB host/hub when enumerated. For high-powered USB devices the current limit when enumerated is between 100mA and 500mA, for low-powered USB devices the current limit is 100mA.

4 Module Dimensions
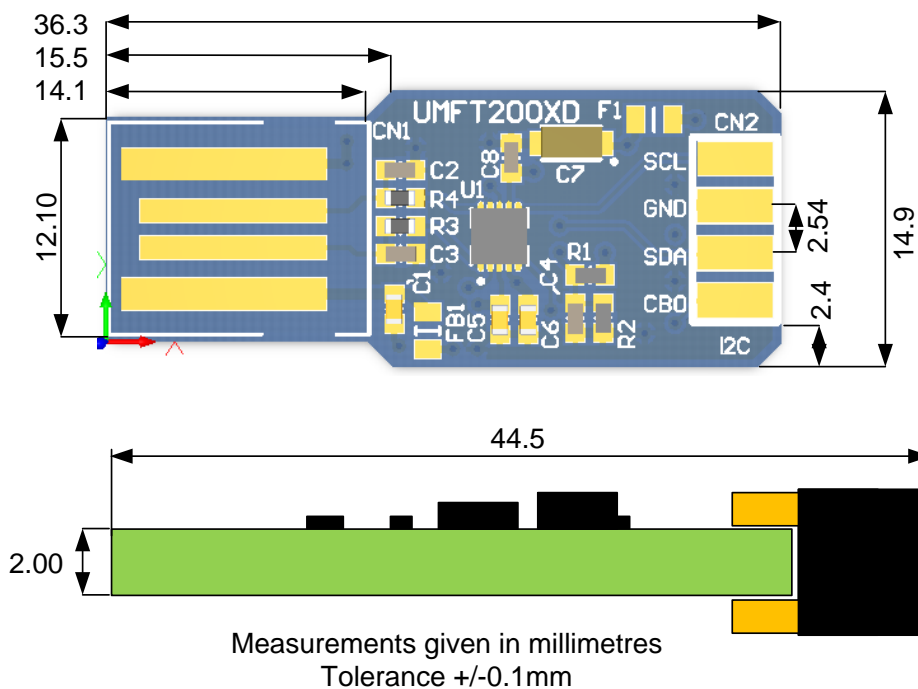
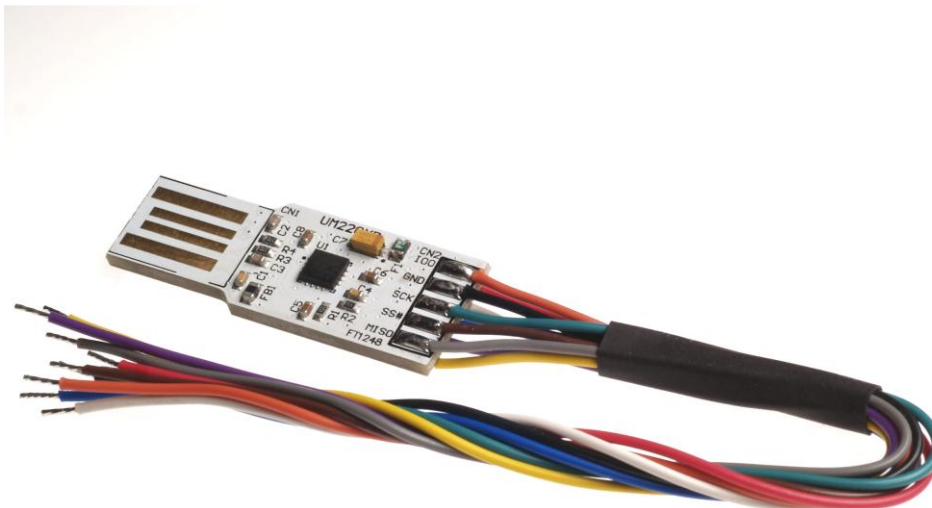**Figure 4.1 UMFT200XD-01 Module Dimensions**

5 Module Wire Connections

5.1 UMFT200XD-WE Wire Connections
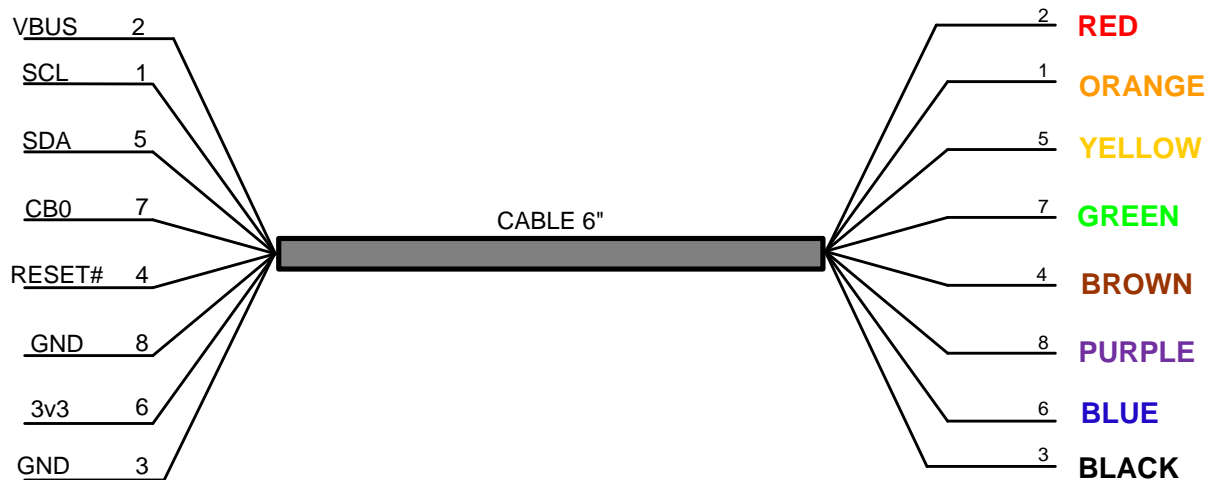
Figure 5.1 UMFT200XD-WE Wire Connections (numbers refer to pad numbers on the PCB)

Figure 5.1 illustrates the –WE product as a cable. This is only for illustration purposes. The wire ended product consists of individual wires – not a cable
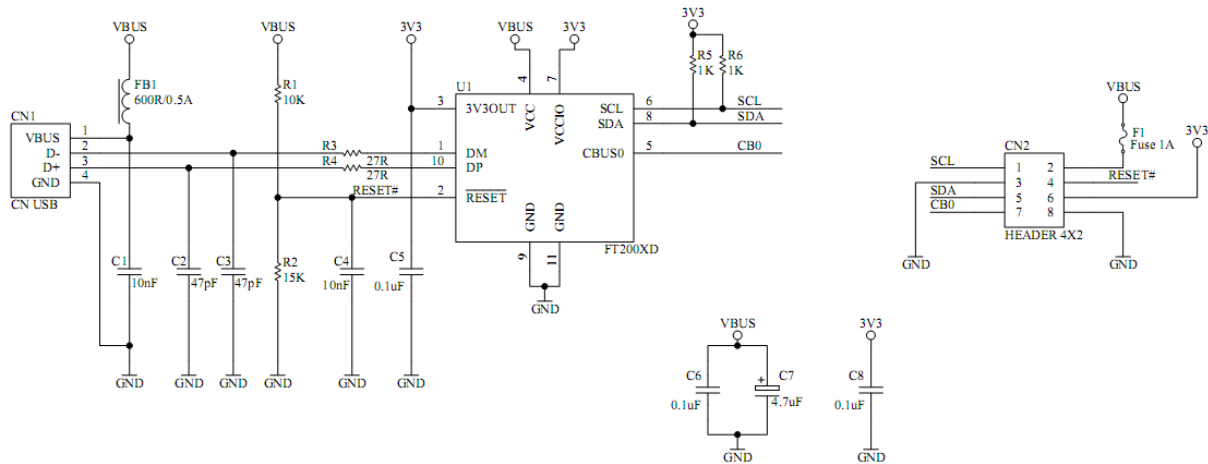
5.2 UMFT200XD-WE

Figure 5.2 UMFT200XD-WE Image

6 Module Circuit Schematic

6.1 UMFT200XD Schematic

Figure 6.1 UMFT200XD Circuit Schematic

7 Environmental Compliances

The UMFT200XD modules exclusively use lead free components, and are fully compliant with European Union directive 2002/95/EC.

8 Internal MTP ROM Configuration

Following a power-on reset or a USB reset the FT200XD will scan its internal MTP ROM and read the USB configuration descriptors stored there. The default values programmed into the internal MTP ROM in the FT200XD used on the UMFT200XD are shown in Table 8.1.

Parameter	Value	Notes
USB Vendor ID (VID)	0403h	FTDI default VID (hex)
USB Product UD (PID)	6015h	FTDI default PID (hex)
Serial Number Enabled?	Yes	
Serial Number	See Note	A unique serial number is generated and programmed into the MTP ROM during final test of the UMFT200XD-01 module.
Pull down I/O Pins in USB Suspend	Disabled	Enabling this option will make the device pull down on the UART interface lines when the power is shut off (PWREN# is high).
Manufacturer Name	FTDI	
Product Description	UMFT200XD	
Max Bus Power Current	90mA	
Power Source	Bus Powered	
Device Type	FT200DX	FT200DX = 0x03
USB Version	0200	Returns USB 2.0 device description to the host. Note: The device is a USB 2.0 Full Speed device (12Mb/s).
Remote Wake Up	Enabled	Taking RI# low will wake up the USB host controller from suspend.
High Current I/Os	Disabled	Enables the high drive level on the serial and CBUS I/O pins.
Load VCP Driver	Enabled	Makes the device load the VCP driver interface for the device.
CBUS0	GPIO	

Table 8.1 Default Internal MTP ROM Configuration

The internal MTP ROM in the FT200X can be programmed over USB using the utility program FT_PROG. FT_PROG can be downloaded from the www.ftdichip.com. Users who do not have their own USB vendor ID but who would like to use a unique Product ID in their design can apply to FTDI for a free block of unique PIDs. Contact FTDI Support (support1@ftdichip.com) for this service.

9 Contact Information

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Distributor and Sales Representatives

Please visit the Sales Network page of the FTDI Web site for the contact details of our distributor(s) and sales representative(s) in your country.

Appendix A – List of Figures and Tables

Appendix B: Revision History

Document Title: UMFT200XD
Document Reference No.:   FT_000543
Clearance No.:   FTDI# 274
Product Page: http://www.ftdichip.com/FT-X.htm
Document Feedback: Send Feedback

Version 1.0   Initial Datasheet Created   09/02/12

Version 1.1   Corrected IC part number to FT200XD
                   and added a photo of the wire ended cable   12/06/12