

# Future Technology Devices International Ltd

## Datasheet

### UMFT200XD Breakout Modules



*UMFT200XD is a USB to I<sup>2</sup>C breakout module*

## 1 Introduction

The UMFT200XD breakout module utilizes FTDI's FT200XD IC to convert USB to an I<sup>2</sup>C.

### 1.1 Features

The UMFT200XD is a breakout board that converts USB2.0 Full-Speed to I<sup>2</sup>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<sup>2</sup>C interface operates at +3.3V voltage levels, however all I/Os are 5V tolerant.

### 1.2 Ordering Information

Module	Interface	Features
UMFT200XD-01	I <sup>2</sup> C	USB to I <sup>2</sup> C with four control bus lines, 3.3V power out limited to 50mA and 5V with as safety fuse. I <sup>2</sup> C signals available via 8 pin female connector.
UMFT200XD-NC	I <sup>2</sup> C	USB to I <sup>2</sup> C with four control bus lines, 3.3V power out limited to 50mA and 5V with as safety fuse. I <sup>2</sup> C signals available via 8 pads on the PCB
UMFT200XD-WE	I <sup>2</sup> C	USB to I <sup>2</sup> C with four control bus lines, 3.3V power out limited to 50mA and 5V with as safety fuse. I <sup>2</sup> C signals available via 8, 6" flying leads connected to the PCB pads.

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## 2 Driver Support

<b>Royalty-Free DRIVERS for:</b>	<b>VIRTUAL COM PORT (VCP)</b>	<b>Royalty-Free D2XX Direct Drivers (USB Drivers + DLL S/W Interface):</b>
<ul style="list-style-type: none"><li>• Windows 10 32, 64-bit</li><li>• Windows 8 / 8.1 32, 64-bit</li><li>• Windows 7 32,64-bit</li><li>• Windows Vista and Vista 64-bit</li><li>• Windows XP and XP 64-bit</li><li>• Windows XP Embedded</li><li>• Server XP / 2003 /2008 / 2016</li><li>• Windows CE 4.2-5.2, 6.0/7.0, 2013</li><li>• Mac OS-X</li><li>• Linux 3.2 and greater</li><li>• Android</li></ul>		<ul style="list-style-type: none"><li>• Windows 10 32, 64-bit</li><li>• Windows 8 / 8.1 32, 64-bit</li><li>• Windows 7 32,64-bit</li><li>• Windows Vista and Vista 64-bit</li><li>• Windows XP and XP 64-bit</li><li>• Windows XP Embedded</li><li>• Server XP / 2003 /2008 / 2016</li><li>• Windows CE 4.2-5.2, 6.0/7.0, 2013</li><li>• Mac OS-X</li><li>• Linux 3.2 and greater</li><li>• Android</li></ul>

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

## **Table of Contents**

<b>1</b>	<b>Introduction .....</b>	<b>12</b>
1.1	Features.....	12
1.2	Ordering Information.....	12
<b>2</b>	<b>Driver Support .....</b>	<b>13</b>
<b>3</b>	<b>UMFT200XD Signals and Configurations.....</b>	<b>15</b>
3.1	UMFT200XD CN1 Signal Descriptions .....	15
3.2	UMFT200XD CN2 Signal Descriptions .....	15
3.3	CBUS Signal Options .....	16
3.4	Configuring the MTP ROM .....	17
<b>4</b>	<b>Module Dimensions .....</b>	<b>18</b>
<b>5</b>	<b>Module Wire Connections .....</b>	<b>19</b>
5.1	UMFT200XD-WE Wire Connections.....	19
5.2	UMFT200XD-WE .....	19
<b>6</b>	<b>Module Circuit Schematic .....</b>	<b>20</b>
6.1	UMFT200XD Schematic .....	20
<b>7</b>	<b>Environmental Compliances .....</b>	<b>21</b>
<b>8</b>	<b>Internal MTP ROM Configuration .....</b>	<b>22</b>
<b>9</b>	<b>Contact Information.....</b>	<b>23</b>
	<b>Appendix A - References .....</b>	<b>24</b>
	Document References .....	24
	Acronyms and Abbreviations .....	24
	<b>Appendix B - List of Figures and Tables .....</b>	<b>25</b>
	List of Figures .....	25
	List of Tables .....	25
	<b>Appendix C - Revision History .....</b>	<b>26</b>

### 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	<u>SCL</u>	Input	I <sup>2</sup> C 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	<u>SDA</u>	I/O	I <sup>2</sup> C 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<sup>2</sup>C 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.*
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, <a href="#">AN232R-01</a> , available from <a href="#">FTDI website (www.ftdichip.com)</a> 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.

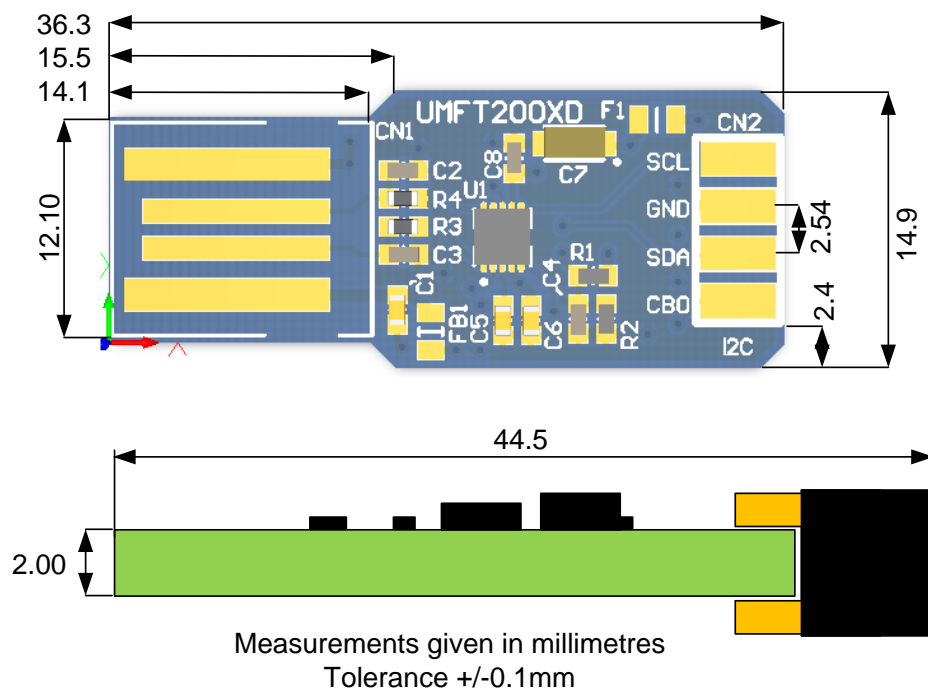
### 3.4 Configuring the MTP ROM

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.

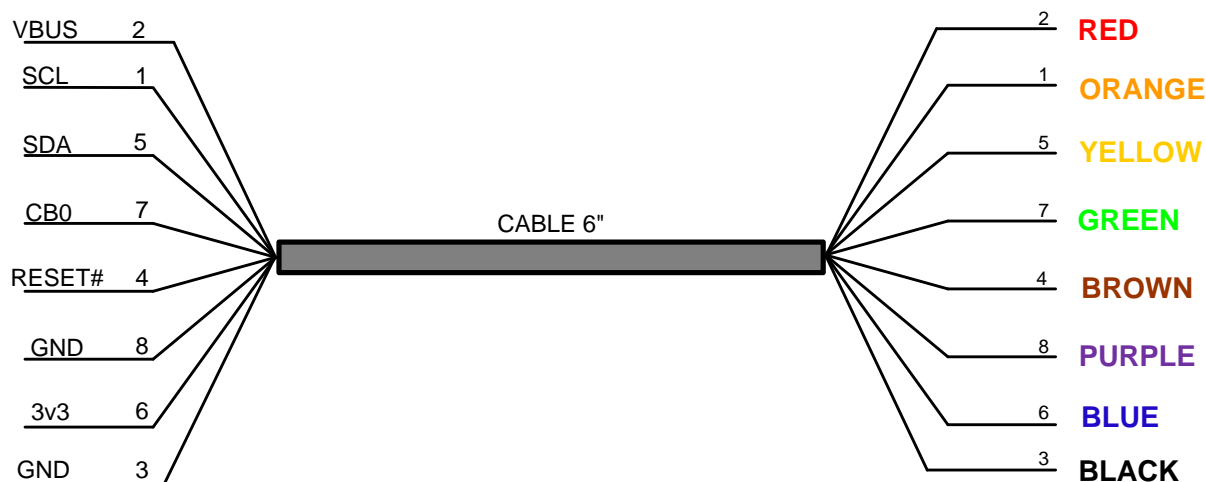
## 4 Module Dimensions



**Figure 4.1 UMFT200XD-01 Module Dimensions**

## 5 Module Wire Connections

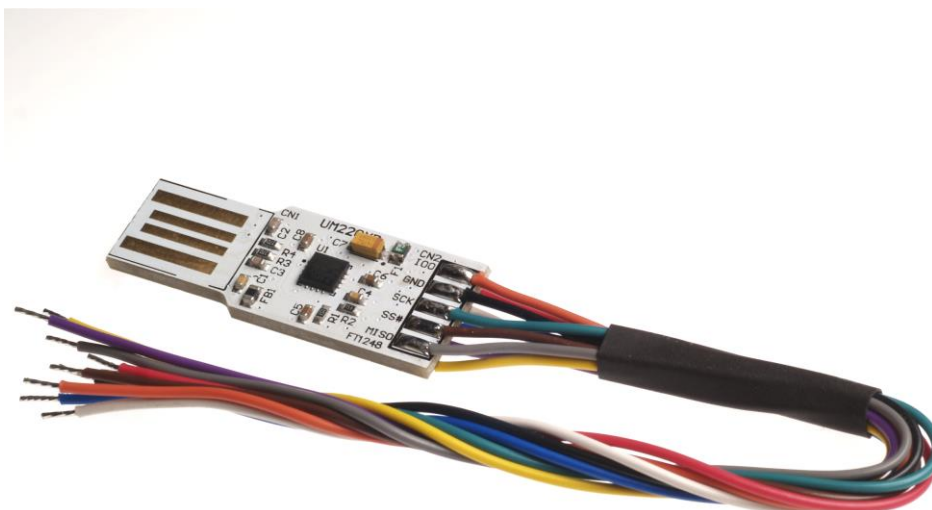
### 5.1 UMFT200XD-WE Wire Connections



**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

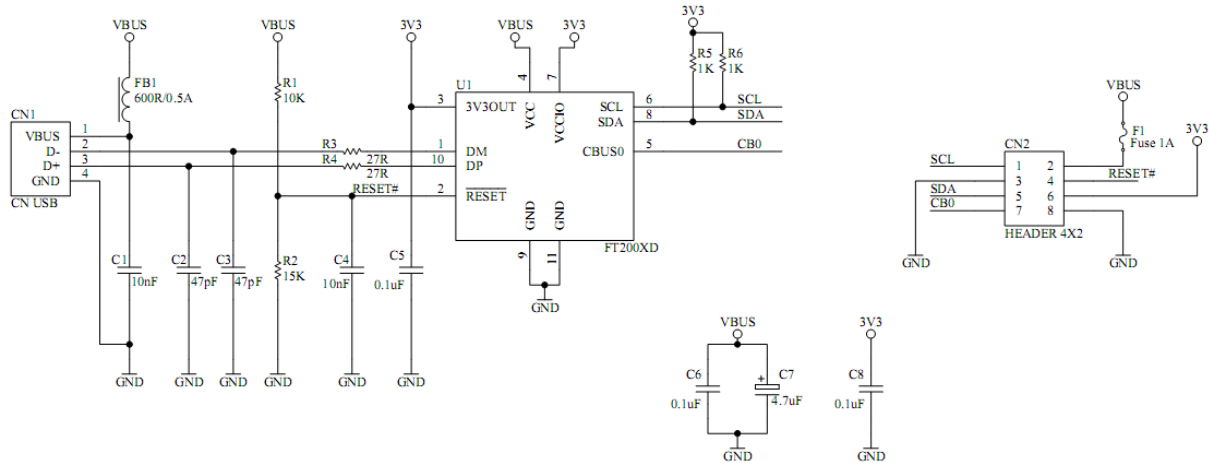


**Figure 5.2 UMFT200XD-WE Image**



## 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 ID (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](http://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](mailto:support1@ftdichip.com) (support1@ftdichip.com) for this service.

## 9 Contact Information

### Head Office – Glasgow, UK

Future Technology Devices International Limited  
Unit 1, 2 Seaward Place, Centurion Business Park  
Glasgow G41 1HH  
United Kingdom  
Tel: +44 (0) 141 429 2777  
Fax: +44 (0) 141 429 2758

E-mail (Sales) [sales1@ftdichip.com](mailto:sales1@ftdichip.com)  
E-mail (Support) [support1@ftdichip.com](mailto:support1@ftdichip.com)  
E-mail (General Enquiries) [admin1@ftdichip.com](mailto:admin1@ftdichip.com)

### Branch Office – Tigard, Oregon, USA

Future Technology Devices International Limited  
(USA)  
7130 SW Fir Loop  
Tigard, OR 97223-8160  
USA  
Tel: +1 (503) 547 0988  
Fax: +1 (503) 547 0987

E-Mail (Sales) [us.sales@ftdichip.com](mailto:us.sales@ftdichip.com)  
E-Mail (Support) [us.support@ftdichip.com](mailto:us.support@ftdichip.com)  
E-Mail (General Enquiries) [us.admin@ftdichip.com](mailto:us.admin@ftdichip.com)

### Branch Office – Taipei, Taiwan

Future Technology Devices International Limited  
(Taiwan)  
2F, No. 516, Sec. 1, NeiHu Road  
Taipei 114  
Taiwan, R.O.C.  
Tel: +886 (0) 2 8797 1330  
Fax: +886 (0) 2 8751 9737

E-mail (Sales) [tw.sales1@ftdichip.com](mailto:tw.sales1@ftdichip.com)  
E-mail (Support) [tw.support1@ftdichip.com](mailto:tw.support1@ftdichip.com)  
E-mail (General Enquiries) [tw.admin1@ftdichip.com](mailto:tw.admin1@ftdichip.com)

### Branch Office – Shanghai, China

Future Technology Devices International Limited  
(China)  
Room 1103, No. 666 West Huaihai Road,  
Shanghai, 200052  
China  
Tel: +86 21 62351596  
Fax: +86 21 62351595

E-mail (Sales) [cn.sales@ftdichip.com](mailto:cn.sales@ftdichip.com)  
E-mail (Support) [cn.support@ftdichip.com](mailto:cn.support@ftdichip.com)  
E-mail (General Enquiries) [cn.admin@ftdichip.com](mailto:cn.admin@ftdichip.com)

### Web Site

<http://ftdichip.com>

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## Appendix A - References

### Document References

[AN232R-01](#)

[FT\\_PROG User Guide](#)

### Acronyms and Abbreviations

Terms	Description
DLL	Dynamic Link Library
BCD	Battery Charger Detection
EEPROM	Electrically Erasable Programmable Read Only Memory
I2C	Inter-Integrated Circuit
LDO	Low Drop Out Regulator
PCB	Printed Circuit Board
TTL	Transistor-Transistor Logic
USB	Universal Serial Bus
UART	Universal Asynchronous Receiver/Transmitter
VCP	Virtual COM Port

## **Appendix B - List of Figures and Tables**

### **List of Figures**

Figure 4.1 UMFT200XD-01 Module Dimensions .....	18
Figure 5.1 UMFT200XD-WE Wire Connections (numbers refer to pad numbers on the PCB) .....	19
Figure 5.2 UMFT200XD-WE Image .....	19
Figure 6.1 UMFT200XD Circuit Schematic .....	20

### **List of Tables**

Table 3.1 USB Connector Pin Out Description .....	15
Table 3.2 I <sup>2</sup> C Module Pin Out Description .....	15
Table 3.3 CBUS Configuration Control .....	16
Table 8.1 Default Internal MTP ROM Configuration .....	22

## Appendix C - Revision History

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Revision	Changes	Date
Version 1.0	Initial Datasheet Created	2012-02-09
Version 1.1	Corrected IC part number to FT200XD and added a photo of the wire ended cable	2012-06-12
Version 1.2	Corrected -01 variant part number	2015-07-03
Version 1.3	Removed TXLED/RXLED/TX&RXLED CBUS functionality. Document template changes made.	2019-02-22

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