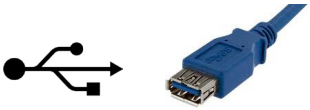
USB solutions from FTDI



FTDI is a pioneer company in USB solutions. Its products are setting standards in USB and USB/serial communication.

USB Made Easy

Whether your design needs silicon chips, cables, or modules, check out FTDI Chip's large portfolio of USB and system level products.

Peripheral Or Host

USB connectivity designs are constructed from two distinct functional capabilities: a host and a device/peripheral type. As part of the total solution, FTDI Chip is able to offer both types of capabilities. With over 30 USB peripheral chips offered in 5 product families, designers can choose the device which best matches their system need. On the USB host side, the FT311 targets the Android ecosystem and joins the Vinculum family which provides system level capabilities with its micro-controller capability, USB host, and USB peripheral support.

Speed

FTDI Chip devices are aimed at full speed and high speed solutions. While the high speed designs offer greater data throughput, full speed devices continue to be a robust, growing market where matching system needs with device features can provide the optimum USB implementation.

Advanced Features

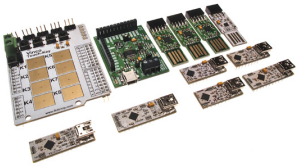
To conserve PCB area and offer additional system value, FTDI Chip adds unique features to enhance USB functionality, like battery charging detection which enables faster charging. FTDI Chip also offers devices linking one USB port to 1, 2, or 4 application interfaces without requiring a USB hub. Save space, power, and system cost when EEPROM (MTP) memory, or unique clocking features are utilized in your system design (see chart on pages 4-5).

Software

Drivers for most major operating systems such as Windows, MAC OS, Android and Linux are available for free download thus allowing for easy integration with minimum development effort.

The Vinculum family of host controllers is also supported with free, precompiled firmware as well as a free toolchain for designers wishing to tailor the firmware to their specific requirements.

Modules



Development modules are available to enable rapid design development. The modules are available in a variety of mechanical formats to allow easy bread-boarding or immediate access to the bridge interfaces. Additionally application modules are available which provide specific system functionality (see pages 9, 10 and 11).

Cables

Similar to the module solutions are a range of cables offering TTL, RS232, RS422 or RS485 level interfaces. These cables can be used for development purposes or as accessories for accessing existing products over USB (see pages 12 and 13)

So when it comes to adding USB into your system design, let FTDI Chip make it easy ...

USB AS EASY AS 123

USB DEVICE (PERIPHERAL) SOLUTIONS

FTDI offers a comprehensive range of ICs for USB peripherals, including bridge chips and devices targeted at standard class driver support.

Order. No.:	120555	120558	120559	120560	120854	130204	150655	120563
Device	FT200XD	FT201X	FT220X	FT221X	FT230X	FT231X	FT234XD	FT240X
External interfaces	I²C slave	I²C slave	SPI/FT1248 (4-bits)	SPI/FT1248 (8-bits)	Basic handshake UART	Full handshake UART	Basic handshake UART	8 bit FIFO
USB Speed	Full Speed (12Mbps)	Full Speed (12Mbps)	Full Speed (12Mbps)	Full Speed (12Mbps)	Full Speed (12Mbps)	Full Speed (12Mbps)	Full Speed (12Mbps)	Full Speed (12Mbps)
USB Transfer Type	Bulk	Bulk	Bulk	Bulk	Bulk	Bulk	Bulk	Bulk
No. External Channels	1	1	1	1	1	1	1	1
Internal memory	512B – RX 512B – TX	512B – RX 512B – TX	512B – RX 512B – TX	512B – RX 512B – TX	512B – RX 512B – TX	512B – RX 512B – TX	512B – RX 512B – TX	512B – RX 512B – TX
Port Speed	Up to 3.4Mbit/s	Up to 3.4Mbit/s	Up to 500kB/s	Up to 1MB/s	Up to 3MBaud	Up to 3MBaud	Up to 3MBaud	Up to 1MB/s
Clock Oscillator	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal
Data configuration memory	Internal MTP	Internal MTP	Internal MTP	Internal MTP	Internal MTP	Internal MTP	Internal MTP	Internal MTP
Operating Temp.	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Core supply	3.3V to 5V	3.3V to 5V	3.3V to 5V	3.3V to 5V	3.3V to 5V	3.3V to 5V	3.3V to 5V	3.3V to 5V
IO supply	1.8V to 3.3V	1.8V to 3.3V	1.8V to 3.3V	1.8V to 3.3V	1.8V to 3.3V	1.8V to 3.3V	1.8V to 3.3V	1.8V to 3.3V
Battery Charger Detection	YES	YES	YES	YES	YES	YES	YES	YES
Internal DMA	NO	NO	NO	NO	NO	NO	NO	NO
Packages	10 DFN	16 SSOP/ 16 QFN	16 SSOP/ 16 QFN	20 SSOP/ 20 QFN	16 SSOP/ 16 QFN	20 SSOP/ 20 QFN	12 DFN	24 SSOP/ 24 QFN

Order. No.: 131269	131413	131414	103998	72508	72510	69375	70931
FT120	FT121	FT122	FT232H	FT2232H	FT4232H	FT2232D	FT232R FT245R
8/16 bit, Multiplexed	SPI slave	8/16 bit, Multiplexed	UART, FIFO, FT1248, 1 x MPSSE* Controllers	UART, FIFO, 2 x MPSSE*, Fast serial, 8051 interface	UART 2 x MPSSE*	UART, FIFO, MPSSE*, Fast serial, 8051 interface	FT232 – UART FT245 – FIFO
Full Speed (12Mbps)	Full Speed (12Mbps)	Full Speed (12Mbps)	High (480Mbps)	High (480Mbps)	High (480Mbps)	Full Speed (12Mbps)	Full Speed (12Mbps)
Bulk Isochronous Interrupt	Bulk Isochronous Interrupt	Bulk Isochronous Interrupt	Bulk	Bulk	Bulk	Bulk	Bulk
1	1	1	1	2	4	2	1
320B/ configured by application	2kB/ configured by application	2kB/ configured by application	4kB RX/TX buffer per channel	4kB RX/TX buffer per channel	2kB RX/TX buffer per channel	384B – RX 128B – TX per channel	256B – RX 128B – TX
Up to 1MB/s	Up to 1MB/s	Up to 1MB/s	Up to 12Mbaud	Up to 12Mbaud	Up to 12Mbaud	Up to 3Mbaud	Up to 3Mbaud
6MHz crystal	Internal	Internal	12MHz crystal	12MHz crystal	12MHz crystal	6MHz crystal	Internal
Internal registers	Internal registers	Internal registers	External EEPROM	External EEPROM	External EEPROM	External EEPROM	Internal EEPROM
-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
3.3V to 5V	3.3V to 5V	3.3V to 5V	1.8V	1.8V	1.8V	5V	4V to 5V
3.3V	1.8V to 3.3V	1.8V to 3.3V	3.3V	3.3V	3.3V	3.3V to 5V	1.8V to 5V
NO	YES	YES	NO	NO	NO	NO	NO
YES	YES	YES	NO	NO	NO	NO	NO
28 TSSOP/ 28 QFN	16 TSSOP/ 16 QFN	28 TSSOP/ 28 QFN	48 LQFP/ 48 QFN	64 LQFP/ 64 QFN	64 LQFP/ 64 QFN	48 LQFP	32 QFN/ 28 SSOP

USB HOST SOLUTIONS

As mobility accelerates, the need for host support in tablets, handsets, and consumer equipment becomes critical to enable USB connections. FTDI Chip is expanding its USB host solutions with a focus on: Android Open Accessories Initiative, add-on USB host capability for USB2.0 Hi-Speed, and continued support for system level solutions that include USB technology (16 bit micro-controller, USB host, and USB device capabilities).

Integrated circuits that provide USB host ports in a system solution are provided in the Vinculum family of devices. The Vinculum II (VNC2) provides ample hardware support including 16 bit microcontroller, USB host and device capabilities, embedded flash memory, and extensive interface options. In addition, the VNC2 has an extensive suite of application ROM design files, and a toolchain for developing application specific designs.

Order. No.:	86481 **VNC2**	131296 **FT311D**	143002 **FT313H**
Description	Programmable USB 2.0 Host/ Device Controller	ANDROID USB Host	Programmable USB 2.0 Host
USB Speed	Full (12Mbps) / Low speed (1.5Mbps)	Full-Speed (12Mbps)	Hi-Speed (480Mbps)
USB Transfer Types	Bulk, Interrupt, Isochronous	Bulk	Bulk, Interrupt, Isochronous
No. of USB ports	2	1	1
No. of external channels	Flexible	1	1
Supported External Interfaces	ASYNC FIFO, SYNC FIFO, UART, 2 x SPI SLAVE, 1 x SPI MASTER, GPIO, PWM, DEBUG PORT	GPIO, PWM, UART, I²C Master, SPI Master, SPI Slave	8/16 bit multiplexed bus, SRAM, NOR
Core	16/32-bit Harvard MCU Core	-	-
Internal Memory	16kB RAM 256kB FLASH	-	320 B
Data rates	Up to 6MBaud	Up to 6MBaud	2-25 MB/s
Configuration Storage	Internal flash	-	Internal Registers
Clocking	12MHz Crystal	12MHz Crystal	6MHz Crustal
Operating temp.	-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
Core supply	1.8V	1.8V	3.3V
IO Supply	3.3V	3.3V	1.8V to 3.3V
Packages	32/48/64 LQFP and QFN	32 LQFP and QFN	64 QFN/LQFP/TQFP

DEVELOPMENT MODULES

USB HOST SUPPORT

UMFT311EV

Description: FT311 host development module connects to an Android USB device port. This development system enables the bridge from SPI master, SPI slave, I²C, UART, GPIO, and PWM to a USB host port.

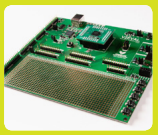
USB connector: 1 x Type-A

UMFT313EV

Description: FT313 Hi-Speed USB host development module

USB connector: 1 x Type-A

V2EVAL



Description: Motherboard for VNC2 daughter cards. Includes connectors for all IO and USB plus a prototyping area

USB connector: Type-B for debug port. 2 x Type-A

Notes: Supports 3 VNC2 package sizes

EXT32
(32 pin daughter card)

EXT48
(48 pin daughter card)

EXT64
(64 pin daughter card)

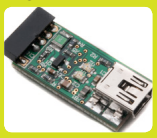
VINCO

Description: Arduino inspired form factor for VNC2 development. Based on VNC2-64L and includes additional 10-bit ADC

USB connector: Type A and mini-B

Notes: May be used with Arduino or VNC2 shields

VNC2 Debugger / Programmer



Description: VNC2 Programmer/debugger module for use with the IDE development tools

USB connector: Mini-B

Notes: Used to load and debug firmware in VNC2 devices, via the debug pin

H-CHIP SERIES SUPPORT

USB2.0 Hi-Speed support with multi-channel capabilities

UM232HB

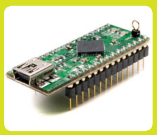
Chip: FT232HL

USB connector: PCB tracks only

Form Factor: Breakout module

Application: USB to UART, ASYNC FIFO, SYNC FIFO, or MPSSE

UM232H



Chip: FT232HL

USB connector: Mini-B

Form Factor: 28 pin 0.6" wide DIP

Application: USB to UART, ASYNC FIFO, SYNC FIFO, or MPSSE

FT2232H Mini Module

Chip: FT2232HL

USB connector: Mini-B

Form Factor: Two 26 pin double row headers

Application: USB to UART, ASYNC FIFO, SYNC FIFO, or MPSSE x 2

FT4232H Mini Module

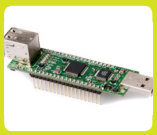
Chip: FT4232HL

USB connector: Mini-B

Form Factor: Two 26 pin double row headers

Application: USB to UART or MPSSE x 2

FT4232H Hi-Speed Serial/Hub



Chip: FT4232HL

USB connector: Type A

Form Factor: 36 pin 0.6" wide DIP with one USB upstream connector and two downstream connectors.

Application: USB to UART, MPSSE or a USB hub. May act as an expansion device to VNC2 USB host.

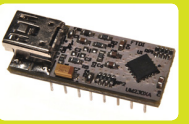
X-CHIP SERIES SUPPORT

An advanced USB2.0 Full Speed Family with optimized power, footprint and feature set

UMFTxxxXB*

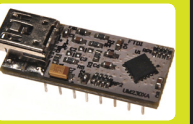
Description:
Breakout Module
Supported IC's:
FT200XD, FT201XQ, FT220XQ, FT230XQ
USB connector: PCB tracks only

UMFTxxxXA*



Description:
0.3" wide development
Supported IC's:
FT201XS, FT220XS, FT221XS, FT230XS, FT231XS, FT240XS
USB connector: Mini-B

UMFTxxxXE*



Description:
0.6" wide development
Supported IC's:
FT201XS, FT221XS, FT231XS, FT240XS
USB connector: Mini-B

UMFT231XC

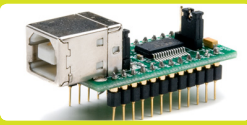
Description:
Battery Charger Detection Module
Supported IC's:
FT231XS
USB connector: Micro-B

* 'xxx' correlates to the numbers of the supported part types

R-CHIP SERIES SUPPORT

FTDI Chip's popular USB2.0 Full Speed Family

UM232R

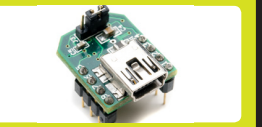


Chip: FT232RL
USB connector: Type B
Form Factor: 24 pin, 0.6" wide DIP
Application: USB to UART

MM232R

Chip: FT232RQ
USB connector: Type B
Form Factor: 16 pin 0.1" pitch
Application: USB to UART

UB232R



Chip: FT232RQ
USB connector: Type B
Form Factor: 8 contacts, 0.1" pitch
Application: USB to UART

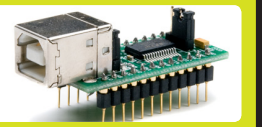
EVAL232R

Chip: FT232RL
USB connector: Type B
Form Factor: USB to DB9 converter
Application: USB to RS232

USB-Key

Chip: FT232RL
USB connector: Type A
Form Factor: Dongle
Application: ChipID

UM245R

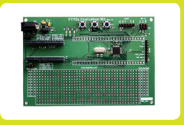


Chip: FT245RL
USB connector: Type B
Form Factor: 24 pin 0.6" wide DIP
Application: USB to FIFO

FT12 SERIES SUPPORT

Inspired by the D12, industry standard, with value-added features and footprints

UMFT12XEV



Description: Development system with LPC1114 micro-controller for use with daughter-cards for system development

UMFT120DC

Chip: FT120T
USB Connector: Micro-B
Footprint: 28 pin 0.8" wide DIP

UMFT121DC

Chip: FT121T
USB Connector: Micro-B
Footprint: 14 pin 0.8" wide DIP

UMFT122DC

Chip: FT122T
USB Connector: Micro-B
Footprint: 28 pin 0.8" wide DIP

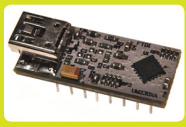
X-CHIP SERIES SUPPORT

An advanced USB2.0 Full Speed Family with optimized power, footprint and feature set

UMFTxxxXB*

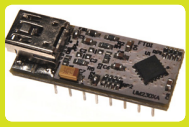
Description:
Breakout Module
Supported IC's:
FT200XD, FT201XQ, FT220XQ, FT230XQ
USB connector: PCB tracks only

UMFTxxxXA*



Description:
0.3" wide development
Supported IC's:
FT201XS, FT220XS, FT221XS, FT230XS, FT231XS, FT240XS
USB connector: Mini-B

UMFTxxxXE*



Description:
0.6" wide development
Supported IC's:
FT201XS, FT221XS, FT231XS, FT240XS
USB connector: Mini-B

UMFT231XC

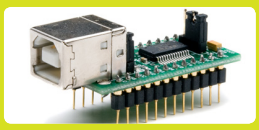
Description:
Battery Charger Detection Module
Supported IC's:
FT231XS
USB connector: Micro-B

* 'xxx' correlates to the numbers of the supported part types

R-CHIP SERIES SUPPORT

FTDI Chip's popular USB2.0 Full Speed Family

UM232R

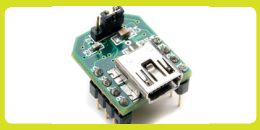


Chip: FT232RL
USB connector: Type B
Form Factor: 24 pin, 0.6" wide DIP
Application: USB to UART

MM232R

Chip: FT232RQ
USB connector: Type B
Form Factor: 16 pin 0.1" pitch
Application: USB to UART

UB232R



Chip: FT232RQ
USB connector: Type B
Form Factor: 8 contacts, 0.1" pitch
Application: USB to UART

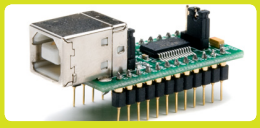
EVAL232R

Chip: FT232RL
USB connector: Type B
Form Factor: USB to DB9 converter
Application: USB to RS232

USB-Key

Chip: FT232RL
USB connector: Type A
Form Factor: Dongle
Application: ChipID

UM245R



Chip: FT245RL
USB connector: Type B
Form Factor: 24 pin 0.6" wide DIP
Application: USB to FIFO

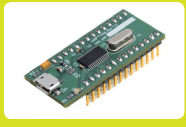
FT12 SERIES SUPPORT

Inspired by the D12, industry standard, with value-added features and footprints

UMFT12XEV

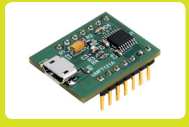
Description: Development system with LPC1114 micro-controller for use with daughter-cards for system development

UMFT120DC



Chip: FT120T
USB Connector: Micro-B
Footprint: 28 pin 0.8" wide DIP

UMFT121DC



Chip: FT121T
USB Connector: Micro-B
Footprint: 14 pin 0.8" wide DIP

UMFT122DC

Chip: FT122T
USB Connector: Micro-B
Footprint: 28 pin 0.8" wide DIP

CABLE SOLUTIONS

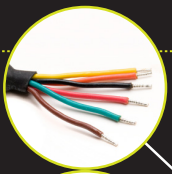
USB TO LEGACY RS232 CONVERTER CABLES

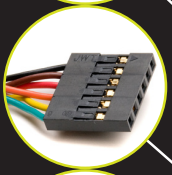
	PART NUMBER	IO LEVELS
Premium USB to Legacy RS232 Converter	US232R-10	RS232
	US232R-100	
	US232R-500	
USB-Serial Converter	UT232R-200	RS232
	UT232R-500	
Chipi-x	CHIPI-X10	RS232

USB TO LEGACY RS232 OR RS422 OR RS485 CONVERTER CABLES

	PART NUMBER	IO LEVELS
RS232 Converter	USB-RS232-WE-1800-BT_0.0	RS232
	USB-RS232-WE-1800-BT_3.3	
	USB-RS232-WE-1800-BT_5.0	
	USB-RS232-WE-5000-BT_0.0	
	USB-RS232-WE-5000-BT_3.3	
	USB-RS232-WE-5000-BT_5.0	
RS422 Converter	USB-RS422-WE-1800-BT	RS422
	USB-RS422-WE-5000-BT	
RS485 Converter	USB-RS485-WE-1800-BT	RS485
	USB-RS485-WE-5000-BT	

USB TO TTL SERIAL CABLES





	PART NUMBER	IO LEVELS
Type A USB to wire end TTL Serial	TTL-232RG-VREG1V8-WE	1.8V
	TTL-232RG-VREG3V3-WE	3.3V
	TTL-232RG-VSW3V3-WE	3.3V
	TTL-232RG-VSW5V-WE	5V
	TTL-232RG-VIP-WE	1.8V to 5.25V[1]
	TTL-232R-3V3-WE	3.3V
	TTL-232R-5V-WE	5V
Type A USB to SIP Connector	TTL-232R-5V	5V
	TTL-232R-3V3	3.3V
	TTL-232R-3V3-2MM	3.3V
Type A USB to 3.5mm Audio Jack	TTL-232R-5V-AJ	5V
	TTL-232R-3V3-AJ	3.3V