

## **Application Note**

## AN\_242

## FTDI\_UART\_Terminal\_User\_Manual

Version 1.0

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This utility is for use with FTDI USB to UART devices. The utility provides a terminal emulation function for use on Android devices. The Android system must use Android OS version 3.2 or later and provide a USB host port.

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Use of FTDI devices in life support and/or safety applications is entirely at the user's risk, and the user agrees to defend, indemnify and hold FTDI harmless from any and all damages, claims, suits or expense resulting from such use.



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## **1** Introduction

This utility is for use with FTDI USB to UART devices. The utility provides a terminal emulation function for use on Android devices. The Android system must use Android OS version 3.2 or later and provide a USB host port.

## 1.1 Features

- The application will open automatically when you plug in supported FTDI devices.
- It supports FTDI USB TTL Serial, USB RS232, RS422, RS485 and USB Hi-Speed cables.
- Suitable for use on any Android platform with a USB host port running Android v3.2 or later versions.
- Provide general terminal UART utility.
- Support CTS/RTS, DTR/DSR and XOFF/XON Flow controls.
- Support Baud from 300 to 921600.
- Save file and Send file functions support XModem, YModem and ZModem file transfer protocols.
- USB Plug and Play.
- USB 2.0 Full Speed compatible.



### **1.2 Install Application**

Find this application in the "Play Store" by searching "ftdi uart" and then install it, by clicking on the icon.



Figure 1 The Application in Play Store

### **1.3 Launching and Exiting the Application**

When the Android device is attached to the FTDI device over the USB port, the Android device will prompt the user to execute this application.



Figure 2 Launch Application

To exit this application, tap the back button and it will show a notification message. Tap the back button again to exit before the notification message disappears.





## 2 Functions

This section describes how to use this utility.

		😴 🛪 🛢 3:04					
( FTDI UART Terminal		ŧ					
Key Code	Save to File	Send File					
Status Bar							
	Data Area						
CHAR	Input Area	Write					
Data Format Button							

Figure 3 Main Screen

## 2.1 Serial Settings

The application automatically configures the serial port of the FTDI USB to UART device with default settings: 9600 baud, 1 stop bit, 8 data bit, no parity, CTS/RTS flow control for port 0 when the FTDI device is connected. Please refer to **2.4.1 Setting** for the details of manually configuring the port.





### 2.2 Send Data

The sent data is shown in the data area when the content format is character format, otherwise it will show a warning message three times when the "Write" button is tapped. Tapping the data format button toggles CHAR or HEX format for sending data.

#### 2.2.1 Send Plain Text Data

Input data in the input area and tap the "Write" button to send data when the data format button shows "CHAR".

ă,		▼ ★ ■ 3:06
FTDI UART Terminal		:
Key Code	Save to File	Send File
Format - Character Port 0; UART Setting - Baudrate:9600 StopBit:1 DataBit:	8 Parity:None FlowControl:CTS/RTS	
this is test		
CHAR content		Write
~		

Figure 4 Send Plain Text Data

#### 2.2.2 Send Hexadecimal Format Data

Input data in the input area and tap the "Write" button to send data when the data format button shows "HEX".



Figure 5 Send Hexadecimal Format Data





Note the need to input 2 characters for hexadecimal data and both character should be from '0' to '9' or from 'a' to 'f', otherwise the application will show a warning message when the "Write" button is tapped.

#### 2.2.3 Send Special Key Code Data

Tap the "Key Code" button and it will show a row with two buttons: Ctrl-C and ESC.

Tap "Ctrl-C" or "ESC" button to send its corresponding key code data.



Figure 6 Send Special Key Code Data



### 2.3 File Transfer

File transfer functions are allowed after the UART is configured and when the content format is character format, otherwise it will show a warning message when the "Save to File" button or "Send File" button is tapped.

#### 2.3.1 Receive File

Step 1: Tap the "Save to File" button to prepare receiving file.

Step 2: Select protocol.

×.							🛪 💼 3:05
FTDI UART Termina							÷
Key Code		S	Save to File			Send File	
Format - Character Port 0; UART Setting - Baudrate:960	Protocol						
	ASCII						
	XModem-Chec	kSum					
	XModem-CRC						
	XModem-1KCF	C					
	YModem						
	ZModem						
CHAR							Write
	÷.			6	<u>ה</u>		

Figure 7 Select Protocol

- Step 3: Select file destination.
  - I. For "ASCII", "XModem-CheckSum", "XModem-CRC" and "XModem-1KCRC" protocol, there is the option to create a new file or select an exist file for saving.

					-	🛪 💼 3:07
FTDI UART Termina						ŧ
Key Code		5	Save to File		Send File	
Format - Character Port 0; UART Setting - Baudrate:960						
	File Dest	ination				
	Create New F	ile				
	Save to File					
HEX						Write
	÷	$\supset$		c		

Figure 8 Select File Destination





### (1) Create New File

Tap "Select Directory" to select a directory for the new file to be stored in.

FTDI UART Termina	/storage/sdcard0		
Key Code		Send File	
Format - Character Port 0: LIART Setting - Baudrate:960			
Forto, OANT Setting - Daddrate. 500	Music		
	Podcasts		
	Ringtones		
	Alarms		
	Notifications		
	Pictures		
	Movies		
HEX	Select Directory		Write

**Figure 9 Select Directory** 

<u>لا</u>					🛪 🔳 3:08
👘 FTDI UART Termin					
Key Code		Save t	to File	Send File	
Format - Character Port 0; UART Setting - Baudrate:96					
	Create Ne	wFile			
	File Name :				
		Cancel	0		
HEX					Write
	<del>(</del>				

Input the file name and tap "OK" to create a new file.

Figure 10 Create New File



#### (2) Save to File Select an exist file.

×.		<del>,</del>	イ 💼 3:08
( FTDI UART Termina	/storage/sdcard0		
Key Code Format - Character	DCIM	Send File	
Port 0; UART Setting - Baudrate:960	Android		
	catlog		
	j2xx		
	ft311		
	0_KB_10.txt		
	ibuka		
	0_KB_200. txt		
HEX	0_MB_1.txt		Write

Figure 11 Select a File

II. For "YModem" and "ZModem" protocol, select a directory for file saving. The file name will be created automatically depending on the content information.

<u>نان کار اور اور اور اور اور اور اور اور اور ا</u>			
FTDI UART Termina	/storage/sdcard0		
Key Code		Send File	
Format - Character			
Forto, OAH Octung Dadurate. 500	Music		
	Podcasts		
	Ringtones		
	Alarms		
	Notifications		
	Pictures		
	Movies		
HEX	Select Directory		Write

Figure 12 Select Directory

The status bar will show the name of the file being saved and the saving progress.





### 2.3.2 Send File

Step 1: Tap the "Send File" button to send a file.

Step 2: Select protocol.

						<b>1</b>	🖌 📋 3:05
FTDI UART Termina							
Key Code			Save to File			Send File	
Format - Character Port 0; UART Setting - Baudrate:960	Protocol						
	ASCII						
	XModem-Chec	kSum					
	XModem-CRC						
	XModem-1KCR	C					
	YModem						
	ZModem						
CHAR							Write
	÷	$\supset$		Ē	בי		

Figure 13 Select Protocol

Step 3: Select a file.

i i		-	🛪 💼 3:08
FTDI UART Termina	/storage/sdcard0		:
Key Code Format - Character	DCIM	Send File	
Port 0; UART Setting - Baudrate:960	Android		
	catlog		
	j2xx		
	ft311		
	0_KB_10.txt		
	ibuka		
	0_KB_200. txt		
HEX	0_MB_1. txt		Write

Figure 14 Select a File

The Status bar will show the name of the file to be sent and the sending progress.





Note:

1. When the file list is not updated, tap ".." to go to its parent folder and enter this folder again, and the file list will be refreshed.

м. э́		×5	😴 🛪 👔 1:38
( FTDI UART Termina	/storage/sdcard0		
Key Code			
Format - Character			
Port 0; UART Setting - Baudrate: 960	Music		
	Podcasts		
	Ringtones		
	Alarms		
	Notifications		
	Pictures		
	Movies		
HEX	Download		Write

Figure 15 Refresh File List

2. ZModem protocol of FTDI UART Terminal is a simple file transfer protocol. It is implemented and verified with Microsoft XP hyper terminal and Moxa PComm terminal.



## 2.4 Menu Functions

For tablet devices, tap the menu icon to launch the menu:

FTDI UART Terminal				:
Key Code	Save to File		Setting	
Format - Character Port 0; UART Setting - Baudrate:9600 StopBit:1 DataBit	8 Parity:None FlowControl:CTS/RTS		Content Format	
			Font Size	
			Save Content Da	ta
			Clean Screen	
			Echo – On	
			Online Help	
HEX				Write
~		Ċ		

#### Figure 16 Menu Icon on Tablet Device

For phone devices, press the menu key to launch the menu.

#### 2.4.1 Setting

The setting menu displays a row with several setting items for serial port configuration.

<u>ن</u>						🔝 🛪 🛢 3:04
FTDI UART	Terminal					8
Ke	ey Code		Save to File		Send Fi	le
Format - Character Port 0; UART Setting - E	3audrate:9600 StopBit:1	DataBit:8 Parity:None Fl	lowControl:CTS/RTS			
CHAR						Write
Baud Rate	Stop(bit)	Data(bit)	Parity	Flow Control	Port	
9600				CTS/RTS		Configure
		$\Leftrightarrow$				

Figure 17 Serial Settings





The configuration settings allow the baud rate to be set at standard values between 300 and 921600 baud with CTS/RTS flow control and the values between 300 and 115200 baud with or without flow control.

Stop bits may be set for 1 or 2.

Data bits may be set for 7 or 8

Parity may be set for None, ODD, EVEN, Mark or Space.

Flow allows for no flow control, RTS/CTS, DTR/DSR and XOFF/XON flow controls. The application will show a warning message when "none" flow control is selected.

Port number items are dependent on the connected cable/device.

After selecting the required setting for each item, tap the "Configure" button to set it and setting information will be shown on the status bar: content format, target port number and UART setting.



Figure 18 Information on Status Bar



#### 2.4.2 Content Format

Select the data format of the content shown in the data area. The default content format is character format.

					( <b>f</b> :	🛪 🛢 3:09
FTDI UART Termina						
Key Code		S	ave to File		Send File	
Format - Character Port 0; UART Setting - Baudrate:960						
	Content F	ormat				
	Character					
	Hexadecimal					
HEX						Write
	÷-			Ē		

Figure 19 Select Content Format

#### I. Character

The data is displayed in character format in Figure 20:



Figure 20 Character Format





#### II. Hexadecimal

🏹 🛑 3:13 FTDI UART Terminal Key Code Save to File Send File rmat - Hexadecimal rt 0; UART Setting -DataBit:8 Parity:None Flo 72 65 3a 20 46 54 44; 20 55 53 42 20 55 41; 61 6c Model: USB UA Terminal 6f 65 65 6d 3a Write  $\rightarrow$  $\bigcirc$ Ū

The data is displayed in hexadecimal format in Figure 21:

#### **Figure 21 Hexadecimal Format**

Note that when content format is hexadecimal format, the new incoming data sent to the Android device is not shown.



### 2.4.3 Font Size

Select the font size of the content shown in the data area. Default font size is 12.

		🛜 🏹 🛢 3:13
FTDI UART Termin	nal	
Key Code	Save to File	Send File
Font Size		
5		
6		
7		
8		
10		
12		
14		
16		
18		
20		
HEX		Write

Figure 22 Select Font Size





#### 2.4.4 Save Content Data

Save the data currently shown in the data area into a new file or an exist file. The process is the same with 2.3.1 Receive File - Step 3: Select file destination - I.

#### 2.4.5 Clean Screen

Clear all content shown in the data area.

#### 2.4.6 Echo

Select the echo function to be on or off. Default echo setting is on.

The data sent by tapping the "Write" button is shown in the data area when the echo function is on.

Xiii					( <b>t</b> .	🛪 💼 3:09
FTDI UART Termin	al					
Key Code		Sa	ave to File		Send File	
Format - Character Port 0; UART Setting - Baudrate:96						
	Echo					
	On					
	Off					
HEX						Write
		_	$\sim$	_		
	<u> </u>	$\supset$				

Figure 23 Select Echo Function

#### 2.4.7 Online Help

Get this user manual from the FTDI website (<u>http://www.ftdichip.com/Support/Documents/AppNotes/AN\_242\_FTDI\_UART\_Terminal\_User\_Man\_ual.pdf</u>).





## Appendix A – References

## **Acronyms and Abbreviations**

Terms	Description
CTS	Clear To Send
DSR	Data Set Ready
DTR	Data Terminal Ready
HEX	Hexadecimal
RTS	Request To Send
TTL	Transistor-Transistor Logic
UART	Universal Asynchronous Receiver Transmitter
USB	Universal Serial Bus



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## **Appendix C- Revision History**

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