



Future Technology Devices International Ltd

Vinculum Firmware Tools User Manual

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Future Technology Devices International Ltd (FTDI)

373 Scotland Street, Glasgow G5 8QB United Kingdom

Tel.: +44 (0) 141 429 2777 Fax: + 44 (0) 141 429 2758

E-Mail (Support): vinculum.support@ftdichip.com Web: <http://www.vinculum.com>

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Signatory	Signature	Date
Managing Director	F. Dart	2007-10-29
Principal Hardware Engineer		
Principal Software Engineer	A. Miller	2007-10-29
Senior Marketing Manager	R. Joshi	2007-10-29
Sales Manager	D. McCaffrey	2007-10-29

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1.0 Preface

The objective of this document is to describe the tools used to modify, customise and program the Vinculum VNC1L firmware.

1.1 Conventions

The following conventions are used in this document:

Convention	Description
Monospaced type	Indicates input or output from the monitor.
Boldface monospaced type	Indicates input supplied by the user.
<i>Italic monospaced type</i>	Indicates binary characters (ASCII values of characters).
Important	Signals that the information supplied is important.
Note	Provides additional information about a topic.
Warning	Indicates potential damage to equipment or loss of data.
:	Is used to show a range. For instance, a range of bits 15:9 is bits 15 to 9 (inclusive) of a binary value.
VNC1L	Indicates information specific to the Vinculum VNC1L device.
↵	carriage return (0x0D).
·	space (0x20).
<i>d</i>	Represents a single decimal character (0 to 9).
<i>x</i>	Represents a single hexadecimal character (0 to 9 and A to F).
<i>c</i>	Represents a binary character (0x00 to 0xFF).

Table 1.1 Document Conventions

1.2 References

This document does not describe the hardware interfaces required to connect a microcontroller to a VNC1L device nor does it provide application notes. The following documents are available from FTDI and other sources for this purpose:

Document Reference	Description
Vinculum Website	The main website for the Vinculum family of USB Host Controllers http://www.vinculum.com/
Vinculum Firmware User Manual	Firmware User Manual for the Vinculum VNC1L device http://www.vinculum.com/
DS_VNC1L-1A	Vinculum Embedded USB Host Controller IC Data Sheet http://www.vinculum.com/
AN232R-01	Bit Bang Modes for the FT232R and FT245R http://www.ftdichip.com/

Table 1.2 Other Documents Available

1.3 Acronyms and Abbreviations

The following terms are used within this document:

Terms	Description
8.3	A filename format consisting of 1 to 8 characters, optionally followed by a period (‘.’) then an optional extension of up to 3 characters. For example, “TEST.TXT”, “ANEWFILE.1” or “AFILE”.
FAT	File Allocation Table. The name for the file system typically used for USB Flash Disks. Variants are FAT12, FAT16 and FAT32, the numbers referring to the number of bits used to specify a cluster on the disk.
Monitor	Command line interface which allows instructions to be given to the VNC1L and responses to be returned.
ROM	Binary file for programming Vinculum Firmware
FTD	Reflasher file for programming Vinculum Firmware

Table 1.3 Acronyms and Abbreviations

2.0 Introduction

Selected settings of the Vinculum VNC1L firmware can be changed to allow more flexibility when deploying the Vinculum in applications. The typical settings which may be changed are the baud rate of the Monitor or the starting command mode. This can be useful to reduce the number of setup commands an application requires to send.

3.0 Vinculum Firmware Customiser

Many default settings of the Vinculum VNC1L firmware may be customised using the Vinculum Firmware Customiser application. The application can be used to read and write either a ROM file or a reflasher FTD file and convert between the two formats.

The Customiser has options for:

- Setting the baud rate and flow control parameters for the Vinculum VNC1L Monitor when configured as a UART interface.
- The initial mode of the firmware Monitor.
- Options for displaying prompts and messages.
- Disabling firmware upgrades or data mode.
- Code page for filename capitalisation.
- A user specified version code to append to the firmware version.

The application is navigated in a linear fashion with “Next” and “Previous” buttons to move between screens. Settings in each screen are remembered by the application to allow corrections to be made. A summary of the settings in the file is shown when it is first opened and the modified settings are shown before it is written to disk.

The version information of the Customiser application can be found either by opening the “About...” box from the System Menu of the application or viewing the properties of the application in Windows Explorer.

Firmware version number V03.55 and upwards are supported by the Vinculum Firmware Customiser. Firmware Customiser Version 1.0 is described in this section.

3.1 Implications for Technical Support

If a customised firmware is found to cause issues in an application, firstly attempt to reproduce the issue using the equivalent unmodified standard firmware distribution from the Vinculum Website **before** contacting Vinculum Support.

The fact that a firmware has been modified must be stated in the initial contact with Vinculum Support and an appropriate summary of changes supplied. The “Copy” function in Section 3.2.2 is suitable for this purpose.

3.2 Running Vinculum Firmware Customiser

The Vinculum Firmware Customiser application is contained in a file called VNCFWMOD.EXE. This is distributed in a ZIP file from the Vinculum Website which is referenced in Table 1.2. When VNCFWMOD.EXE is started it will appear with the dialog box in Figure 3.1.

3.2.1 Opening Firmware Files

To choose a ROM or FTD file to modify click on “Browse...”. FTD or ROM files can be selected using the “File of Type...” drop down box in the standard Windows File Open dialog box displayed.

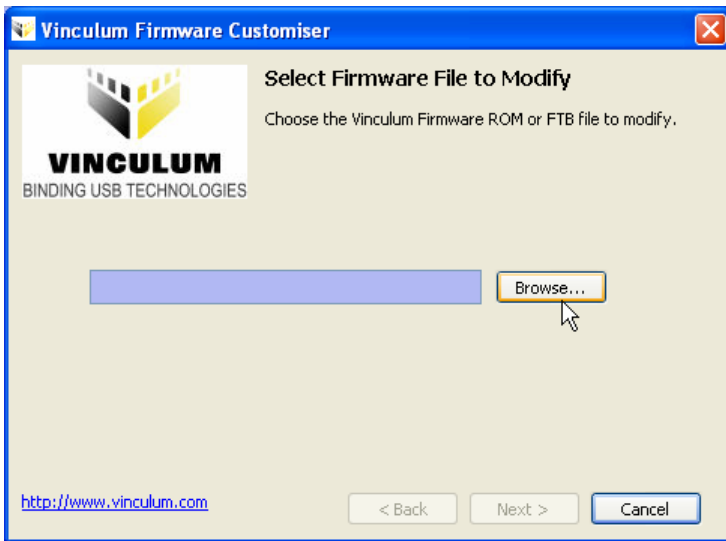


Figure 3.1 Initial Dialog Box

Once a valid file has been selected the “Next >” button can be pressed (see Figure 3.2) to move onto the next step in the process.

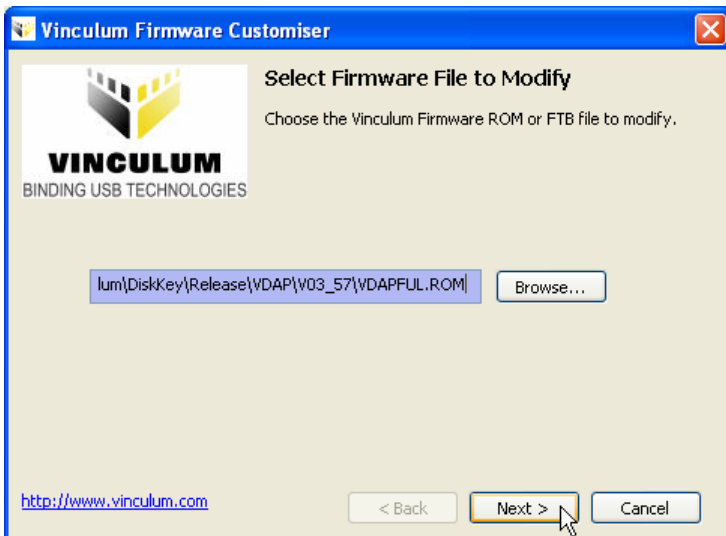


Figure 3.2 Firmware File Selected

3.2.2 Initial Firmware Summary Screen

A summary screen is then displayed which shows the version number, firmware type and modifiable settings in the file before any options have been changed. You can return to this screen from any point in the program to check modified settings against the original settings.

There is a “Copy” button which will copy the contents of the summary screen to the clipboard. This will be required by Vinculum Support in cases where issues have been reported in firmware which has been customised. The “Copy” button is highlighted in Figure 3.3.

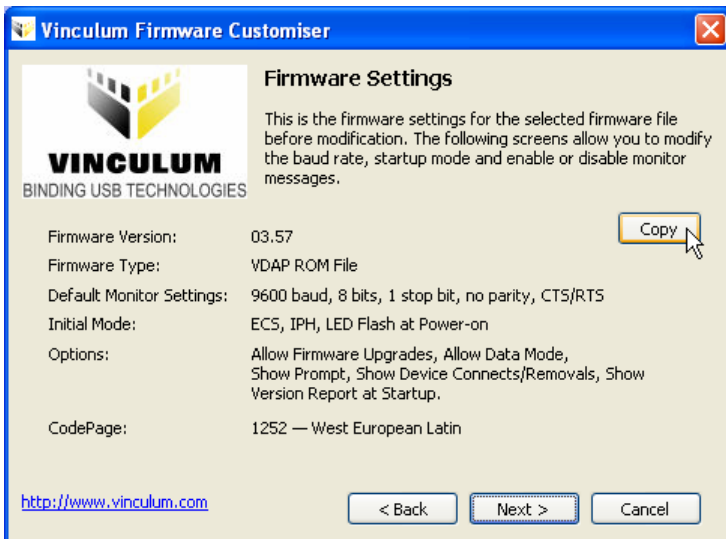


Figure 3.3 Firmware Initial Summary Screen

3.2.3 UART Settings

The first firmware settings screen (Figure 3.4) deals with UART settings for the Vinculum VNC1L Monitor. The default firmware will always be 9600 baud, 8 bits, 1 stop bit, no parity and CTS/RTS enabled.

The Monitor will be configured with these settings at start up when it is active in UART mode. None of these settings are applicable to the Monitor in SPI or Parallel FIFO mode.

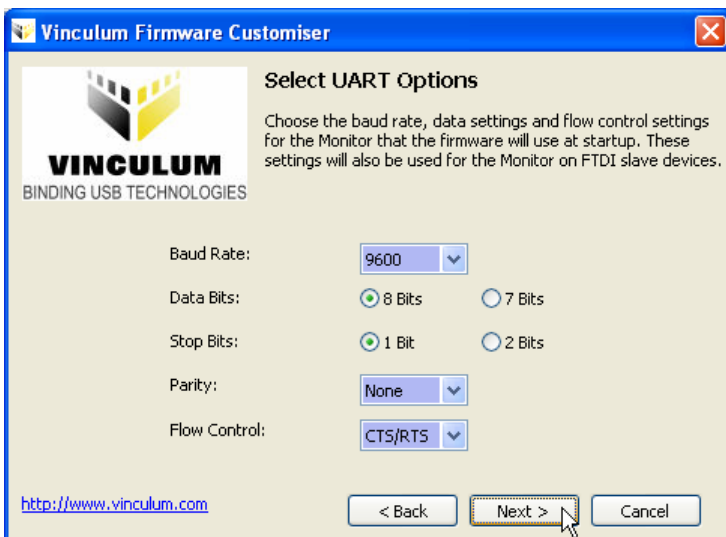


Figure 3.4 Firmware UART Settings Screen

The UART settings on this screen are also used to initialise the Monitor port on USB Port 1 on VDIF firmware. These settings do not affect the default baud rate of the bootloader.

3.2.4 Initialisation Options

Normally the Vinculum VNC1L will initialise with the Monitor set to Extended Command Set mode with Binary Input Mode. In certain applications it may be preferable to start the Monitor in Short Command Set or ASCII Input Mode.

Another option is to disable the LED flash sequence which occurs before the Monitor activates. This sequence is designed solely to indicate that the device is active and may be disabled by unchecking the “LEDs Flash at Power-on” box (See Figure 3.5). This will reduce the time taken for the Monitor to become active allowing commands to be accepted sooner.

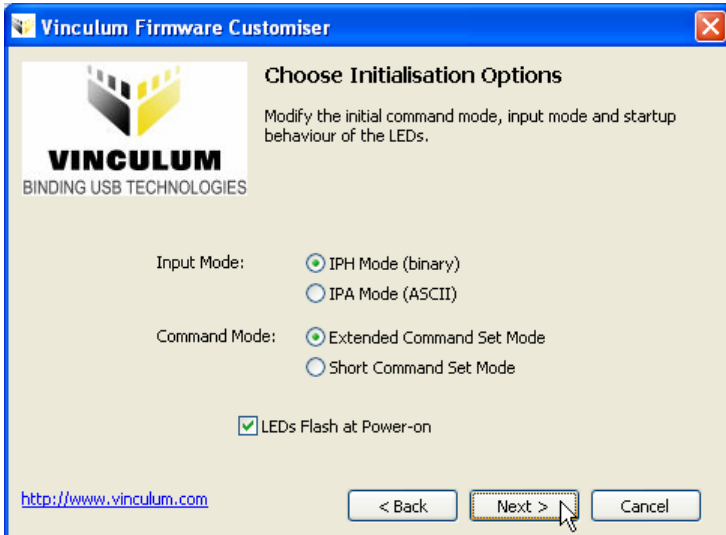


Figure 3.5 Firmware Initialisation Options Screen

3.2.5 Monitor Options

There are configurable options which tell the Monitor to display a class of message or allow an operation to take place. Options are shown in Figure 3.6.

Note: Disabling Firmware Upgrades will only prevent firmware upgrades from Flash Disk. Upgrades performed by the VPROG application will still be possible.

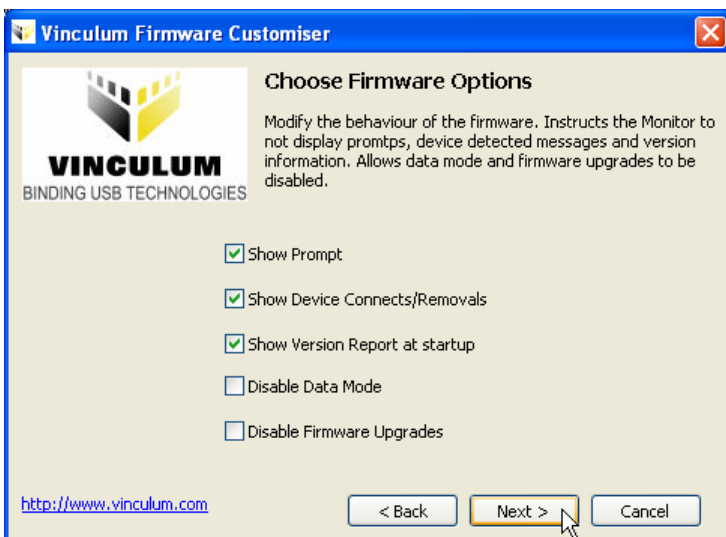


Figure 3.6 Firmware Monitor Options Screen

3.2.6 USB Slave Options

The VDPS Firmware can act as a USB Slave device. The option screen in Figure 3.7 allows the VID and PID to be modified. Values are entered in hexadecimal format without a leading '0x'.

Note: This will determine the driver loaded to communicate with the Vinculum VNC1L in Slave mode.

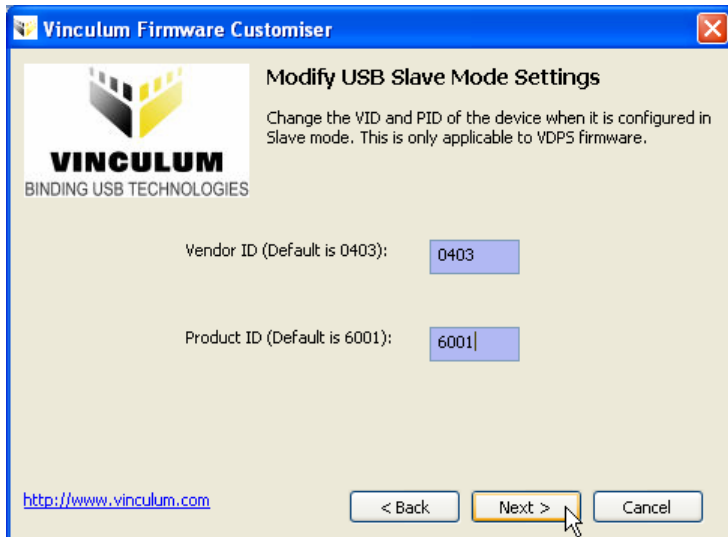


Figure 3.7 Firmware USB Slave Options Screen

The default VID and PID for the Vinculum VNC1L is 0x0403 and 0x6001 respectively.

3.2.7 Code Page Select

FAT filename must be stored in upper case. The Monitor changes lower case characters to upper case using a code page. This code page may be changed to support languages where there are upper case conversions outwith the range of ASCII characters. The standard code set is West European Latin; East European Latin, Cyrillic, Greek and Turkish character sets are currently supported. The selection screen is shown in Figure 3.8.

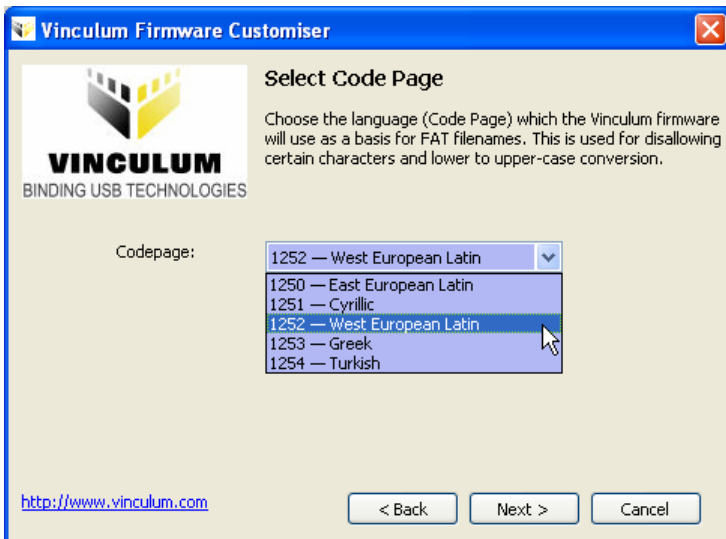


Figure 3.8 Firmware Code Page Screen

3.2.8 Version Code

All firmware modified with the Customiser tool is labelled with a three letter code which identifies the code as modified and allows the modifier of the code to keep track of changes. The screen in Figure 3.9 shows a code of “123” applied to the firmware image. Only upper case letters and numbers may be used to make up the code. The “Next” button is enabled only when the version code has been entered.

Note: This step must be completed. The image will not be written to disk without this code.

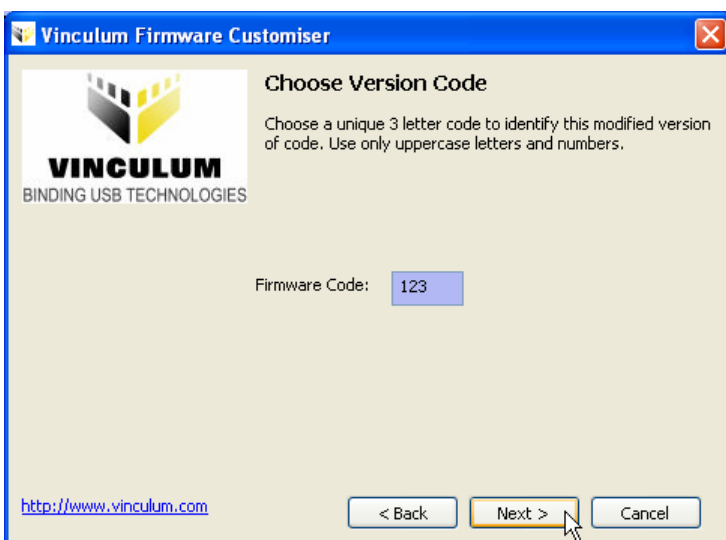


Figure 3.9 Firmware Unique Version Code Screen

3.2.9 Final Firmware Summary Screen

A modified firmware summary screen, similar to that described in Section 3.2.2, is shown. This allows the changes made to the firmware to be reviewed before writing the changes to disk. An example is given in Figure 3.10.

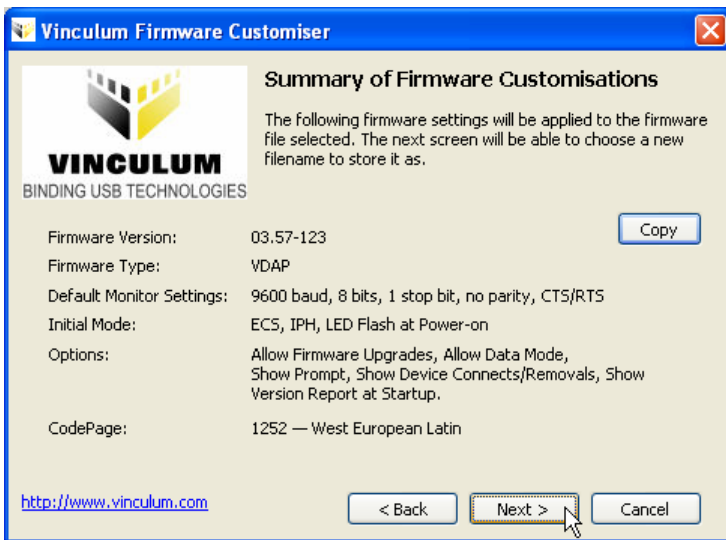


Figure 3.10 Firmware Final Summary Screen

3.2.10 Writing Firmware Files

The modified firmware can be written in FTD or ROM format. The “Save as Type...” drop down box on the Save File dialog can be used to specify either format. Click on the “Browse...” button to access the Save File dialog. See Figure 3.11.

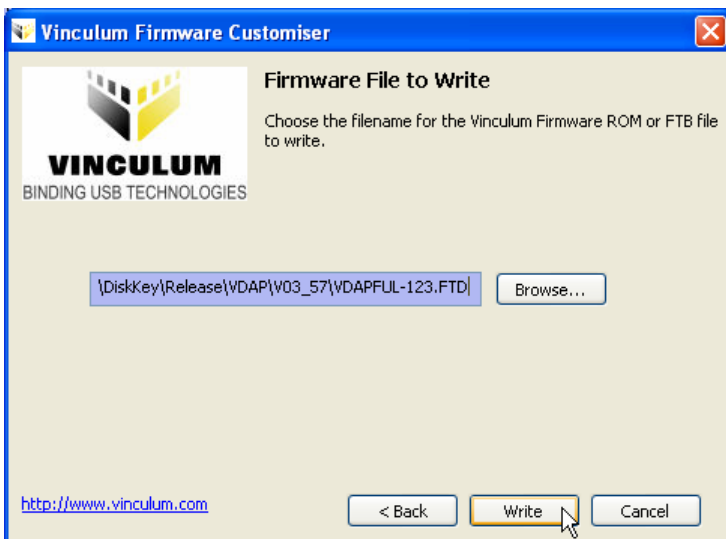


Figure 3.11 Firmware Write File Screen

When the file has been written to the disk the final confirmation screen in Figure 3.12 will be shown.

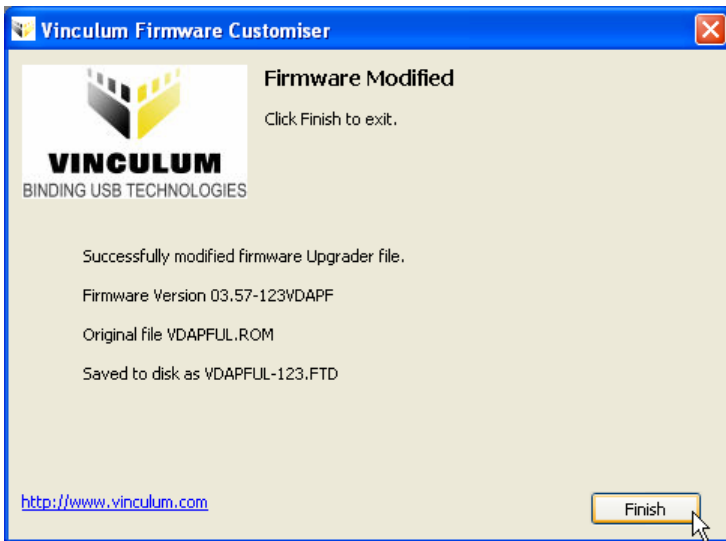


Figure 3.12 Firmware Confirmation Screen

4.0 Troubleshooting

The following section should be consulted if you are having problems with the Vinculum VNC1L firmware. Please consult the FAQ section on the Vinculum Website.

4.1 USB Slave VID and PID

The USB Slave VID and PID screen only appears if the application detects that the firmware is VDPS firmware. The screen will be skipped for all other firmware types.

5.0 Contact Information

Head Office - Glasgow, UK

Future Technology Devices International Limited
373 Scotland Street
Glasgow G5 8QB
United Kingdom

Tel: +44 (0) 141 429 2777
Fax: +44 (0) 141 429 2758
E-Mail (Sales): vinculum.sales@ftdichip.com
E-Mail (Support): vinculum.support@ftdichip.com
E-Mail (General Enquiries): admin1@ftdichip.com
Web Site URL: <http://www.vinculum.com>
Web Shop URL: <http://apple.clickandbuild.com/cnb/shop/ftdichip>

Branch Office - Taiwan

Future Technology Devices International Limited (Taiwan)
4F, No 16-1, Sec. 6 Mincyuan East Road
Neihu District
Taipei 114
Taiwan, R.O.C.

Tel: +886 2 8791 3570
Fax: +886 2 8791 3576
E-Mail (Sales): tw.sales1@ftdichip.com
E-Mail (Support): tw.support1@ftdichip.com
E-Mail (General Enquiries): tw.admin1@ftdichip.com
Web Site URL: <http://www.ftdichip.com>

Branch Office - Hillsboro, Oregon, USA

Future Technology Devices International Limited (USA)
7235 NW Evergreen Parkway, Suite 600
Hillsboro, OR 97124-5803
USA.

Tel: +1 (503) 547-0988
Fax: +1 (503) 547-0987
E-Mail (Sales): us.sales@ftdichip.com
E-Mail (Support): us.support@ftdichip.com
E-Mail (General Enquiries): us.admin@ftdichip.com
Web Site URL: <http://www.ftdichip.com>

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