



Future Technology Devices International Ltd.

Application Note AN_176

Vinculum

Comparison of VDAP versus V2DAP

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The Vinculum-II (VNC2) is FTDI's second generation USB Host/Device IC in the Vinculum family.

VDAP (Vinculum Disk and Peripheral) is pre-compiled firmware written for the Vinculum-I IC.

V2DAP is equivalent firmware written for the Vinculum II. There are minor differences between VDAP and V2DAP. This application note explains the differences.

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1 Introduction

The Vinculum-II (VNC2) device was designed to provide designers with the ability to write their own firmware specific to their application. However, the need to upgrade from existing Vinculum-I (VNC1L) firmware versions is also apparent. Due to the differences in architecture of both devices, changes were made to the existing VDAP firmware to allow it to run on VNC2. This document explains the differences between the VNC1L firmware VDAP (**VNC1L-VDAP**) and the VNC2 firmware V2DAP (**VNC2-V2DAP**). Hardware differences between VNC1L and VNC2 and explained in a separate application note - [AN_118 Migrating Vinculum Designs From VNC1L to VNC2-48L1A](#).

The V2DAP firmware is not recommended to be used on new designs.

1.1 Acronyms and Abbreviations

Terms	Description
VNC1L	Vinculum-I device
VNC2	Vinculum-II device
VDAP	Vinculum-I Disk and Peripheral firmware
V2DAP	Vinculum-II Disk and Peripheral firmware
ECS	Extended command set

Table 1.1 Acronyms and Abbreviations

1.2 Applicable Documents

[Vinculum-I Data sheet](#)

[Vinculum-II Data sheet](#)

[VNC1L Firmware Manual](#)

[AN_118 Migrating Vinculum Designs From VNC1L to VNC2-48L1A](#)

[AN_156 Vinculum-II ProgLoader And BootLoader Explained](#)

[ANVNC1L-01-VinculumBootloader](#)

2 List of Differences

2.1 Installation

2.1.1 Bootloader commands

VNC1L-VDAP:

VNC1L bootloader commands are explained in the application note [ANVNC1L-01-VinculumBootloader](#)

VNC2-V2DAP:

VNC2bootloader commands are explained in the application note [AN_156_Vinculum-II_ProgLoader_And_BootLoader_Explained](#)

2.1.2 Firmware updates over USB

VNC1L-VDAP: This function is included within the firmware.

VNC2-V2DAP: Not included as part of firmware, refer to [AN_159](#) for further information.

2.1.3 Programming Utilities

VNC1L-VDAP:

[VNC_PROG](#) Programmer for VPROG1

[Vinculum Firmware Customiser](#) utility to customise VNC1L firmware.

VNC2-V2DAP:

[FT_Prog](#) FTDI utility can be used to program ROM files to VNC2 using the UART interface.

[IDE Toolchain](#) FTDI`s VNC2 Integrated Development Environment, V2DAP can be programmed and customised using the tools supplied.

2.2 Operation

2.2.1 Version String

VNC1L-VDAP: When connected to a monitor, the FWV (firmware version) command will return the current version of the firmware (e.g. MAIN 03.68VDAPF).

VNC2-V2DAP: - returns MAINx.yz

This can be changed using the VinUser.exe application tool available within the Vinculum II Toolchain. There are 16 bytes in the bootloader which are reserved for user information. Note that the bootloader is part of the ROM file programmed into the VNC2, see Application Note [AN_156](#).

2.2.2 Space (0x20) character causes prompt in command monitor

VNC1L-VDAP: A space (0x20) character will be ignored if preceding a command in ECS.

VNC2 - V2DAP: A space character after a command will be recognized as a carriage return (0x0D).

2.2.3 I/O Write (IOW) command

VNC1L-VDAP: Unused I/O pin commands, full description available within the [VNC1L Firmware Manual](#)

VNC2 - V2DAP: This command will work correctly only with the VNC2 48 pin and when the IOMUX settings are set to default as defined by the V2DAP source codes supplied with the Tool Chain.

2.2.4 DRD command

V2DAP "DRD" command behavior is different to VDAP.

DRD command will block for 2ms or until data is received from a device. On VNC1L a "Command Failed" error was returned if the device responded with a NAK, on VNC2 the transaction will be retried until data is received or the 2ms timeout is reached.

VNC1L does not handle interrupt endpoints so a bulk read performed on an interrupt endpoint will NAK until data is available, therefore a read will return "Command Failed" on VNC1L until data is received.

Interrupt endpoints on VNC2 block until data is available from the device. This is expected behaviour.

2.2.5 Data mode

VNC1L-VDAP:

Bulk and interrupt endpoints are supported in data mode and command mode.

VNC2 - V2DAP:

When a bulk endpoint is used for data mode, it will block when no data is received from the device. No further data will be sent to the device until data is received. Interrupt endpoints will send data only after data is received from the device but they will typically send data after each polling interval. FT232 devices will have data ready to receive after a configurable time interval, these will work the same as interrupt endpoints. Both bulk and interrupt endpoints are supported in command mode (DRD command).

This is due to the architecture of the V2DAP firmware. If the application required is primarily to perform tasks in data mode then it recommended that a simple application is used to transfer data between the devices rather than V2DAP firmware.

2.3 Configuration utilities

2.4 Use of SPI Interface

The SPI interface differs from most other implementations in that it uses a 13 clock sequence to transfer a single byte of data.

VNC1L-VDAP:

VNC1L waits for the chip select line to go active and then the start bit must be a '1' for the transaction to begin.

VNC2 - V2DAP:

In VNC2 backward compatibility mode, the chip waits for the chip select to go active and then counts the next 12 clocks as the full transmission. The start bit is effectively a "don't care" state. Therefore do not pad the SPI with leading 0's. Designers must use the exact number of clock cycles.

If the SPI interface is accessed by the external controller (master) by bit-banging the SPI bits of the interface there will be no new problems.

2.5 Support for different chip packages

When upgrading from VNC1L to VNC2 it is recommended to select the VNC2 - 48 pin package. VNC1L is only available in a 48 pin package and the firmware was written to utilise the I/O's available to that package.

VNC1L-VDAP: Compatible with VNC1L 48 pin package.

VNC2 - V2DAP: Compatible with 48 and 64 pin VNC2 packages. Limited range of functions with 32 pin package.

3 Contact Information

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Appendix A - Revision History

Revision History

Version 1.0	Initial Release	22-06-2011
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