



# Virtual To Virtual GPS Users Guide and Reference

for Windows XP, Windows 2000, and Windows NT  
Constellation Data Systems, Inc.  
[www.VirtualPeripherals.com](http://www.VirtualPeripherals.com)

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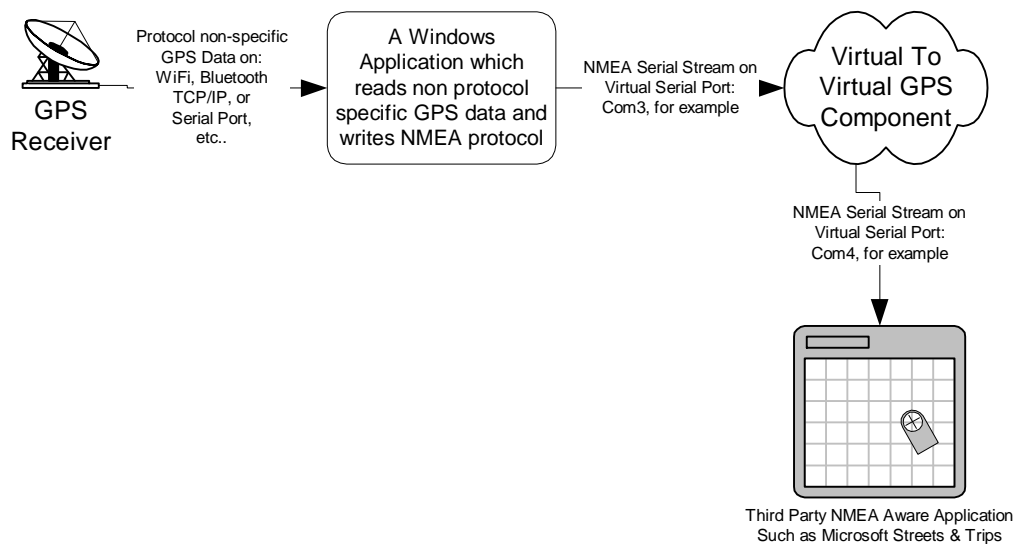
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# 1. Introduction

The Virtual To Virtual GPS component is a powerful pre-built Virtual Serial Port (VSP) application. Many users will be able to use this utility in stand-alone form. Other users, with more complex, custom requirements may wish to consider developing custom applications using the VSP Software Development Kit (VSP SDK).

Consider the following data flow diagram which illustrates the basic data flow of a system using Virtual To Virtual GPS as a component:

Virtual To Virtual GPS  
Typical Data Flow Diagram



## 1.1 Overview

Virtual To Virtual GPS demonstrates the techniques of taking GPS data, i.e. NMEA protocol sentences, from a single Virtual Serial Port (VSP) and replicating that GPS data onto another Virtual Serial Port. Virtual To Virtual GPS also re-structures corrupt NMEA protocol sentences and restores the necessary timing relationships.

## 1.2 Capabilities

- A Virtual “NULL MODEM”; capable of replicating GPS data from a single Virtual Serial Port source onto another Virtual Serial Port.
- NMEA protocol compliant
- Hardware-less serial port replication.
- Easy capture of data from a serial port.
- High speed data transfers / transmissions.
- Serial device simulation.
- Serial port data redirection and device simulation.

## 2. Installation Instructions

In overview, the installation consists of installing Constellation Data System's VSP Framework Core product, which can be downloaded from [www.VirtualPeripherals.com/VspDownload.htm](http://www.VirtualPeripherals.com/VspDownload.htm).

The VSP Core Users Guide and Reference Manual, which describes the VSP Core's installation and operation, can also be downloaded from [www.VirtualPeripherals.com/VspDownload.htm](http://www.VirtualPeripherals.com/VspDownload.htm). Be sure to review this document prior to installation and use.

After the core product is installed,

1. The setup executable is named using the following nomenclature: "VirtualSerialXXX.exe", where XXX is a short version description embedded in the file name. For example, version 2.27 of the Core VSP, XXX would be 227, and the entire module would be named "VirtualSerial227.exe". Run this executable.
2. After running the "VirtualSerialXXX.exe" executable, you will be prompted for the "Unzip To Folder". The folder "c:\VirtualSerial" is recommended. You will then be prompted to run "setup.exe". You should run that component.
3. After running "setup.exe" an Install Shield script will walk you through a number of rather straight-forward dialog boxes. For more detailed installation instructions, please refer to the *VSP Core Users Guide*.
4. After Installation is complete, you should create 2 serial ports (see Add Port Utility).
5. After placing the Virtual To Virtual GPS utility executable in the VSP installation directory (c:\VirtualSerial\exe), you may then run Virtual To Virtual GPS utility from a Windows Command Prompt.

### 3. Virtual To Virtual GPS Users Guide

Virtual To Virtual GPS sends GPS data received from one Virtual Serial Port to another, and visa-versa. It is simply a “high tech” null modem for virtual serial devices.

Important:	<p>It is important that the source of the NMEA data be correctly identified (the first parameter) to V2VGPS (see below). The serial port which acts as the destination (where an application such as Microsoft’s Streets and Trips would connect), should be identified as the second parameter to V2VGPS (see below).</p> <p>Switching the two ports as parameters to V2VGPS will cause improper behavior.</p>
Note:	<p>Many serial port aware applications, such as Microsoft’s Streets and Trips will only function on ports named COM1, COM2, COM3, or COM4.</p>

#### 3.1 Command Line Parameters of Virtual To Virtual GPS

Consider the following syntax mapping:

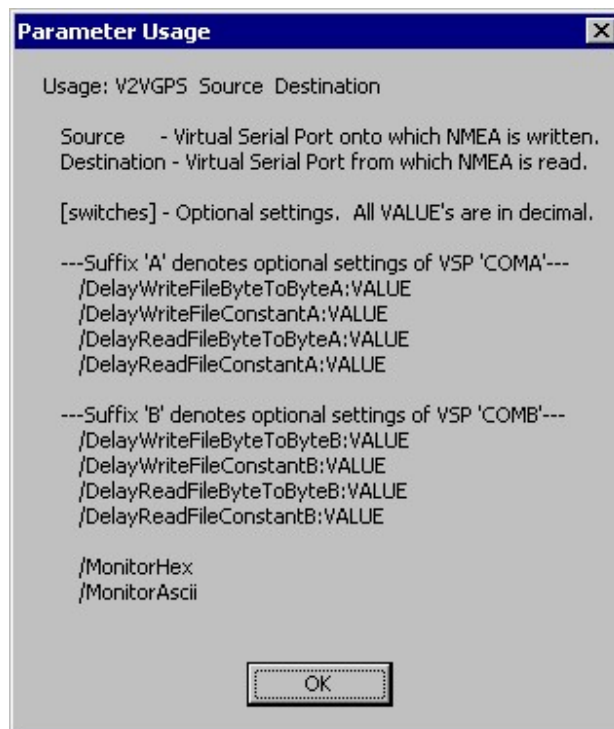
<p><b>Syntax</b></p>	<p><b>V2VGPS</b> Source Destination [switches]</p> <p>Source ----- Virtual Serial Port which receives the NMEA stream.</p> <p>Destination ----- Virtual Serial Port where an application such as Microsoft Streets &amp; Trips would connect.</p> <p>[switches] – Optional settings. All VALUE's are in decimal.</p> <p>/DelayWriteFileByteToByteA:VALUE /DelayWriteFileConstantA:VALUE /DelayReadFileByteToByteA:VALUE /DelayReadFileConstantA:VALUE</p>
----------------------	---

	<p>/DelayWriteFileByteToByteB:VALUE /DelayWriteFileConstantB:VALUE /DelayReadFileByteToByteB:VALUE /DelayReadFileConstantB:VALUE</p> <p>/MonitorAscii /MonitorHex</p>
<b>Parameters</b>	<p><b>Source</b> – Data is read from PortA, and written to PortB. <b>Destination</b> – Data is read from PortB, and written to PortA.</p>
<b>Switches</b>	<p><b>/?</b> – Prints command line usage.</p> <p><b>/DelayWriteFileByteToByteA:VALUE</b> – Specifies the amount of time, in milliseconds, to delay between bytes when writing to Source.</p> <p><b>/DelayWriteFileConstantA:VALUE</b> - Specifies a constant amount of time, in milliseconds, to delay between bytes when writing to Source.</p> <p><b>/DelayReadFileByteToByteA:VALUE</b> - Specifies the amount of time, in milliseconds, to delay between bytes when reading to Source.</p> <p><b>/DelayReadFileConstantA:VALUE</b> - Specifies the amount of time, in milliseconds, to delay between bytes when writing to Source.</p> <p><b>/DelayWriteFileByteToByteB:VALUE</b> - Specifies the amount of time, in milliseconds, to delay between bytes when writing to Destination.</p> <p><b>/DelayWriteFileConstantB:VALUE</b> - Specifies a constant amount of time, in milliseconds, to delay between bytes when writing to Destination.</p> <p><b>/DelayReadFileByteToByteB:VALUE</b> - Specifies the amount of time, in milliseconds, to delay between bytes when reading to Destination.</p> <p><b>/DelayReadFileConstantB:VALUE</b> - Specifies a constant amount of time, in milliseconds, to delay between bytes when reading to Destination.</p> <p><b>/MonitorAscii</b> – prints out a data trace on the console in ASCII</p>

	<b>/MonitorHex</b> – prints out a data trace on the console in HEX
<b>Runtime</b>	'A' then 'ENTER' typed on the command line console causes the utility to cancel wait for changes on Source.  'B' then 'ENTER' typed on the command line console causes the utility to cancel wait for changes on Destination.  'Q' then 'ENTER' typed on the command line console causes the utility to quit (exit).

### 3.2 Help Screen

Running "V2vGps.exe" with no parameters will cause the following dialog box to appear.

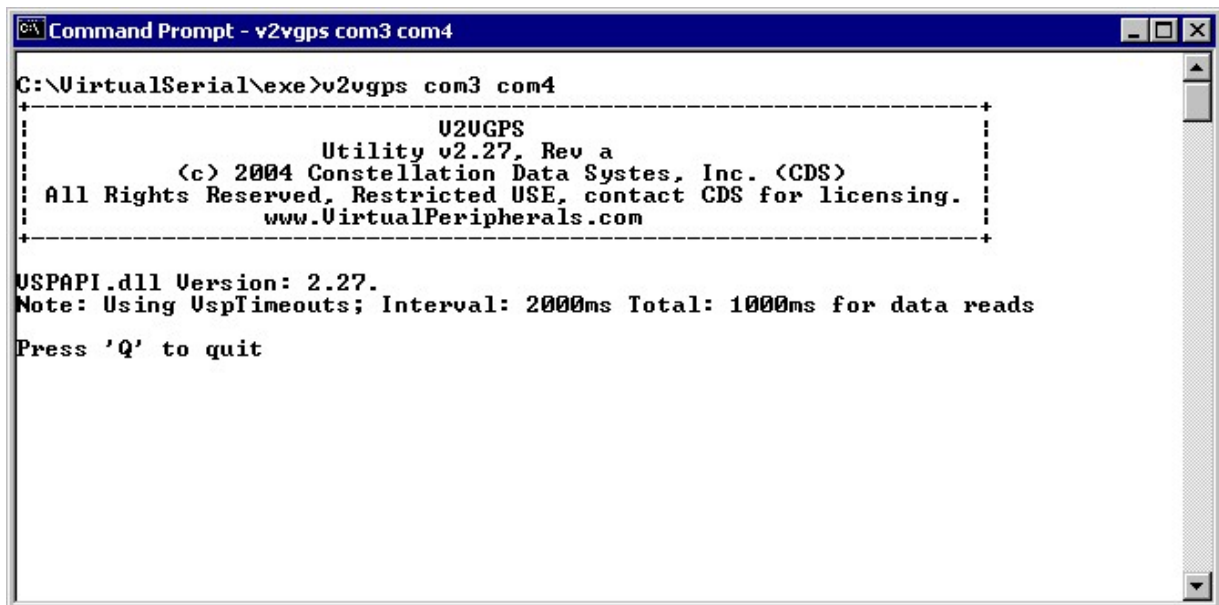


### 3.3 Demonstration Using Virtual To Virtual GPS

In the following example, the Virtual To Virtual GPS utility has been used to connect the Transmit (TX) data of Virtual Serial Port “COM3” with the Receive (RX) data of Virtual Serial Port “COM4”. Additionally, the Transmit (TX) data of Virtual Serial Port “COM4” has been connected with the Receive (RX) data of Virtual Serial Port “COM3”. This is the normal “Full Duplex” usage of the *Virtual To Virtual GPS* utility.

Important:	It is important that the source of the NMEA data be correctly identified (the first parameter) to V2VGPS. The serial port which acts as the destination (where an application such as Microsoft’s Streets and Trips would connect), should be identified as the second parameter to V2VGPS (see below).  Switching the two ports as parameters to V2VGPS will cause improper behavior.
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Consider the following execution which connects the NMEA data written to COM3 (a Virtual Serial Port) to the COM4 (also a Virtual Serial Port). Once executed, a third party application, such as Microsoft’s Streets and Trips may be connected to COM4.



```
Command Prompt - v2vgps com3 com4
C:\VirtualSerial\exe>v2vgps com3 com4
+-----+
+           V2VGPS
+   Utility v2.27, Rev a
+   (c) 2004 Constellation Data System, Inc. (CDS)
+   All Rights Reserved, Restricted USE, contact CDS for licensing.
+   www.VirtualPeripherals.com
+-----+
USPAPI.dll Version: 2.27.
Note: Using UspTimeouts; Interval: 2000ms Total: 1000ms for data reads
Press 'Q' to quit
```

The Virtual To Virtual GPS utility continues to operate until ‘Q’ and ENTER are typed on the console. This causes a QUIT operation and Virtual To Virtual GPS will gracefully shutdown and say “.... Goodbye ....”.

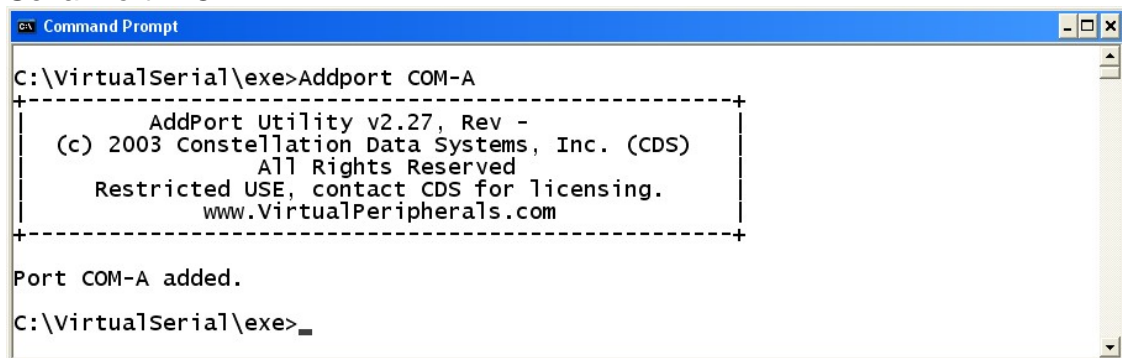
## 4. Supplemental VSP Utilities

### 4.1 Add Port Utility

The *Add Port* (“addport.exe”) utility creates a Virtual Serial Port. The VSP name will be the same name that applications, such as HyperTerminal use to identify the VSP device. If a port with the selected name already exists, a message will appear which explains why the Virtual Serial Port could not be created.

#### 4.1.1 Demonstration of *Add Port*

In the following example, the *Add Port* utility has been used to create/add a Virtual Serial Port “PORTA”.



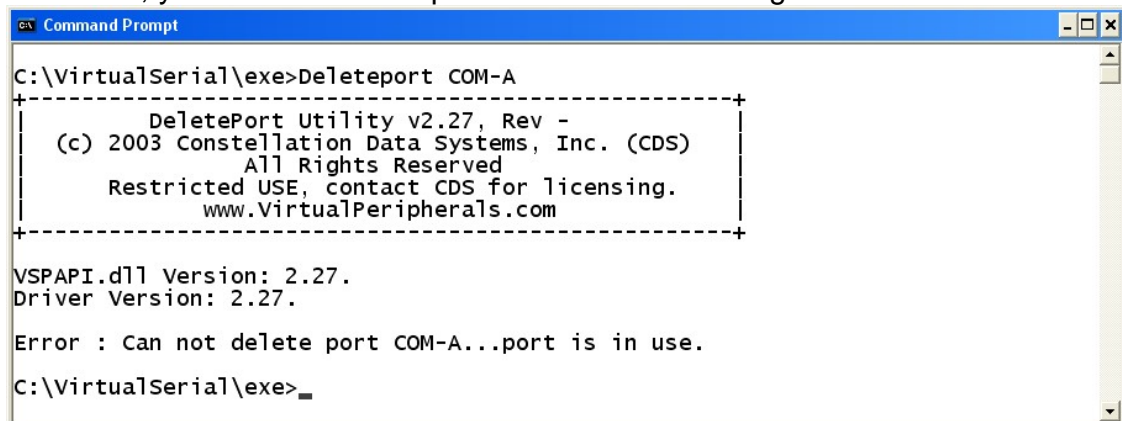
```
Command Prompt
C:\VirtualSerial\exe>Addport COM-A
+-----+
|          AddPort Utility v2.27, Rev -          |
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|                All Rights Reserved                |
|    Restricted USE, contact CDS for licensing.        |
|                www.VirtualPeripherals.com          |
+-----+
Port COM-A added.
C:\VirtualSerial\exe>
```

### 4.2 Delete Port Utility

The *Delete Port* (“deleteport.exe”) utility deletes a Virtual Serial Port. The VSP name will be the same name that applications, such as HyperTerminal, use to identify the VSP device.

If a port with the selected name is currently in use, a message will appear which explains why the Virtual Serial Port could not be deleted. Should a virtual serial port device be locked by another component then the utility may fail. Should the device

be locked, you will observe output similar to the following:



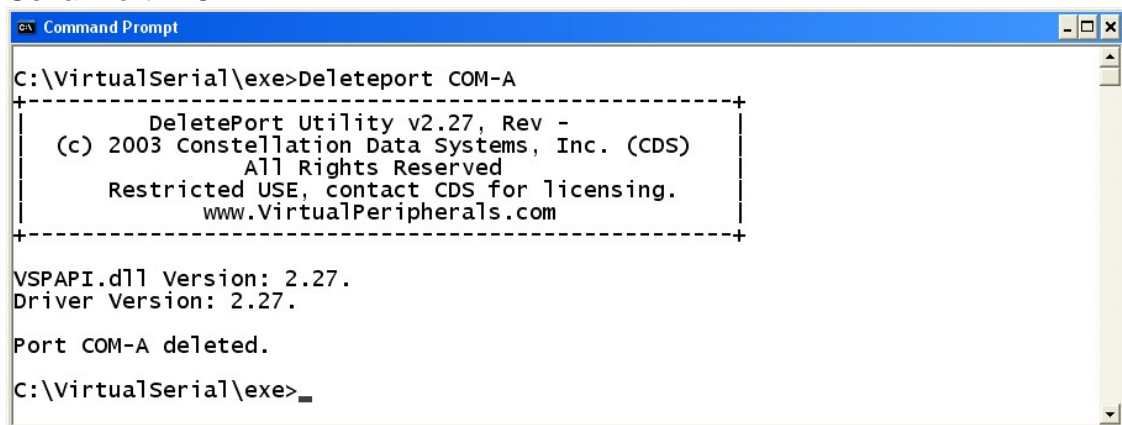
```
Command Prompt
C:\VirtualSerial\exe>Deleteport COM-A
-----
DeletePort Utility v2.27, Rev -
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All Rights Reserved
Restricted USE, contact CDS for licensing.
www.VirtualPeripherals.com
-----
VSPAPI.dll Version: 2.27.
Driver Version: 2.27.

Error : Can not delete port COM-A...port is in use.
C:\VirtualSerial\exe>
```

To clear this condition, free the device, in this case by simply closing the application (such as HyperTerminal), which is connected to the Virtual Serial Port.

#### 4.2.1 Demonstration of *Delete Port*

In the following example, the *Delete Port* utility has been used to delete a Virtual Serial Port "PORTA".



```
Command Prompt
C:\VirtualSerial\exe>Deleteport COM-A
-----
DeletePort Utility v2.27, Rev -
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Restricted USE, contact CDS for licensing.
www.VirtualPeripherals.com
-----
VSPAPI.dll Version: 2.27.
Driver Version: 2.27.

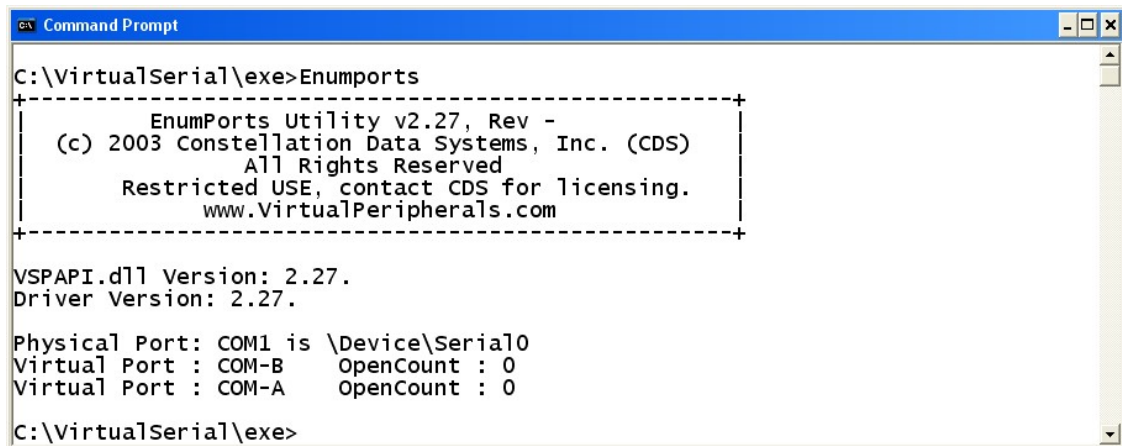
Port COM-A deleted.
C:\VirtualSerial\exe>
```

### 4.3 Enum Ports Utility

The *Enum Ports* ("enumports.exe") utility enumerates all Virtual and Physical Serial Ports on a system.

#### 4.3.1 Demonstration of *Enum Ports*

In the following example, the *Enum Ports* utility has been used to enumerate all Virtual and Physical Serial Ports.



```
Command Prompt
C:\VirtualSerial\exe>Enumports
+-----+
|           EnumPorts Utility v2.27, Rev -           |
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|           All Rights Reserved                      |
|           Restricted USE, contact CDS for licensing. |
|           www.VirtualPeripherals.com              |
+-----+
VSPAPI.dll Version: 2.27.
Driver Version: 2.27.
Physical Port: COM1 is \Device\Serial0
Virtual Port : COM-B   OpenCount : 0
Virtual Port : COM-A   OpenCount : 0
C:\VirtualSerial\exe>
```

## 5. Virtual To Virtual GPS Custom Programming

To start developing customized VSP applications, download and refer to the VSP SDK Programmers Guide and Reference from <http://www.virtualperipherals.com/VspDownloads/VSPSoftwareDevelopmentKit.pdf>.

### 5.1 Virtual To Virtual GPS Sample Reference Design (C/C++)

The source code for Virtual To Virtual GPS may be licensed from Constellation Data Systems (CDS). Please contact CDS sales for more information.

## 6. Notices

Use of this software, information, or technology in a system, or as a component of a system, which can through action or inaction, cause damage to life, limb, property, or the environment is not authorized. Use of this software is also subject to the terms and conditions of the Software License Agreement with CDS that you accepted at time of installation.

This manual, information, technology and software are protected by copyright law and international treaties. Unauthorized reproduction or distribution may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent of the law.

## 7. Index of Acronyms and Abbreviations

API	Applications Programming Interface
CDS	Constellation Data Systems
DCB	WIN32 Device Control Block
GPS	Global Positioning System
HyperTerminal	Standard Windows Communications Application
MS	Microsoft
NMEA	National Maritime Electronics Association
RS-232	Recommended Standard 232 (from the Electronics Industry Association) for data communications
RX	Receive
SDK	Software Development Kit
TBD	To Be Described / To Be Determined
TLA	Three Letter Acronym
TX	Transmit
VSP	Virtual Serial Port
VSP API	Virtual Serial Port Applications Programming Interface
WIN32	Windows 32 Bit Programming Paradigm