8 Vehicle Spy Text API

目标

Text API 目的是提供一种基于文本的简单命令集，在 Vehicle Spy 3 中可让第三方的应用程序在不需要重写很多代码的情况下，利用 Vehicle Spy 的强大功能。

Text API 命令集是基于文本的，所以很容易地运行在很多接口上面，如 RS232，USB，Ethernet 或 Wireless。它也独立于主机的操作系统或开发环境。命令集类似于可编程设备中的命令与反馈等。

您可轻松地基于 Text API 写一个对象或者函数封装器（Function wrapper）。这使得允许方便地使用专业的语言，例如 C#，Java，Visual Basic，Labview 或 C++。Text API 本身也可作为一种宏语言。

学习技巧

学习 Text API 最好的方法就是实验。Vehicle Spy 中的 Text API 终端就是实现此目的最好工具。另外，因为大多数的命令都是基于 XML 标记的，您只需在文本编辑器中打开 vs3 文件就可看到通过这个极其灵活的 API 所能操作的属性。

规则总结

*所有命令以默认的根对象（root object）开始。

*命令以<CR>，<LF>或者<CR><LF>结合体作为分隔符。

*命令大小写不敏感。如果参数是基于文本的，如描述属性，可能大小写敏感。

*所有对象和属性有相同的文本作为他们的 XML 元素名称。可通过调用属性并提供参数更改属性。属性值也可通过使用问号“？”询问后返回得到。

如下规则目前暂不支持

*支持非 ASCII 码、扩展字符、%转义字符和;注释字符都有专门的编码。%出现的地方后面会跟有 4 个十六进制格式的文本数字。例如，%000D 等于<CR>，%000A 等于<LF>。4 个数字文本允许 Unicode 支持文本参数，例如描述等。

*注释字符是分号，在分号后面所有字符都被忽略直到下一行命令。

*通过 Vehicle Spy 3 的 DLL，可以以 Unicode 方式访问 Text API。

命令与查询

基本通信包括命令和查询：命令用于设置属性或者执行方法，查询用于请求属性。

命令和查询将会返回两个可能回复中的一种：ok 或 er。ok 意味着命令成功执行，er 意味着命令执行有问题。ok 后面会跟有文本，显示了完成的命令以及返回值。

也可利用方法（method）询问事件（Events），事件也可异步地显示在接受流中。您必须指定，或者注册（Register）您想接收的事件。

命令（Command）、查询（Queries）和事件（Events）语法

表 8-1 命令、查询和事件语法

类型	命令语法	成功返回语法
Command	*methodname* {arguments}	ok *methodname*
Queries	*methodname*?	ok *methodname* {propertyvalue}

示例

执行成功的 start 命令

Host： Start

Vehicle Spy 3： ok start

执行不成功的根命令

Host： Startasdf

Vehicle Spy 3： er command not found:startasdf

执行成功的查询

Host： AutoDetectHardware?

Vehicle Spy 3： ok autodetecthardware 1

示例：LoadFile 方法

This command starts with root object and ends with a carriage return.

Host: loadfile text.vs3<CR>

Vehicle Spy 3: ok loadfile

neoVI PRO Text API

neoVI PRO 支持两种 API：第一种是 Text API，第二种是 neoVI RAW API。Text API 是在 USB，COM 和 Ethernet（通过 TCP）端口上的默认 API。因此，这里所有的 Text API 命令可工作在执行在 neoVI PRO 上的 Vehicle Spy 3 代码上。

使用 Text API

如下列表展示了您如何与 Text API 交互，如表 8-2 所示。

表 8-2 与 Text API 交互方式

Application	Source	Comment
Vehicle Spy 3	Text API Terminal	Allows you to manually type in Text API commands and see their responses.
Vehicle Spy 3	Function Blocks	Allows you to send and receive Text API commands.
Vehicle Spy 3	Java	The Java Environment interacts with Vehicle Spy via the Text API.
Vehicle Spy 3	Via COM or TCP port	Vehicle Spy 3 can act as a COM or TCP server. Setup via Tools/Options.
neoVI PRO	neoVI PRO setup	The neoVI PRO setup allows you to send commands to neoVI PRO on the control panel.
neoVI PRO	via USB, COM and TCP ports	
neoVI PRO	Java or Function Block scripts	

DLL	The TextAPI method of the icsneo40.dll	Not yet supported.

根对象（Root Objects）

如表 8-3 所示。

表 8-3 根对象

Command Name	Description	Example
Root Objects for Application Signals		
all?	returns all application signals that are not remote signals in a key=value comma separated string. This is used to efficiently read all app signals over a slower network.	all?
allsetup?	returns all application signals that are not remote signals in a key=description comma separated string. This is used to efficiently read all app signals descriptions over a slower network.	
apprestore	Restores application signals from disk.	
appsave	Saves application signals to disk. Application Signals must be enabled for saving. Signals are saved in a file in the same path as the vs3 file. {vs3 file name}.appini	
as	Accesses the collection of Application Signals. See the topic on Collection Objects.	
as(index or key)	Accesses a specific application signal by an index or a key. Set the topic on Signal objects.	
Root Objects for Diagnostic Jobs		

dg	Accesses a specific diagnostic jobs by an index or a key.	dg(0).start ;starts a diag job.
Root Objects for Files and Paths		
copyfile	Copies a file in the data directory to another in the data directory.	
deletefile	Removes a file in the data directory.	
dir	Returns the files in the root of the compact flash card or the Vehicle Spy data directory. A filter spec determines which files to return.	dir? *.*
diskspace	returns the amount of diskspace both available and total in kilobytes.	diskspace?
filedetails	Returns information size, time/date on a file in the data directory/neoVI PRO compact flash card.	filedetails? test.vs3
loadfile	Loads a setup file from the data directory.	loadfile test.vs3
renamefile	Renames a file in the data directory.	
status	Returns the loaded file and whether the file is running.	status?
Root Objects for Function Blocks		
fb	Accesses the collection of Function Blocks. See the topic on Collection Objects.	fb.count? ;asks for the number of function blocks
fb(index or key)	Accesses a specific function block by an index or a key. Set the topic on function block objects.	fb(1).start ;starts the first function block. fb(tst2).stop ;stops the function block with key tst2.
Root Objects for GPS or Joystick		
gps	Accesses the GPS object.	gps.latitude? gps.longitude? gps.altitude?

		gps.speed? gps.isvalid?
JoystickEnabled	Indicates whether the joystick is enabled or not.	
JoystickSelected	Indicates which joystick is used.	
Root Objects for Graphical Panels or User Interface		
gp(index or key)	Graphical Panel objects.	
gp(index or key).all?	returns all graphical panel control values in a key=value comma separated string. This is used to efficiently read all graphical panel data over a slower network.	gp(dia1).all?
gp(index or key).allsetup?	returns the graphical panel as an XML string.	
gpallsetup?	returns all graphical panels in a key=description comma separated string. This is used to efficiently read all panel descriptions over a slower network.	
ui	Controls the user interface of neoVI PRO. Described in a separate topic.	
Root Objects for Hardware		
ao	Accesses a specific analog outputs by an index or a key. See the topic on transmit message objects.	ao(0).value 3.42
id	Returns the current neoVI PRO firmware ID.	id? ;get the neoVI PRO ID.
io0isoutput or io1isoutput	Returns/Sets whether MISC1 pin is an output or input.	io0isoutput 1 ;make MISC1 and output
io0value	Returns/Sets the value of the MISC 1 pin on neoVI PRO on the DB15 connector.	io0value?
io1value	Returns/Sets the value of the MISC 2 pin on neoVI PRO on	io1value 1

	the DB15 connector.	
ixcbusenabled	Returns/Sets whether the ixcbus is enabled.	
ixcbusnetwork	Returns/Sets the network where the IXCBus protocol is used.	
Root Objects for J1939		
j1939dm1srcall	Returns a comma separated list of SRC addresses that have active DTC's	j1939dm1srcall?
J1939dm1src(address)	J1939 Object; also returns list of DTCs for specified address	j1939dm1src(0)?
Root Objects for Messages		
mg	Accesses the collection of Messages. See the topic on Collection Objects.	
mg(index or key)	Accesses a specific message object by an index or a key. See the topic on message objects.	mg(0).clearstats ;clears the stats of first msg
tx	Accesses the collection of Transmit Messages. See the topic on Collection Objects.	tx.add ;adds a message at the end of the collection and returns new key
tx(index or key)	Accesses a specific transmit message by an index or a key. See the topic on transmit message objects.	tx(1).Arbid 234 ;sets the arb id in hex
Root Objects for Simulation		
ecu	Accesses the ecu subobject. This is discussed in a separate topic.	
SimulationEnabled	Sets/Returns whether simulation is used or you are connecting to hardware.	
SimulationPath	Sets/Returns the path of the file used for simulation mode.	
Root Objects for Vehicle Spy		
AutoDetectHardware	Sets whether Vehicle Spy will	AutoDetectHardware

	detect hardware or not.	1 ;sets hardware to autodetect. AutoDetectHardware? ;asks for the autodetect setting.
isrunning	Returns whether if Vehicle Spy is running or not.	isrunning?
Start	Starts Vehicle Spy.	
Stop	Stops Vehicle Spy.	
timedate	Returns/Sets the time date of the clock.	timedate?

模拟输出对象（Analog Output Objects）

表 8-4 模拟输出对象

Command Name	Description	Example
calculatefromsignal	Returns/Sets whether analog outputs are automatically calculated using busdecoder mode or can be set via the Text API. The power default is automatically calculated.	ao(0).calculatefromsignal 0 ;allow manual control
EnableCalibratedValues	Returns/Sets whether analog outputs are scaled according to the calibration scaling. Disable this feature to perform calibration.	ao(0).EnableCalibratedValues 0 ;disable for calibration
messagekey	Returns/Sets the key of the message attached to this analog output.	
signalkey	Returns/Sets the key of the signal attached to this analog output. This is used in conjunction with signal key.	
value	Returns/Sets the value of the output. This is only valid if calculatefromsignal is false.	ao(0).value 3.21 ;sets output to 3.21V

采集对象（Collection Objects）

表 8-5 采集对象

Command Name	Description	Example
Additem	Adds an item to the end of the collection.	fb.additem ;adds an item to the end of the collection.
Count	Indicates how many items in the collection. Read only.	tx.count? ;how many tx messages are defined?
DeleteAllObjects	Removes all items from the collection.	as.deleteallobjects ;remove all of the app signals.
KeyExists	Determines if the specified key exists in the collection.	tx.keyexists out0 ;does this key exist in the collection?
ReturnIndexFromKey	Finds the key in the collection and returns the index. If the key is not found it returns -1.	tx.returnindexfromkey out0

Function Block 对象（Function Block Objects）

表 8-6 Function Block 对象

Command Name	Description	Example
save	Saves the function block data.	
start	Starts the function block.	fb(0).start ;starts the first function block.
stop	Stops the function block.	
trigger	Triggers the function block.	

J1939 对象（J1939 Objects）

表 8-7 J1939 对象

Command Name	Description	Example
dtc(code).spn	Returns the SPN number for requested DTC (specified by code)	j1939dm1src(0).dtc(0).spn?
dtc(code).FMI	Returns the FMI number for requested DTC (specified by code)	j1939dm1src(0).dtc(0).fmi?
dtc(code).oc	Returns the OC number for	j1939dm1src(0).dtc(0).co?

	requested DTC (specified by code)	

报文对象（Message Objects）

表 8-8 报文对象

Command Name	Description	Example
ByteStringX	Sets the filter bytes for a network in hex.	mg(0).ByteString0 110
CFTimeOutsMs	Specifies the Consecutive Frame timeout in milliseconds.	
ClearStats	Clears all statistical information associated with the message. Does not clear signal stats.	mg(0).ClearStats
Compile	Compiles filter bytes and equations and then makes changes activate.	
Description {Text Description}	Sets the description for a message.	Set the description for message number 4 as Engine Data: mg(3).description Engine Data<CR>
DisplayColor	Sets/Returns the color the message is displayed with.	mg(0).DisplayColor 0 ;display black
EnableISO15765	This enables long messaging on CAN based off of ISO15765.	
~~EnRxEvent {Return Msg, Return Value, Return Stats}~~		~~.sg(in3433).EnRxEvent~~
ExpectedLength	Sets the expected length of a specific message.	
FlowCArbID	Sets/Returns CAN id used for the flow control frame in iso15765 messaging.	
FlowCBlockSize	Sets/Returns the block sized used in long can messaging.	
FlowCSTmin	Sets/Returns the flow control STMin.	
refresh	Updates message table. This is useful when making changes	mg.refresh

	to messages via text API	
sg	Accesses the collection of Signals. See the topic on collection objects.	
sg(index or key)	Accesses a specific Signal object by an index or a key. See the topic on message objects.	sg(0).value? ;Asks for the Value of the first signal

信号对象（Signal Objects）

表 8-9 信号对象

Command Name	Description	Example
value	Sets/Gets the value.	
Description {Text Description}	Sets the description for a signal.	Set the description for signal number 4 as throttle position: mg(0).sig(3).description Throttle Position<CR>
DisplayColor	Sets/Returns the color the message is displayed.	mg(0).DisplayColor 0 ;display black
Equation	Gets/Sets the equation.	
Format	Get/Sets the equation format.	
refresh	Updates signal information. This is useful when making changes to signals via text API.	

ASCII 图表

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	NUL	SOH	STX	ETX	EOT	ENQ	ACK	BEL	BS	HT	LF	VT	FF	CR	SO	SI
1	DLE	DC1	DC2	DC3	DC4	NAK	SYN	ETB	CAN	EM	SUB	ESC	FS	GS	RS	US
2	SP	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7	p	q	r	s	t	u	v	w	x	y	z	{	|	}	~	DEL

8.1 neoVI Pro 用户界面

目标

利用 UI 对象访问 neoVI PRO 用户界面，语法如下：

```
ui.clear      ; clears the screen
```

neoVI PRO 显示

neoVI PRO 具有一个 128 像素宽，64 像素高的黑白显示屏。UI 命令支持从 0 到 127 的横坐标以及从 0 到 63 的纵坐标。UI 命令支持两种颜色蓝色（1）和白色（0）。可利用 invert 命令（在不同的照明环境中有用）转换颜色。

UI 对象（UI Object）

表 8-10 UI 对象

Command Name	Description	Example

ledpwr	Sets/Clears the neoVI PRO power LED	ui.ledpwr 1 ;// sets the led on
		ui.ledpwr 0 ;// turns led off

clear	Clears the LCD screen	ui.clear ;// clears the LCD screen
line	Draws a line on the LCD screen in a specified color Arguments: **x1,y1,x2,y2,color**	ui.line 0,32,127,32,1 ;// draw a line in the center of the screen
print	Prints Text on the LCD screen in a specified color, size and horizontal alignment. Arguments: **x1,y1,fontsize,alignment, color,{text}** **Font Size:** 0) normal letters (5x8), 1) small letters (Xx5), 2) large (10x16) **Alignment:** 0) no alignment 1) left, 2) center, 3) right. x is ignored for alignments 1 through 3.	ui.print 0,28,0,2,1,Hello neoVI World ;// displays hello world on the screen
rect	Draws a rectangle on the LCD screen with optional fill Arguments: **x1,y1,x2,y2,color,fill**	ui.rect 10,10,30,30,1,0 ;// draw a square on the screen

ledex	Sets/Clears the neoVI PRO exclaim (!) LED	ui.ledex 1 ;// sets the led on
		ui.ledex 0 ;// turns led off

leddb	Sets/Clears the neoVI PRO database LED	ui.leddb 1 ;// sets the led on
		ui.leddb 0 ;// turns led off

buzz	Sets/Clears the neoVI PRO buzzer	ui.buzz 1 ;// turns on buzzer
		ui.buzz 0 ;// turns off buzzer

keys	Returns the key pad state in a bitfield: 1) Up 2) Down 4) Left 8) Right 16) check 32) X 64) O 128) Square 256) Star	ui.keys? ok keys 1 ;// the up buttons is currently pressed
keycheck	Returns and clears the keypress latch This will return 1 if the enter key has been pressed since last time the key was checked.	ui.keycheck? ok keycheck 0
keyleft	Returns and clears the keypress latch This will return 1 if the enter key has been pressed since last time the key was checked.	
keyright	Returns and clears the keypress latch This will return 1 if the enter key has been pressed since last time the key was checked.	
keyup	Returns and clears the keypress latch This will return 1 if the enter key has been pressed since last time the key was checked.	

backlight	Sets/Clears the neoVI PRO backlight	ui.backlight 1 ;// turns on backlight
		ui.backlight 0 ;// turns off backlight

invert	Allows you to invert the colors on the display.	ui.invert 1 ;// invert on
		ui.invert 0 ;// invert off

dbitmap	Draws a bitmap **x1,y1,widthinpixels,heightinpixels,{csv hex bitmap}**	ui.dbitmap 0,0,4,8,FF,FF,FF,FF ;// draws a block of pixels
keydown	Returns and clears the keypress latch This will return 1 if the enter key has been pressed since last time the key was checked.	
keyo	Returns and clears the keypress latch This will return 1 if the enter key has been pressed since last time the key was checked.	
keystar	Returns and clears the keypress latch This will return 1 if the enter key has been pressed since last time the key was checked.	
keybox	Returns and clears the keypress latch This will return 1 if the enter key has been pressed since last time the key was checked.	
Circle	Draws a circle on the display Arguments: **x,y,radius, color**	ui.circle 30,30,5,1
Pixel	Draws a pixel on the display Arguments: **x,y,color**	ui.pixel 30,30,1 ;// set pixel to blue
operatingmode	Gets/Sets the operating mode of the display and neoVI PRO: 0) Bus Decoder Normal 1) Bus Decoder J1979	ui.operatingmode 3 ;// switch to custom mode

	2) Vehicle Spy Mini Mode 3) Custom 4) Diag Tool 5) Test and Debug	
keyx	returns and clears the keypress latch This will return 1 if the enter key has been pressed since last time the key was checked.	
setpendant	This enables the neoVI PRO pendant	
pred	Sets the intesity of the RED led on the neoVI PRO pendant	
pblue	Sets the intensity of the Blue LED on the neoVI PRO pendant	
pgreen	Sets the intensity of the Green LED on the neoVI PRO pendant	
button	Reads the button on the pendant	ui.button?

8.2 ECU 对象

目标

通过 ECU 对象访问 ECU 特殊的功能。语法如下：

```
ecu.sim.simulatetransmitmessages 0
;simulate the receive messages for those in the ECU collection
```

ECU 对象（ECU Object）

表 8-11 ECU 对象

Command Name	Description	Example
sim	Accesses the ECU simulator.	ecu.sim.compile ;compile the simulator

ecu.sim 对象（ecu.sim Object）

表 8-12 ecu.sim 对象

Command Name	Description	Example
compile	Compiles the changes made to the ECUs collection. It will regenerate the tx message collection. and copy the signals from the signal	

	collect.	
defaultsignaltype	This is an enumerated constant indicated for signals not accounted for in the signals collection or the replay data file.	
ec	Accesses the collection of Simulator ECUs for simulation.	
isrunning	Indicates if the simulator is running or not.	ecu.sim.isrunning?
manualstart	Set/Returns if the simulator starts when Vehicle Spy starts.	
replaydatafile	Set/Returns if the name of the vehicle spy log file used for replay.	
repeatreplay	Set/Returns if the replay should automatically restart when the file completes.	
start	Starts the simulator.	
stop	Stops the simulator.	
simulatenormal	Returns/Sets if the ECUs should simulate normal messaging.	
simulatediagnostics	Returns/Sets if the ECUs should simulate diagnostics messaging.	
simulatetransmitmessages	1 = tx message list is generated from the tx list of each ECU. 0 = tx message list is generated from the rx list of each ECU.	
sg	A collection of signals which will be copied to the transmit message upon compilation.	
tx	This is the collection of transmit messages sent by	

	the simulator. It is dynamically created by the compile method.	
replaystart	This starts the replay data file at the first value if the simulator is running.	
replaystop	This stops file replay if it is running.	
generatehvwakeup	If 1 the simulator will generate a single wire CAN high voltage wakeup when started.	
mg	Accesses the collection of Messages for simulation. Messages are only present if they apply some custom properties such as default message bytes or period.	
GenerateVNMF	If 1 the simulator will generate a VNMF for the single wire CAN ECUs involved in the simulation.	
VNMFID	This indicates the CAN ID of the VNMF used by the simulator.	

ecu.sim.ec 对象（ecu.sim.ec Object）

表 8-13 ecu.sim.ec 对象

Command Name	Description	Example
ecuname	The ECU short name.	
enablenetworkmanagement	If 1 the simulator uses VN (virtual network) states to determine which messages should be sent. Otherwise, they are always sent.	
key		
networkname	The network name according to the uef file "hsCAN" or "swCAN".	

ecu.sim.mg 对象（ecu.sim.mg Object）

表 8-14 ecu.sim.mg 对象

Command Name	Description	Example
databytes{X}	This allows default databytes to be entered for databytes0 through databytes7.	
description	The description of the message. This includes the ECU name followed by a backslash. "SDM\Airbag Indications"	
disablemessage	This disables this message if 1.	
overrideperiod	This will override the period of the message.	
period	The modified message period if "overrideperiod" is 1.	

8.3 从 Labview 到 Vehicle Spy 3

如下文件中包含了 Labview 子 VI 示例程序，它们利用 Vehicle Spy 的 Text API 实现与 Vehicle Spy 的交互。该界面也可实现这两个应用程序之间的数据交互。

LabviewTextAPIExampleCode.zip

下面这个文件包含了 Labview Runtimes。

LabviewTextAPI.zip