

Chapter 1	Introduction	
Updates		
Required (Components	
Kit Conten	ts	2

Chapter 2 Installation & Configuration...... 3

Uninstall Older Raven Service	Tool Software Versions (If Previously Installed)	3
Install the USB to CAN Driver		
Install the Raven Service Tool		11

Chapter 3 Routine Operation 13

Getting Started		13
Programming the Nod	е	15
Taking a CAN Trace		16
Running Test Scripts		17

Chapter 4	Troubleshooting	. 19
Routine Opera	ation	19
Frequently Asl	ked Questions	20



The instructions in this manual are designed to assist in the installation of the software needed to communicate with the nodes.

Updates

Sign up for email alerts, and you will be automatically notified when updates for your Raven products are available on the website! Software and manual updates are available on our website:

http://www.ravenhelp.com

At Raven Industries, we strive to make your experience with our products as rewarding as possible. One way to improve this experience is to provide us with feedback on this manual.

Your feedback will help shape the future of our product documentation and the overall service we provide. We appreciate the opportunity to see ourselves as our customers see us and are eager to gather ideas on how we have been helping or how we can do better.

To serve you best, please send an email with the following information to

techwriting@ravenind.com

-Raven Service Tool Installation Manual -P/N 016-5030-022 Rev. B -Any comments or feedback (include chapter or page numbers if applicable). -Let us know how long have you been using this or other Raven products.

We will not share your email or any information you provide with anyone else. Your feedback is valued and extremely important to us.

Thank you for your time.

Required Components

- Internet access
- Computer with Windows 7 or greater operating system

- Microsoft.NET software version of 4.0 or higher
- **Note:** Check the version via the computer's Control Panel. The software version will be listed next to the software name as shown in Figure 1 below. If the computer is connected to the internet, the update will be made automatically. If not, the software version will have to be updated before installing the Raven Service Tool.

FIGURE 1. Microsoft.NET Software Version

🗸 🗢 🧱 « All Control Pa	. Programs and Features	ims and Features
Control Panel Home View installed updates Turn Windows features on or off	Uninstall or change a program To uninstall a program, select it from the list and the Change, or Repair.	en click Uninstall,
Install a program from the	Organize - Uninstall/Change	= •
	Name	Publisher
	B Microsoft Office 2003 Web Components	Microsoft Corporation
	Microsoft Conferencing Add in for Microsoft Office	Microsoft Corporation
	Microsoft .NET Framework 4.5	Microsoft Corporation
	Java / Update 1/	Oracle
	Wilcrosoft Corporation Product version:	4.3.30709 http://ao.microsoft.com/f

Kit Contents

This section contains a list of the components that are included in the Raven Service Tool installation kit. Before beginning the software installation, compare the items in the kit with the components on this list. If you have questions about the kit, contact your Raven dealer.

TABLE 1. Raven Service Tool Installation	Kit (P/N 117-0171-464)
--	------------------------

Picture	Item Description	Part Number	Qty.
energy registered to the second secon	Converter - Systec USB to CAN	063-0173-428	1
TNV9 2	Drive - USB Flash with Software	063-0173-595	1
	Cable - USB to 4-pin Deutsch CAN Adapter	115-0172-029	1



Uninstall Older Raven Service Tool Software Versions (If Previously Installed)

FIGURE 1. Software to be Removed



- 1. Navigate to the computer's Control Panel.
- 2. Select Programs and Features.
- 3. Select Raven Service Tool.
- 4. Select Uninstall or Remove, depending on the computer's operating system.

Install the USB to CAN Driver

- 1. Insert the USB flash drive (P/N 063-0173-595) into an open USB port of the computer.
- 2. Locate the installed flash drive in "Computer" or "My Computer".

FIGURE 2. Zipped Installation File

Organize ▼ Share with ▼ Burn New folder		8= *	
★ Favorites	^	Name	Date mod
Desktop		🔒 Raven Service Tool Installation Bundle	6/3/2013
🗼 Downloads	=	43	
🕮 Recent Places			
🐌 1DWG (MFG)			
NPI Projects			
퉬 CARD FILE			
🕌 CII Technical File			
🧊 Libraries			
Documents			
has a	-	4	

- 3. Right-click on the zipped Raven Service Tool Installation Bundle file.
- 4. Select the destination file and then **Extract All**.
- 5. Select Next.
- 6. Select Next.

FIGURE 3. Extraction Complete



- 7. Ensure the "Show extracted files" check box is selected, then select Finish.
- 8. Open the Raven Service Tool Installation Bundle folder.



FIGURE 4. Raven Service Tool Installation Bundle Folder Contents

- 9. Open the CAN to USB driver Installation Files folder.
- 10. Open the **SO-387_Vx.xx** folder.
 - FIGURE 5. SO-387_Vx.xx Folder Contents

Name	Date modified	Туре	Size
🖭 readme	5/31/2013 11:13 AM	Rich Text Format	35 KB
🖭 revision	1/29/2013 1:58 PM	Rich Text Format	28 KB
👘 setup	1/30/2013 12:47 PM	Application	8,591 KB

11. Double-click on **setup**. The following screen will appear:



12. Select Next. The following screen will appear:



13. Select I accept the agreement, then Next. The following screen will appear:



14. Select Next. The following screen will appear:

😼 Setup - USB-CANmodul Utility Disk	
User Information Please enter your information.	
User Name: Raven User	
Organization:	
Raven Industries, Inc.	
	< Back Next Cancel

15. Enter the User Information if desired, then select Next. The following screen will appear:

15 Setup - USB-CANmodul Utility Disk
Select Destination Location Where should USB-CANmodul Utility Disk be installed?
Setup will install USB-CANmodul Utility Disk into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C:\Program Files (x86)\SYSTEC-electronic\US8:CANmodul Utility Disk Browse
At least 9.9 MB of free disk space is required.
<back nyt=""> Cancel</back>

16. Navigate to the location in which you wish to save the file or leave it as the default location, then select **Next**. The following screen will appear:

🚯 Setup - USB-CANmodul Utility Disk	X
Important Note	B
A newer firmware version may be programmed into the USB-CANmodul on plug in time. In this case the red state LED will blink with 4Hz and duty cycle 3:1. Do not disconnect the USB-CANmodul from PC while this blinking cycle otherwise it will become unusable!	
Have you read and understood this notice? R YES	
< Back Next > Cancel	

- 17. Read the notice, then select **YES**.
- 18. Select Next. The following screen will appear:

Which components should be installed?	(
Select the components you want to install; clear the components and the components and the component of the continue.	ents you do not want to
Full installation	•
Program Files	1.5 MB 🔺
V Driver Files	7.4 MB
Example files for MS Visual Studio 2003	1.1 MB
- 🔽 Demo using MFC	0.4 MB ≡
Demo using VB.NET	0.6 MB
Example files for MS Visual Studio 2008	1.7 MB
🔽 Demo using MFC	0.6 MB
Demo using VB.NET	1.1 MB
Library Files	0.6 MB *
Current selection requires at least 20.7 MB of disk space.	

19. Leave the default settings as-is and select **Next**. The following screen will appear:

	×
Select Start Menu Folder Where should Setup place the program's shortcuts?	
Setup will create the program's shortcuts in the following Star To continue, dick Next. If you would like to select a different folder, di	t Menu folder. ck Browse.
USB-CANmodul Utilities	Browse
< Back	Cancel

20. Navigate to the location in which you wish to save the shortcut or leave it as the default location, then select **Next**. The following screen will appear:



21. Deselect any options that are selected, then select Next. The following screen will appear:

🚯 Setup - USB-CANmodul Utility Disk	
Additional settings	
Settings for USB-CANmodul Control: Charable automatically check of newer driver version in USB-CANmodul Co Control Control Control Control Control	ontrol
<back next=""></back>	Cancel

22. Deselect any options that are selected, then select Next. The following screen will appear:

🖟 Setup - USB-CANmodul Utility Disk	X
Ready to Install Setup is now ready to begin installing USB-CANmodul Utility Disk on your computer.	
Click Install to continue with the installation, or click Back if you want to re- change any settings.	view or
User information: Raven User Raven Industries, Inc. Destination location:	E
C: Program Files (x86) (SYSTEC-electronic (USB-CANmodul Utility Disk Setup type: Full installation	
Selected components: Program Files Driver Files	-
(4
< Back Install	Cancel

23. Select Install. The following screen will appear:



24. Select Next. If the computer's operating system is Windows 7 or greater, the following screen will appear:



25. Select Always trust software from "SYS TEC electronic GmbH", then Install.



26. Once the installation is complete, select **Finish**.







- 27. Connect the USB to CAN converter (P/N 063-0173-428) to an open USB port on the computer using the supplied USB cable.
- 28. Install the USB to 4-pin Deutsch adapter cable (P/N 107-0172-029) on the other end of the USB to CAN converter.
- **Note:** The message "Installing device driver software" will appear in the lower-right corner of the computer screen. Two drivers will automatically be installed one on the computer and one on the USB to CAN converter.

Install the Raven Service Tool

FIGURE 7. Raven Service Tool Installation Bundle Folder Contents



29. Open the Raven Service Tool Installation Files folder. The following screen will appear:



30. Right-click (Windows 7 or greater) on setup. The following screen will appear:



31. Select Run.

P/N 016-5030-022 Rev. B



32. Select Install.

Note: If the Raven Service Tool did not successfully install, refer to Chapter 4, Troubleshooting on page 3.



Getting Started

FIGURE 1. USB to CAN Converter Installed





- 1. Connect the USB to CAN converter (P/N 063-0173-428) to an open USB port the on the computer using the supplied USB cable.
- 2. Install the USB to 4-pin Deutsch adapter cable (P/N 107-0172-029) on the other end of the USB to CAN converter.
- 3. Connect the installed adapter cable to the node or the mechanical drive, depending on the issue being investigated.

FIGURE 2. Raven Service Tool Shortcut



4. Double-click on the Raven Service Tool icon. The following screen will appear:

Raven Service T	ool v2.2.2.3	
Bus Traffic BUS Type: L	Inknown Refresh Devices	Connect
Address SN	Description	Start Logging
		Stop Logging
		Run Script
Reprogram	mming File Name Browse	Exit
		.::

Note: The Bus Traffic icon is red until the Raven Service Tool is connected to a CAN bus.

5. Select Connect. The following screen will appear:

Raven Service Too	l	
Bus Traffic	Refresh Devices	Disconnect
Address SN	Description	Start Logging
F9 1020	Service Tool	Clart Logging
13 1003	Sharnakeeo	Stop Logging
		Diagnostics
Reprogram	ming File Name Browse	Exit

Note: The device should appear in the device list and the Bus Traffic icon should be flashing green. The system is now actively functioning on the CAN bus.

Programming the Node

FIGURE 3. Raven Service Tool Main Screen

Raven Sen	vice Too	I		- D X
Bus T BUS Typ	raffic)e: J19	939	Refresh Devices	Disconnect
Address	SN	Description		Ctart La aging
F9	1020	Service Tool		Start Logging
13	1003	SmarTrax ECU		
				Stop Logging
				Diagnostics
Repro	gram	ning File Nam	Browse	Exit
				.:

1. Select **Browse** and navigate to the installed USB drive. The following screen will appear:

Name	Date modified	Туре
ISO MDU v0.0.99.hex	4/4/2013 2:55 PM	HEX File
ISO MDU v1.0.06.hex	4/2/2013 11:54 AM	HEX File
SO MDU v1.0.08.DB.hex	4/10/2013 10:12 AM	HEX File
P269V6121STD_MDB_2_19_003.hex	4/4/2013 2:55 PM	HEX File

2. Select the software file to be used to program the node, then double-click on the selection.

🖳 Raven Sen	vice Too	l	
Bus T BUS Typ	Disconnect		
Address	SN	Description	Start Logging
F9	1020	Service Tool	Start Logging
13	1003	SmarTrax ECU	
10	1791	Steering Guidance Cor	Stop Logging
			Diagnostics
Repro	gramr .0.06.he	ning File Name	Exit

- 3. Right-click on the device to be programmed in the device list, then select **Program**.
- **Note:** Programming will start automatically. The bar at the bottom of the window shows the progress of the program download. The address of the device being programmed is also visible in this location. If programming fails to start or an error message appears, re-start the programming

process from step 3 in the Getting Started section on page 13. If the programming process continues to fail, refer to Chapter 4, Troubleshooting to troubleshoot the error.

Note: Any device able to be programmed with the software selected in step 2 will be highlighted in blue. If you right-click on a device and the Program option is gray, the software is not matched to the device being programmed.

Taking a CAN Trace

There may be times when it is necessary to troubleshoot potential communication issues within the CAN system. CAN tracing is used to gather data within the CAN system.

FIGURE 4. Raven Service Tool Main Screen

🖳 Raven Ser	vice Tool v2.2.2.	3	
Bus T BUS Typ	raffic be: J1939	Refresh Devices	Disconnect
Address	SN	Description	Statt Logging
13	0000001008	SmarTrax ECU	Stall?rogging
	1020-		Stop Logging
			Run Script
Repro	ogramming F	ile Name Browse	Exit

1. Select Start Logging. The following window will appear:

🖳 Save As			×
🚱 🔾 💌 🕨 🕨 Servie Tool Stuff 🕨 Test	✓ 4 Search Test		٩
Organize 🔻 New folder			0
Favorites Desktop Downloads Recent Places IDWG (MFG) NVP Projects CARP FILE CII Technical File	Date modified No items match your search.	Туре	
🔚 Libraries 🔻 🗧	m		F.
File name: Test.bt			•
Save as type: All files (*.*)			_
Hide Folders	Save	Cance	el

- 2. Select the location in which the file should be saved.
- 3. Name the new ".txt" file or select an existing file to which to save the data, then select **Save**.
- **Note:** The Start Logging button should be "grayed out" and the Stop Logging button should no longer be "grayed out". This indicates that the Raven Service Tool is tracing CAN communication. To stop

the tracing function, select **Stop Logging**. Failure to select Stop Logging prior to closing the Raven Service Tool will result in corrupt data. The CAN trace should appear similar to the example shown in Figure 5 on page 17.

FIGURE 5. CAN Trace Example

Test - Notepad			
File Edit Format View Help			
<pre>// date Fri May 31,2013 // Filters Off // Triggers // Network Information // W/ Address - 22</pre>	04:30:50 PM		
t xtd 1 18EAFFF9 3 00 EE	00 0	0 1116911000 //	PGN Request - 0xEE00
r xtd 1 18EAFFFE 3 00 EE	00 0	0 1116911000 //	PGN Request - 0xEE00
t xtd 1 18EEFFF9 8 FC 03	E0 12 08 81 00 80 0	0 1116912000 //	SN: 0x0003FC,MN: 0x97
r xtd 1 18EEFF13 8 E2 05	E0 12 00 10 00 A0 0	0 1116912000 //	SN: 0x0005E2,MN: 0x97
t xtd 1 18EAFFF9 3 DA FE	00 0	0 1116913000 //	PGN Request - OxFEDA
t xtd 1 18EAFFF9 3 C5 FD	00 0	0 1116913000 //	PGN Request - 0xFDC5
r xtd 1 18ECFF13 8 20 32	00 08 FF DA FE 00 0	0 1116914000 //	TP.CM BAM - PGN: FEDA

4. To close the application, select **Exit**.

Running Test Scripts

Test scripts are used to test functionality of various settings in the system and gather calibration data during the logging process. Test scripts are provided by Raven Technical Support or Raven Engineering.

FIGURE 6. Raven Service Tool Main Screen

Address	SN	Description	Start Logging
F9 13	1020	Service Tool SmarTrax ECU	
			Stop Loggin
			Run Script

1. Select Run Script. The following window will appear:

🖳 Open			23
😋 🔾 🗢 🚺 🕨 Servie To	ol Stuff 🕨 👻 🐓	Search Servie Tool Stuff	٩
Organize 🔻 New fold	er	8≡ ▼ [
☆ Favorites	Name	Date modified	Туре
E Desktop	鷆 Test	5/31/2013 4:30 PM	File folder
🚺 Downloads 🚊	TxScript - SmarTraxMD-App -LA Test	4/12/2013 4:19 PM	Text Docu
🖳 Recent Places	TxScript - SmarTraxMD-App	4/4/2013 2:41 PM	Text Docu
퉬 1DWG (MFG)	TxScript - SmarTraxMD-App-OL Test	4/12/2013 6:09 PM	Text Docu
🐌 NPI Projects 🚽			
🎉 CARD FILE			
퉬 CII Technical File			
🥽 Libraries			
Documents			
📣 Music 📑	< [+
File n	ame: 🔹 🕇	Text Files (*.txt)	•
		Open	ncel

- 2. Select the desired script to be run, then select **Open**.
- **Note:** The script should begin to run automatically. While the file is transmitting, the Run Script button will turn green. Once the transmission is complete, the following message will appear:



3. To close the application, select **Exit**.



Routine Operation

Issue	Possible Cause	Corrective Action	
The Bus Traffic icon will not change to	Loose or incorrect CAN connections.	Verify CAN connections are secure and correct.	
green.	The Raven Service Tool driver is not installed.	Verify the drivers and program are installed correctly.	
The device to be programmed is not highlighted in blue.	Possible conflict with the chosen programming .hex file.	 Right-click on the device. Select Details. Verify there all parameters match to the device. Verify with Raven Technical Support that the correct .hex file is being used. 	
There are red parameters in the Details screen.	Incorrect programming .hex file was selected.	Select the correct .hex file to complete programming.	
		Select Refresh Devices.	
		Disconnect and re-connect in the Raven Service Tool software.	
	Verify the that the correct we the Raven Service Tool is be		
		If updating a Raven CAN node, connect to the Raven CAN bus.	
My device does not appear in the device list.	The Raven Service Tool is not connected to the CAN bus or is connected to the wrong CAN bus	If updating a SmarTrax MD node, connect to the MD CAN bus at the terminator by the SmarTrax MD node.	
		If updating an ISO product controller, connect to the ISO bus or ISO diagnostic port.	
		If updating a Hawkeye ECU, connect to the ECU bus.	
		If updating a Hawkeye NCV, connect to the nozzle bus.	
		Contact Raven Technical Support.	

Frequently Asked Questions

- How do I know which device needs to be programmed? Verify the name in the description field matches that of the device installed on the machine.
- How can I tell to which CAN bus the system is connected? Check the name in the BUS Type field.
- How can I tell if the CAN trace I performed was successful?
 1. Verify the .txt file size is appropriate, indicating that the document contains data.
 2. Open the file and verify it appears similar to the example below:

Test - Notepad			
File Edit Format View Help)		
<pre>// date Fri May 31,2013 // Filters Off // Triggers // Network Information</pre>	04:30:50 PM		
// My Address = ??	F 00	0 0 1116011000	
r xtd 1 18EAFFFE 3 00 E	E 00	0 0 1116911000	// PGN Request - 0xEE00
t xtd 1 18EEFFF9 8 FC 0	3 E0 12 08 81 00	0 80 0 0 1116912000	// SN: 0x0003FC,MN: 0x97
r xtd 1 18EEFF13 8 E2 0	5 E0 12 00 10 00) AO O 0 1116912000	// SN: 0x0005E2,MN: 0x97
t xtd 1 18EAFFF9 3 DA F	E 00	0 0 1116913000	// PGN Request - OXFEDA
r xtd 1 18ECFF13 8 20 3	2 00 08 FF DA FE	= 00 0 0 1116913000	// TP.CM BAM - PGN: FEDA

What should I do if the "Error parsing" message below appears?



1. Navigate to C:\Windows\Microsoft.NET\Framework\v4.0.30319\Config location in "Computer" or "My Computer," depending on the computer's operating system.

Cover 👔 C:\Windows\Microsof	ft.NE	T\Framework\v4.0.30319\Config • 49 Sea	rch Config	× = α
Organize 👻 Include in library 👻		Share with 🔻 Burn New folder)= •	1 0
Intel JohnAlyzer User Data Jogon PerfLogs Program Files Program Files (x86)	^	Name	Date modified	Туре
		legacy.web_minimaltrust.config.default	3/18/2010 5:02 AM	DEFAULT F
		🗟 machine 📐	3/7/2013 3:04 PM	XML Confi
		machine.config.comments	7/8/2012 8:30 PM	COMMEN1
		machine.config.default	7/8/2012 8:30 PM	DEFAULT F
		NetFx40_IIS_schema_update	3/18/2010 12:28 AM	XML Docur 🗸
SolidWorks Data	Ŧ	۰ III		Þ
26 items				

2. Right-click on "machine", then select "Properties".

machine Properties						
General Security Details Previous Versions						
Object name: C:\Windows\Microsoft.NET\Framework\v4.0.3031						
Group or user names:						
& SYSTEM						
Administrators (A19359\Administrators)						
Users (A19359\Users)						
at IIS_IUSRS (A19359VIIS_IUSRS)						
To change permissions, click Edit.						
Permissions for Users Allow Deny						
Full control						
Modify						
Read & execute						
Read						
Write Special permissions						
For special permissions or advanced settings, Advanced						
Learn about access control and permissions						
OK Cancel Apply						

- 3. Highlight "Users (A19359\Users)".
 4. Verify that the "Read" option is checked under the "Allow" column.
- What should I do if the "Program" option is "grayed out" when I try programming the node? 1. Right-click on the file.

Raven Sen	vice Tool v2.2.2.3		
Bus T BUS Typ	raffic be: J1939	Refresh Devices	Disconnect
Address F9 13	SN Description		Start Logging
10	N/A Details	uter	Stop Logging
			Run Script
Repro	gramming File N .0.06.hex	ame Browse	Exit
			.:

2. Select "Details".

🖳 ECU/Sft Compatibility 📡 🗖 🗖 💌					
Field	Target	Actual			
Address	XXXXXX	13			
MN	151	151			
FC	16	16			
Prod Fam	XXXXXX	0			
SN	XXXXXXX	000001008			
IG	2	2			
Fi	0	0			
VS	XXXXXX	0			
VSi	0	0			
ECUi	XXXXXXX	0			
Software P/N	XXXXXX	0770171342			
Sft Version	XXXXXXX	1.0.06			
ECU P/N	0634001010	0634001010			
ECU Rev	XXXXXX	A0			
Description	XXXXXX	SmarTrax ECU			
Status	XXXXXXX	Online			

- 3. Verify that there are no items in red in the details list.
 - If there are items in red, the programming file selected is not matched to the device. Select the correct programming file and re-start the programming process.
 - If there are no items in red, contact Raven Technical Support.

Installation & Configuration 3 Installing the Raven Service Tool 11 Installing the USB to CAN Driver 3 Uninstalling Older Raven Service Tool Software Versions 3 Introduction 1

R

Routine Operation 13 Getting Started 13 Programming the Node 15 Running Test Scripts 17 Taking a CAN Trace 16

Т

Troubleshooting 19 Frequently Asked Questions 20 Routine Operation 19