INTREPID
CONTROL SYSTEMS

neoVI-Connect

ICS

Mar 31, 2025

CONTENTS:

> **Note**
>
> **FCC ID** : 2A923241206ROEM1
>
> **IC ID** : 29961-241206ROEM1

FCC/IC STATEMENTS

FCC Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference nearby equipment, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures.

- Reorient or relocate the product.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult Intrepid Control Systems, Inc. Customer Support.

Note

"Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment."

RF Exposure

To comply with FCC/IC RF exposure requirements for mobile transmitting devices, this transmitter should only be used or installed at locations where there is at least 20 cm separation distance between the antenna and all persons. Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This Device complies with Industry Canada License-exempt RSS standard(s). Operation is subject to the following two conditions:

1. this device may not cause interference, and

2. this device must accept any interference, including interference that may cause undesired operation of the device.

RF Exposure

Conformement aux normes d'lndustrie Canada, ce transmetteur radio ne peut fonctionner qu'avec une antenne dont le type et le gain maxiumum sont approuves par lndustrie Canada. Pour reduire les risques d'inteferences radio encourus par d'autres utilisateurs, le type et le gain de l'antenne doivent etre choisis de fac;:on ace que la puissance rayonnee isotrope equivalente (PIRE) ne soit pas superieure a celle necessaire pour etablir une bonne communication. Cet appareil est conforme norme lndustrie Canada RSS exempts de licence (s). Son fonctionnement est soumis aux deux conditions suivantes:

1. cet appareil ne doit pas provoquer d'interferences, et

2. cet appareil doit accepter toute interference, y compris les interferences pouvant provoquer un fonctionnement indesirable de l'appareil.

SAFETY AND OTHER IMPORTANT NOTICES

Safety Notices

1. Prior to using this product, read, understand, and follow the instructions for this device and any associated software. If you do not fully understand the instructions, contact *Customer Support*

2. Do not use this product if it has been used outside of the specified operating conditions or is suspected to be damaged.

3. There are no operator serviceable parts inside this equipment. Should you suspect the device is not operating properly, please contact *Customer Support*

4. The failure modes of this device should be carefully considered prior to using it to instrument safety critical systems. A single point of failure at this device should not prevent the safe operation of any vehicle system.

5. Occasionally, hardware and software are released for testing and evaluation in a beta release. These releases are not subject to full Quality Assurance. They should be used only in a controlled environment with consideration of any impact the safety of the user and the surrounding people and environment. Data and test results from beta hardware and software should be appropriately scrutinized.

Intended Use

This hardware is intended for the use of developing automotive communication networks. It is suitable for operation in dry environments such as the passenger compartment or trunk area. Direct exposure to water or excessively damp environments may result in malfunction or damage to the device.

Deviating from the intended use of this product or operating outside of its specifications may cause malfunction or damage and will void the manufacturer's warranty.

Disclaimers

Every attempt is made to keep this documentation accurate and current. Intrepid Control Systems reserves the right to update this documentation without notice and assumes no liability from its use.

INTRODUCTION AND OVERVIEW

3.1 Introduction

Thank you for purchasing an Intrepid Control Systems neoVI CONNECT. The neoVI CONNECT is engineered to streamline your development process, minimize costs, and capture your vehicle network data. The neoVI Connect establishes a robust and adaptable foundation, enabling seamless integration of application and service functions for vehicle manufacturers and service providers within a single control unit. Leveraging decades of expertise in vehicle networking tools, electrical and electronic architecture, real-time solutions, IoT, and hardware, Intrepid Control Systems presents the neoVI Connect as the driving force of the automotive industry's future. The neoVI Connect will be found in many vehicles in the coming generations.

The neoVI Connect establishes a robust and adaptable foundation, enabling seamless integration of application and service functions for vehicle manufacturers and service providers within a single control unit. Leveraging decades of expertise in vehicle networking tools, electrical and electronic architecture, real-time solutions, IoT, and hardware.

3.2 Package Contents

Hardware

- The neoVI CONNECT device

Note - The OBD/Network Cable, antennas, and other hardware/software components must be purchased separately, excluding the neoVI CONNECT.

Lift up the plastic sheet, remove your neoVI device, and then fold back the cardboard upon which it rested. Underneath you will find the cables and other accessories listed above. Please remove, unwrap and inspect all of the contents, an example of which is shown in Figure 2.

If anything is missing or damaged, please contact Intrepid for prompt assistance, using the information in Chapter 9. Detailed instructions for attaching the cables to your hardware are provided later in the document.

> **Note**
>
> While the USB cable in the neoVI's package uses industry standard connectors and pinouts, not all USB cables are the same. To ensure reliable operation, please use the cable included with the neoVI's devices. If you need to replace the original, be sure not to use one longer than 6" (2 m) or you may experience problems with your hardware. If necessary, contact Intrepid for a replacement.

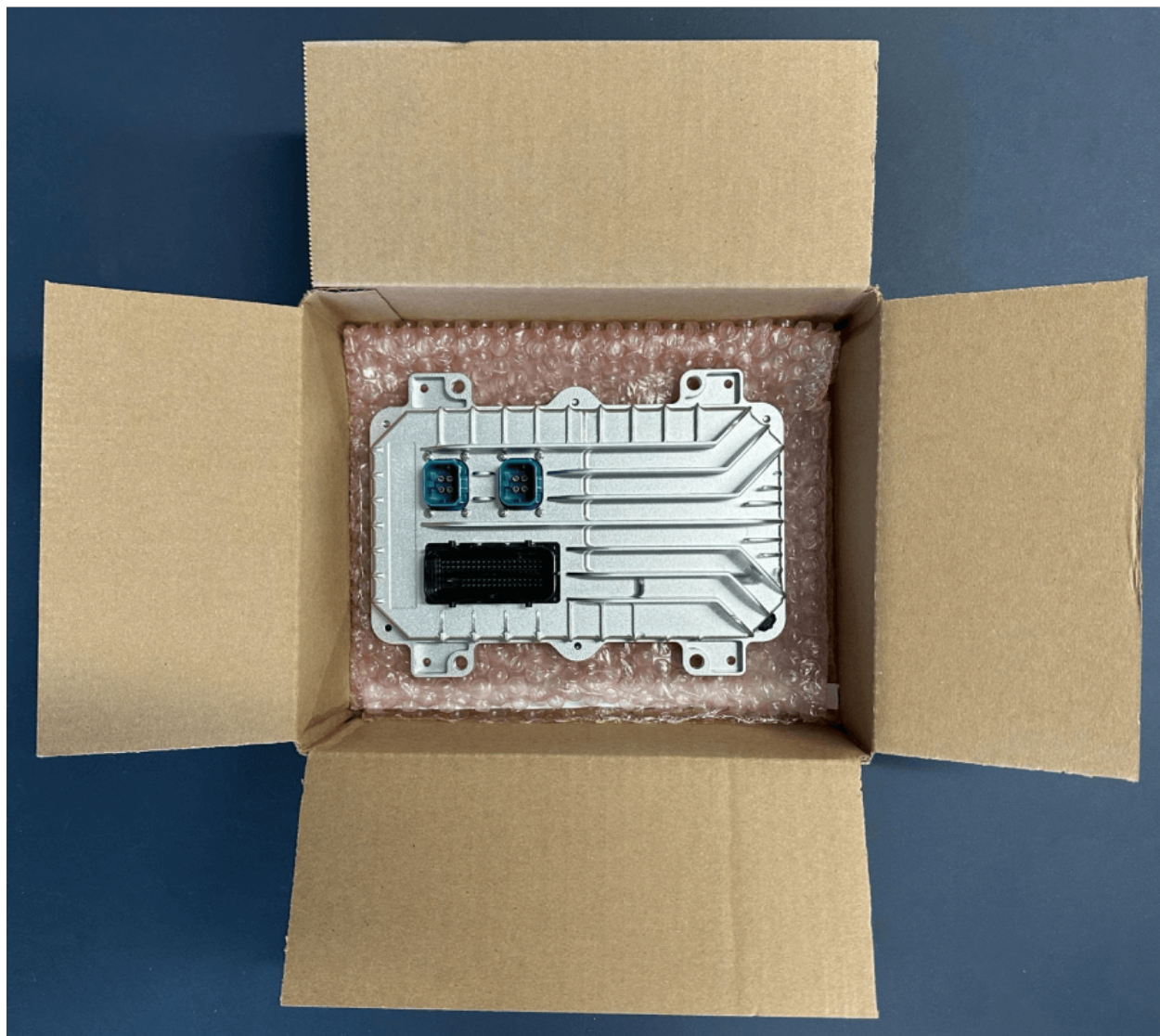**Software**

In the neoVI package you will find a software/driver card containing (otherwise you have already received this information via email):

Figure 1: neoVI CONNECT in its Protective Insert.

Figure 2: neoVI CONNECT Device Package.

- A copy of Intrepid's Vehicle Spy vehicle network software (Optional Purchase)

- Drivers for the neoVI device.

- An API install kit containing the neoVI Explorer utility for configuring the device.

Intrepid's Vehicle Spy (often abbreviated as VSpy) is the "Swiss army knife" of automotive networking tools. It allows you to easily monitor and transmit on vehicle networks, and includes capabilities for ECU simulation, data acquisition, scripting, diagnostics, data analysis and much more.

The neoVI device and Vehicle Spy are designed to work together hand in hand, and we recommend purchasing a VSpy license to go along with your new hardware. If you did so, then a full copy of the software will be emailed to you. If you did not purchase Vehicle Spy, you can request an evaluation version of the program, which allows access to VSpy's basic features. You can find the Evaluation request here: https://intrepidcs.com/products/software/vehicle-spy/vehicle-spy-evaluation/

It is also possible to control the neoVI from within other software using one of the APIs that the device supports, visit Github.com/intrepidcs to learn about our open source APIs.

3.3 Operational Overview

The neoVI CONNECT is a compact but powerful hardware tool for working with vehicle networks. Its operation can broadly be broken down into three categories: data acquisition and logging; and ECU simulation and Gateway solution in production ready form factor.

Data Acquisition and Standalone Logging

The neoVI CONNECT enables the acquisition of data from networks with precise control over collection parameters. It is designed to operate not just when connected to a PC, but also in standalone mode, running independently within a vehicle. You can write custom scripts that run in real time, which can later be downloaded to the PC for analysis.

Simulation and Scripting

The neoVI CONNECT not only allows you to receive data from vehicle networks, but also to transmit on them. Using Vehicle Spy or other software you can define transmit messages with custom data and send them manually or on a schedule of your choosing. You can also write intelligent scripts that implement arbitrary logic, and compile them into CoreMini scripts that run within the device itself. This functionality allows you to create specialized test scenarios, and to simulate ECUs and gateways.

3.4 Summary of Key Features

With the neoVI CONNECT, we've fit a lot of power and functionality into a tough little package. To give you an idea of how much you can do with the neoVI CONNECT, here's a summary of the device's most important design, construction, operational and performance features.

Construction, Controls and Cabling

- Compact design: 6.10" x 8.26" x 1.72" (15.50cm x 20.97cm x 4.375cm).

- Light weight: less than 12 oz (340 g).

- Solid anodized aluminum case.

- Thick rubber end boots for shock protection.

- Ruggedized metal connectors.

- Cable interfaces on sides for easier connections.

- Multiple cable options for vehicle networks, including Ethernet, DoIP and OBD-II.

Power and Performance

- Fifth-generation neoVI architecture, offering over ten times the performance of earlier devices.

- Memory updated to 800 MB and on-board flash to 64 MB, allowing much more space for scripting and buffering.

- 64 GB eMMC, with larger capacity available upon request

- Field-upgradeable firmware.

- Support for 12V to 24Vdc input power.

- Built-in five-second uninterruptible power supply to ensure graceful shutdown on power loss.

- Ability to configure the device and download data on the desktop using optional cable or using Wireless neoVI server

- Lower power consumption than earlier generation devices.

neoVI CONNECT Features

- Up to 8 dedicated DW CAN channels (ISO 11898-2): two LIN channels, and two Gigabit Ethernet channels (2 Gigabit Ethernet (1000BASE-T)

- All Dual Wire CAN channels have CAN FD support.

- Initial support for non-ISO CAN FD, with ISO CAN FD upgrade included when it is available.

- software-programmable CAN termination.

- 2 LIN channels.

- 4 MISC I/O channels, which can be configured as analog / PWM.

- Software-configurable CAN and LIN channels enables/disables, baud rates and other parameters.

- 1x Gigabit Ethernet (100/1000BASE-T) for use with DoIP, XCPoE and more

- Real-time clock for 64-bit message timestamping.

- 64 GB eMMC, with larger capacity available upon request.

- Remote or wireless standalone data logging capabilities

- Internal Cell Modem, WiFi, and GPS/GNSS

- Sealed connectors

- 9 DOF IMU (accelerometer, gyroscope and magnetometer)

neoVI CONNECT Logging and Simulation

- Fully-programmable scripting and standalone logging functionality.

- eMMC storage logging of all traffic.

- Software-configurable sleep mode.

- Low power modes.

- Comatose support; device wakeup can be triggered by all 8 CAN transceivers, all 2 LIN channels

Advanced Features

- Device control by external software using open APIs: libicsneo , Python_ICS , Intrepid SocketCAN Ketnel Module , neoVI DLL, SAE J2534, and TMC RP1210 A/B.

3.5 Hardware and Software Requirements

Only a small amount of hardware is required to use the neoVI:

- A vehicle network, either within an actual vehicle or in a test bench environment.

- A DC power supply capable of providing 5V to 60V of DC power, with a nominal current of 250 mA at 12V.

- A PC with an open standard Ethernet Port or USB 2.0 (or higher) if you do not have an Ethernet port on your computer. You can use an Ethernet to USB converter provided with your neoVI's. If you plan to use a USB hub, we recommend that this be a powered hub to ensure that sufficient power is provided.

Additional hardware may be required for some uses of the device:

- Interfacing to a Cellular connection requires eSIM, please reach out Intrepid to see what carrier are supported approved by Intrepid Control Systems

- Additional cables may be needed, depending on the nature of the network to which the CONNECT is being connected.

Intrepid's Vehicle Spy 3 Professional is recommended for use with the neoVI, and provides everything you need to set up your hardware and use all of its capabilities. The setup program for VSpy will also install the necessary drivers for your neoVI. If you do not have a VSpy license, you can use the Vehicle Spy evaluation version or download the free neoVI Explorer basic network interfacing and driver setup. Drivers can also be set up using the API kit installer. All of this software can be downloaded from the Intrepid web site at Intrepid Control Systems . Installation instructions can be found in Chapter 4.

Please refer to the Vehicle Spy documentation for its more specific PC hardware and operating system requirements and recommendations. Note, however, that Vehicle Spy will run on most modern Windows-based PCs.

A TOUR OF NEOVI CONNECT HARDWARE

Let's now take a short tour of the neoVI CONNECT. We'll examine the device from all sides, showing its external components and explaining what each does. This will help you become more familiar with the unit so you can more easily set up, configure and use it.

> **Warning**
>
> Warning: The neoVI's is a complex device that does not contain any user-serviceable parts. Do not attempt to open the case of the neoVI CONNECT unless specifically instructed to do so by an Intrepid Control Systems technician, or you risk possible injury or damage to the unit.

4.1 Case and Overall Design

The neoVI CONNECT device is enclosed in a ruggedized IP67 case. The device has been designed and tested for in-vehicle use, and is operational in a temperature range from -40°C to +85°C. An overall view of the neoVI's device can be seen in Figure 3.

Connectors and ports are often a point of failure with hardware devices. To ensure that the neoVI's provides you with years of reliable service, Intrepid has ruggedized the physical interfaces on the device by using a MX123 73 Position Automotive Connector and 2 AmpSeal 16 4-Position Coax Connector.

4.1.1 Cellular, WiFi and GPS Antenna Connector

The system is equipped with robust connectivity options to enhance communication capabilities. It features a **Cellular, WiFi, and GPS antenna connector**, designed to ensure seamless integration and reliable performance across various applications.

The **Ampseal connector** plays a vital role in this setup by providing a secure and stable interface for attaching both Cellular and WiFi antennas. This allows the system to maintain strong connectivity, enabling uninterrupted data transmission, whether for navigation, telemetry, or other wireless communication needs.
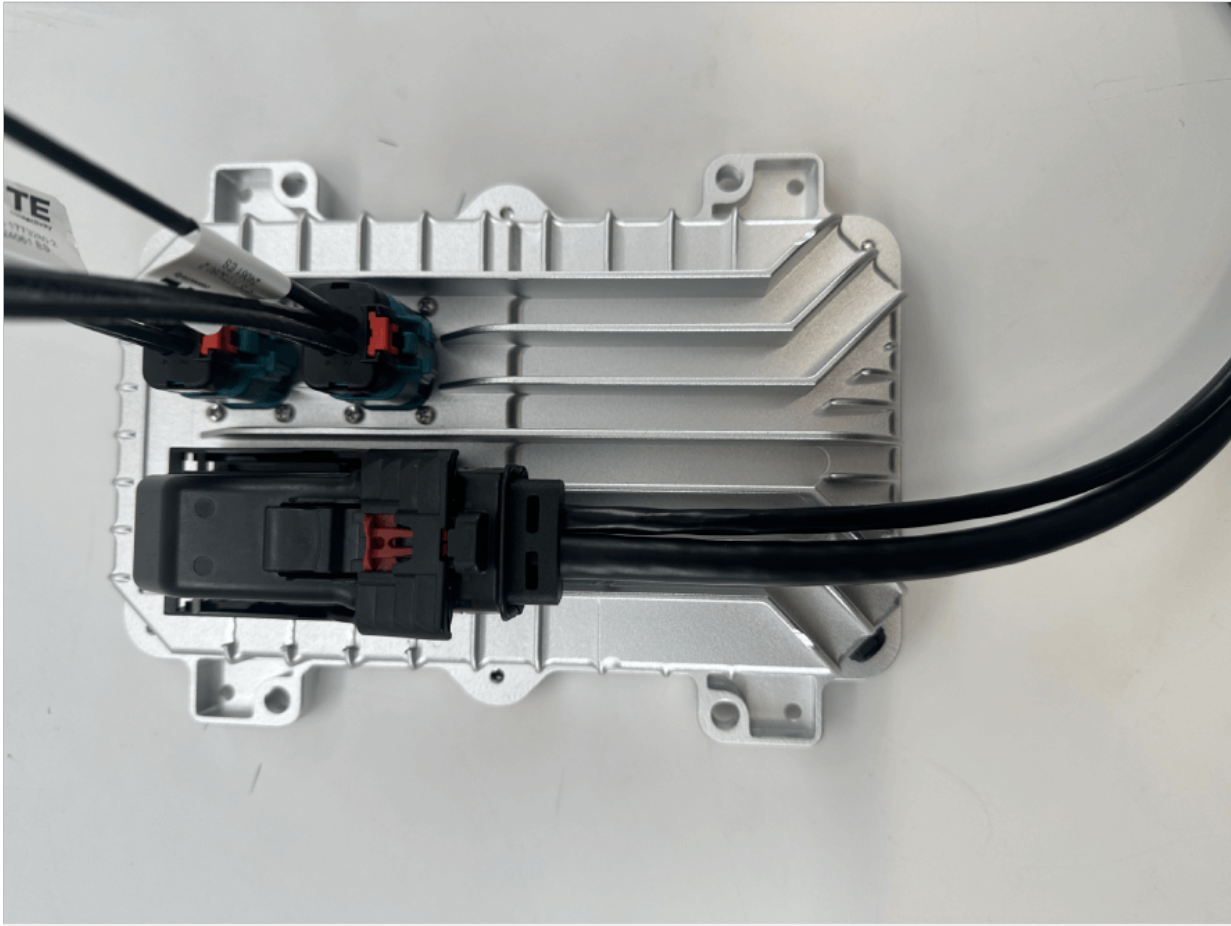
Green Connector
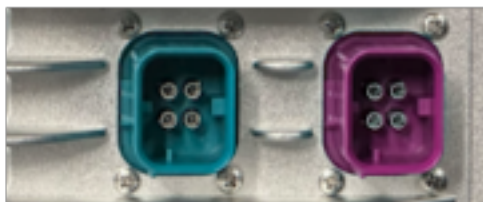
Figure 3: Overview of the neoVI CONNECT device

Figure 4: Connector

Position	Connector J8
1	WIFI
2	NA
3	GNSS
4	WIFI-1

Violet Connector

Position	Connector J8
1	CELL0
2	MIMO3
3	MIMO4
4	CELL1

FIVE

HARDWARE AND SOFTWARE SETUP

In this chapter we will explain the steps necessary to set up your neoVI device to work with a vehicle network. This will include explaining how to install the required software and drivers, connect cables between the neoVI's and the network, and link the unit to a PC.

Note that because vehicle and test bench setups will vary, we can only show a typical case here. You may need to alter these instructions to suit your particular needs.

5.1 Vehicle Spy and Driver Installation and Setup

It is possible to install your hardware and software in either order. However, the neoVI's requires special drivers to function properly, which are installed automatically by the included software setup programs. If you connect the hardware before the drivers are installed, it will not work correctly. For this reason, we recommend installing the software first.

As mentioned earlier, a fully licensed version of Vehicle Spy is recommended in order to allow you to get the most from your neoVI's. If you purchase Vehicle Spy, you should have received an email with a link to install the software; if not, a driver link should be provided that will give you access to neoVI Explorer to configure your hardware.

> **Note**
>
> A separate driver installer is provided for those who will be interfacing to the neoVI's using its API, rather than using Vehicle Spy. Please see Section 4.2 for details.

Installing Vehicle Spy (Professional or Trial)

The installation process is very similar for both the full and trial versions, though there may be some slight differences between the figures in this document and what you see on your screen. Vehicle Spy 3 uses an automated installer, which will do most of the work for you. Simply follow the instructions below to set up the program on your computer.

1. Load the Software and Documentation Disc: - Download the software with link, disc or flash drive that came with your neoVI's device into the optical drive of your computer. A few seconds later, the ICS software installation menu should appear on your computer screen, as shown in Figure 6.

From this menu you can start installing Vehicle Spy 3, install the API support files, and access videos, documentation and online support materials.

2. Start Vehicle Spy 3 Installation: Click Vehicle Spy 3 Install.

3. Select Language: Select your preferred language, and then click **OK** to proceed. (For the remainder of these directions, we will assume that English has been used.)

The Vehicle Spy 3 setup wizard will now start, displaying a welcome screen as shown in Figure 7 (though the exact version number is likely to differ from the one seen here).

Figure 6: neoVI <device name> Software Install Dialog Box.

Figure 7: Vehicle Spy 3 Setup Wizard Welcome Screen

4. Start Vehicle Spy 3 Setup Wizard: Click **Next >** to start the setup wizard.

5. Review and Accept License Agreement: Review the license agreement, and assuming its terms are acceptable, select I accept the agreement, then click **Next >** (Figure 8).

6. Select Installation Type: We are doing a new installation so simply click **Next >** to continue.

7. Select Destination Location: Choose where you want to install Vehicle Spy 3 (Figure 9). We normally recommend using the default location. Click **Next >**.

8. Select Data Directory Location: Next, choose where you want Vehicle Spy 3 to store its data files. We recommend sticking with the provided default, C:\IntrepidCS\Vehicle Spy 3 (Figure 8). Click **Next >** to continue.

9. Select Start Menu Folder: Choose where you want your Windows shortcuts for Vehicle Spy 3 to reside. Again, the defaults are generally fine here, though you can change them if you wish. Click **Next >** to proceed.

10. Select Additional Tasks: The one option here is to create a desktop icon for Vehicle Spy 3, which is selected by default. Uncheck the box if you do not wish to have this icon created, then click **Next >**.

You have now provided all of the information the wizard needs to install Vehicle Spy 3. Your selected options will be displayed in a review box, as shown in Figure 11.

11. Review Installation Options and Begin Installation: Ensure that the options you have chosen are correct, and then click **Install**.

The wizard will now begin installing Vehicle Spy 3. A window will appear showing you the progress of the installation (Figure 12)

After completing installation of the software itself, the wizard will automatically install various drivers required by Vehicle Spy 3 and the neoVI's. The first install will be guided by the VCP Driver Installer.
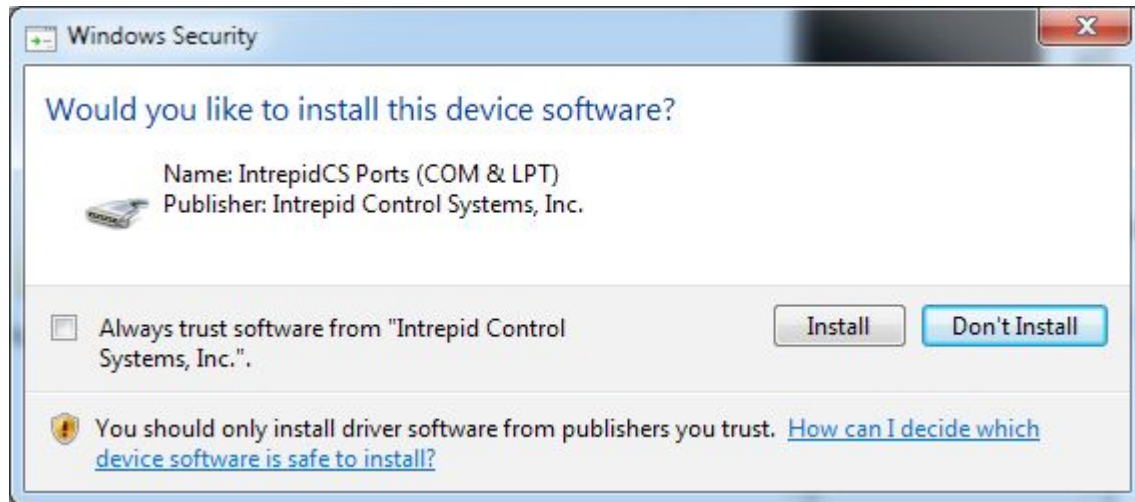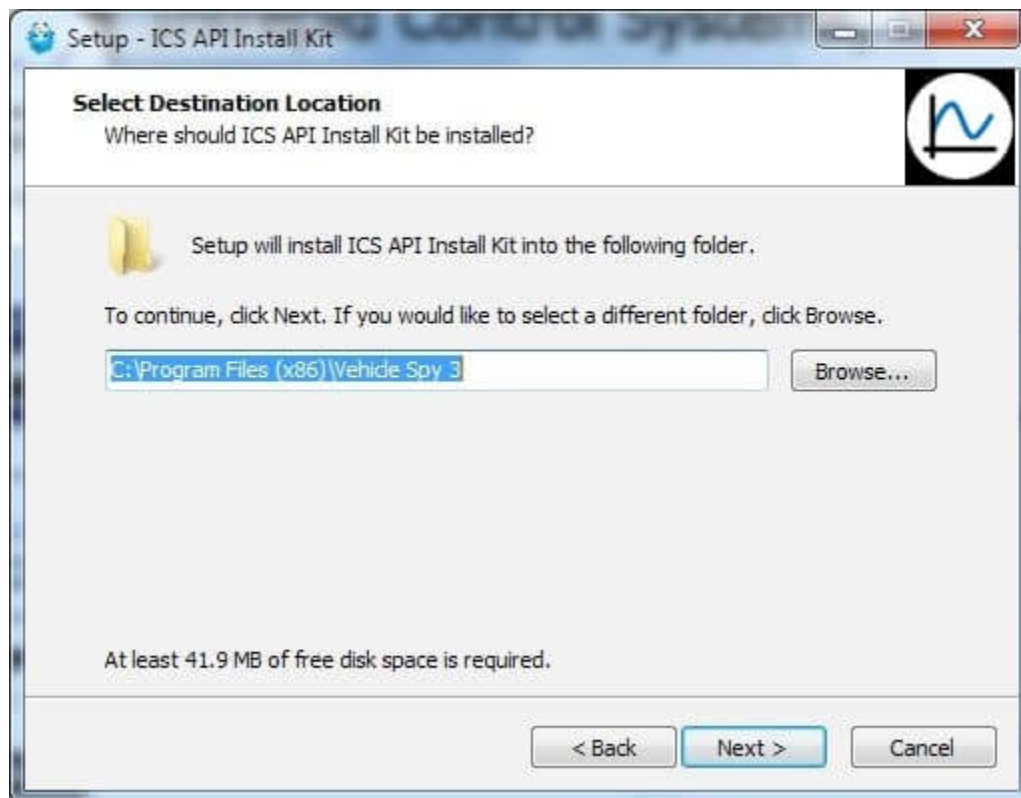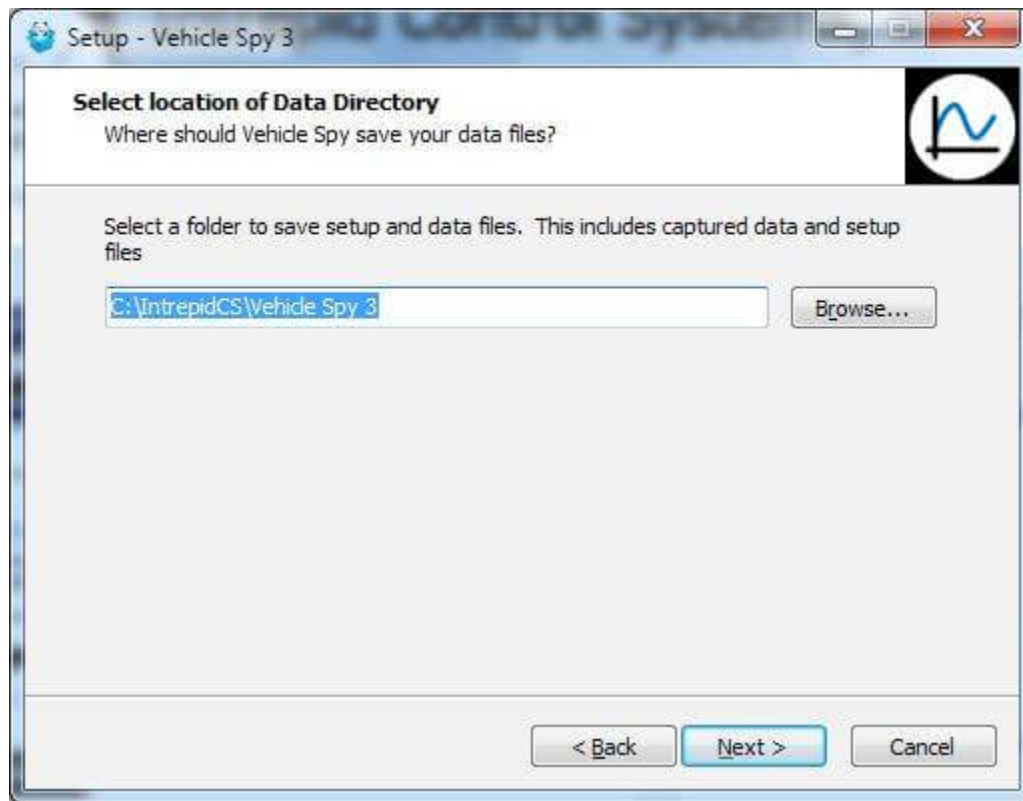
Figure 8: Vehicle Spy 3 License Agreement.

Figure 9: Choosing the Destination Location.

Figure 10: Selecting the Data Directory Location.

12. Install VCP Drivers: Click **Next >** to begin installing the first set of drivers. This will usually take only a few seconds, and when completed, a message will appear like the one in Figure 13. Click **Finish** to complete this initial driver installation process.

Next, support files for Microsoft Visual C++ 2010 and 2005 will be installed, if they are not already on the computer. This happens automatically, and you may briefly see a dialog box like the one in Figure 14. Many systems already have these files, however; if that is the case, a message may appear telling you that they are already present; just hit **OK** to continue.

The WinPcap installer will start next. This is a special support program that allows Ethernet traffic on a PC to be captured and displayed by Vehicle Spy 3. You will see a window similar to the one shown in Figure 15.

13. Install WinPcap: Click **Next >** to start the installation process. Review the WinPcap license agreement and click **I agree** if you are willing to abide by its terms. Leave the box on the next screen checked so that WinPcap starts automatically, and click **Install**. After a few seconds a message will appear saying that the installation is complete; click **Finish** to exit this installer.
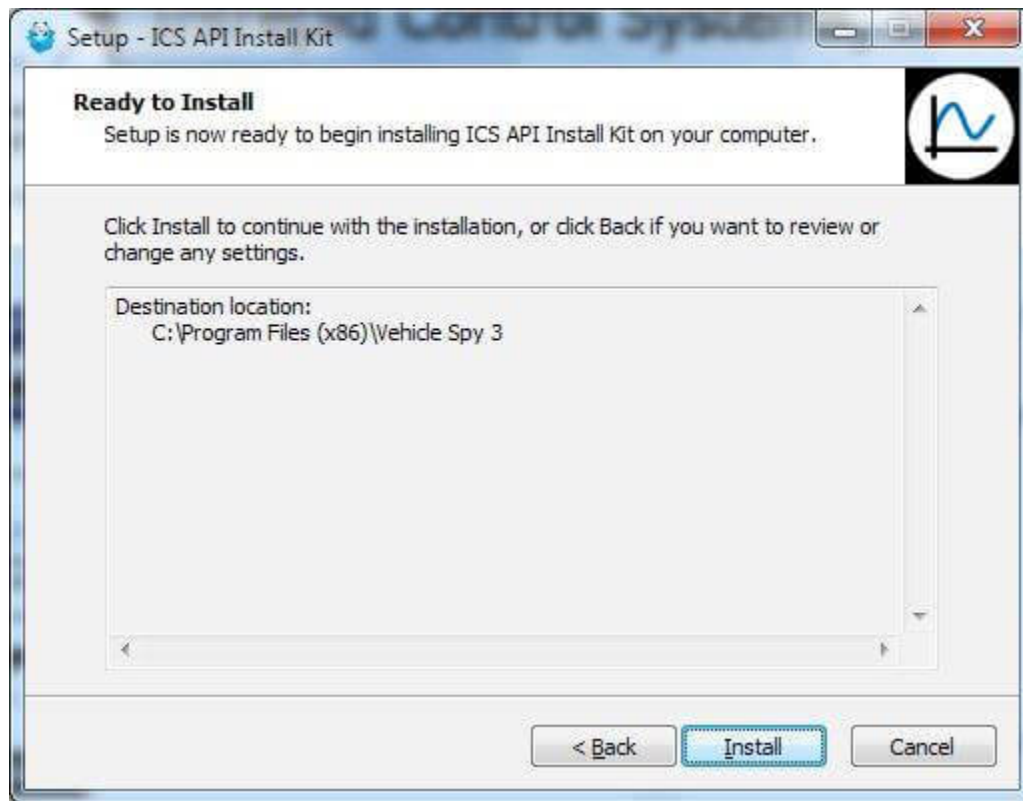
The setup wizard will now install SMSC LAN9500 device drivers. This only takes a few seconds and requires no user intervention; you may see a dialog box on the screen like the one in Figure 16.

Another ICS driver installer dialog box will now appear, similar to the first one.

14. Install ICS Port Drivers: Click **Next >** to begin installing the ICS port drivers.

At this point you may receive a prompt from Windows like the one shown in Figure 17. Please click **Install** to authorize driver installation.

Once installation begins, it will take only a few moments, and when completed, a message will appear like the one in Figure 18.

Figure 11: Installation Options Review.

15. **Complete Port Driver Installation:** Click **Finish** to exit this part of the install.

You will now see a window similar to Figure 19, indicating that the setup process is complete.

16. **Exit the Setup Wizard:** Click **Finish >**.

Congratulations, you're done!

5.2 Driver and API Support File Installation and Setup

If you plan to use the neoVI's without Vehicle Spy 3, you will need to install drivers and support files to allow the hardware to be accessed via its API. Please follow the steps below.

All of these files are installed automatically with Vehicle Spy 3, so if you followed the instructions in Section 4.1, you can skip the directions here.

1. Load the Software and Documentation Disc: Insert the disc that came with your neoVI's into the optical drive of your computer. A few seconds later, the ICS software installation menu should automatically appear on your computer screen, as shown in Figure 20.

> **Note**
>
> Note: On some computers this window may not appear automatically. If this occurs, start Windows Explorer, navigate to the disc's letter under Computer, and then double-click the file icsAutoPlay.exe to open the menu.

2. Start Support File Installation: Click RP1210 J2534 Intrepid API Install.

Figure 12: Installing Vehicle Spy 3.

3. Select Language: Select your preferred language, and then click **OK** to proceed. (We will assume that English has been used.)

The setup wizard for the ICS API and driver kit will now start, displaying a welcome screen as shown in Figure 21. (The version number you see may be different from the one shown here.)

4. Start API and Driver Setup Wizard: Click **Next >** to start the setup wizard.

5. Review and Accept License Agreement: Review the license agreement, and assuming its terms are acceptable, select I accept the agreement, then click (Figure 22).

6. Select Installation Type: We are doing a new installation so simply click **Next>** to continue.

7. Select Destination Location: Choose where you want to install Vehicle Spy 3 (Figure 23). We normally recommend keeping the default location. Click **Next >**.

You have now provided all of the information the wizard needs, and it will display a summary as shown in Figure 24.

8. Review Installation Options and Begin Installation: Ensure that the options you have chosen are correct, and then click **Install**.

The wizard will now begin installing Vehicle Spy 3. A window will appear showing you the progress of the installation (Figure 25).

After completing the basic setup, the wizard will automatically install various drivers required by the neoVI's. The first install will be done by the VCP Driver Installer.

9. Install VCP Drivers: Click **Next >** to begin installing the first set of drivers. When completed, a message will appear like the one in Figure 26. Click **Finish**.

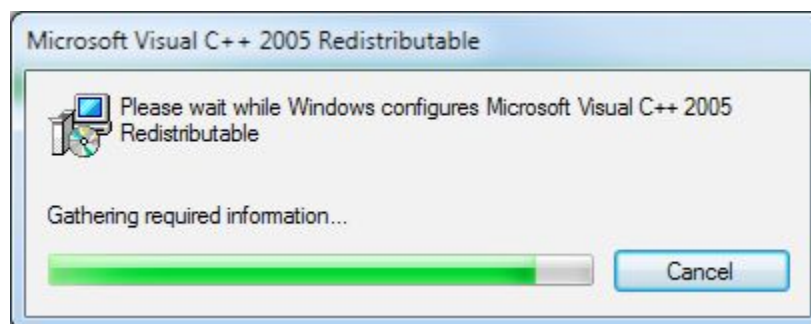Figure 13: VCP Driver Installation Complete.

Figure 14: Installing Support Files for Microsoft Visual C++ 2005.

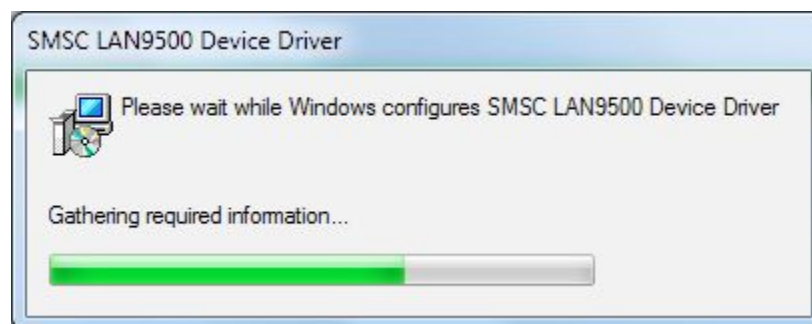**Figure 15: WinPcap setup wizard.**

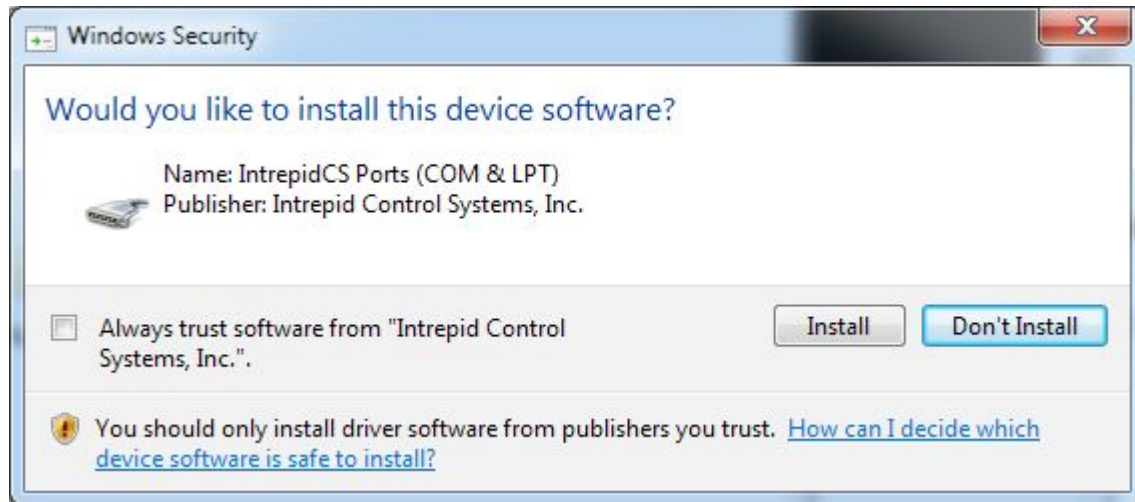**Figure 16: SMSC LAN9500 device driver installation.**

Figure 17: Windows Security Dialog Box.

Figure 18: Port Driver Installation Complete.

Figure 19: Vehicle Spy 3 Setup Complete.

Next, support files for Microsoft Visual C++ 2010 and 2005 will be automatically installed, if they are not already on the computer. You may briefly see a dialog box like the one in Figure 27. If a prompt appears saying the files are already installed, hit **OK** to continue

Another ICS driver installer dialog box will appear now.

10. Install ICS Port Drivers: Click **Next** to begin installing the ICS port drivers.

If you see a Windows dialog like the one in Figure 28, click **Install** to authorize installation.

Once installation begins, it will take only a few seconds, and when completed, a message will appear like the one in Figure 29.

11. Complete Port Driver Installation: Click **Finish** to exit this part of the install.

You will now see a dialog box like the one shown in Figure 30, indicating that the setup process is complete.

12. Exit the Setup Wizard: Click **Finish**.

Congratulations, you're done!

Figure 20: neoVI's device Software Install Dialog Box.
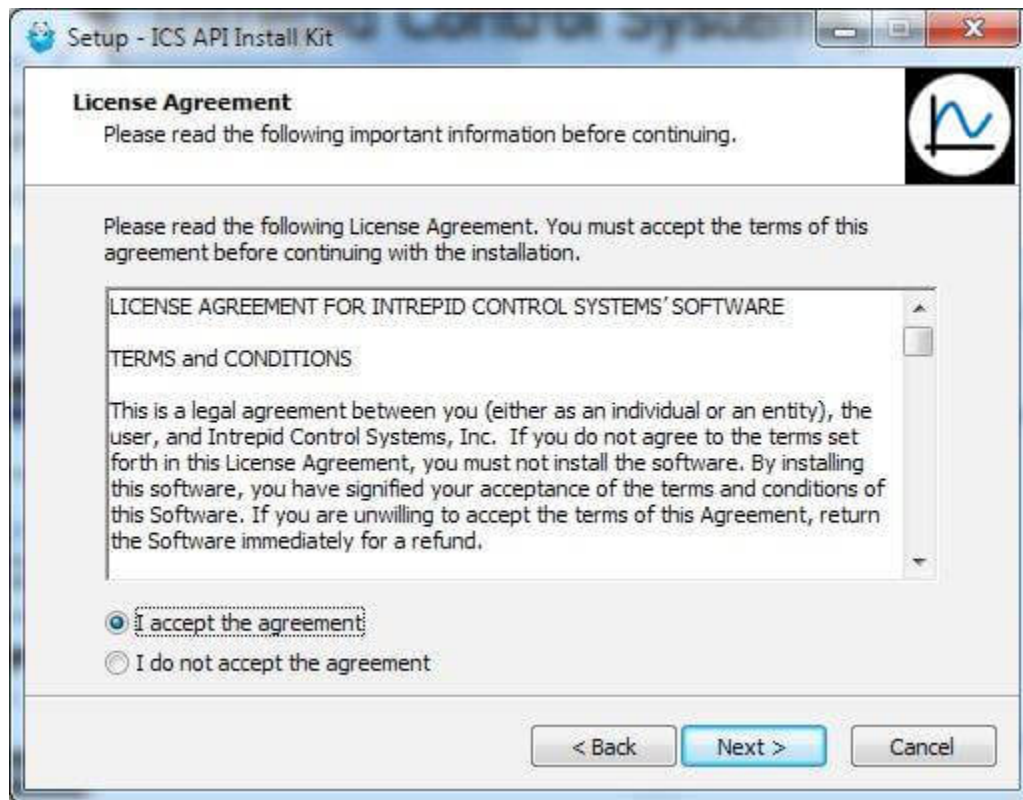
Figure 21: API and Driver Setup Wizard Welcome Screen.

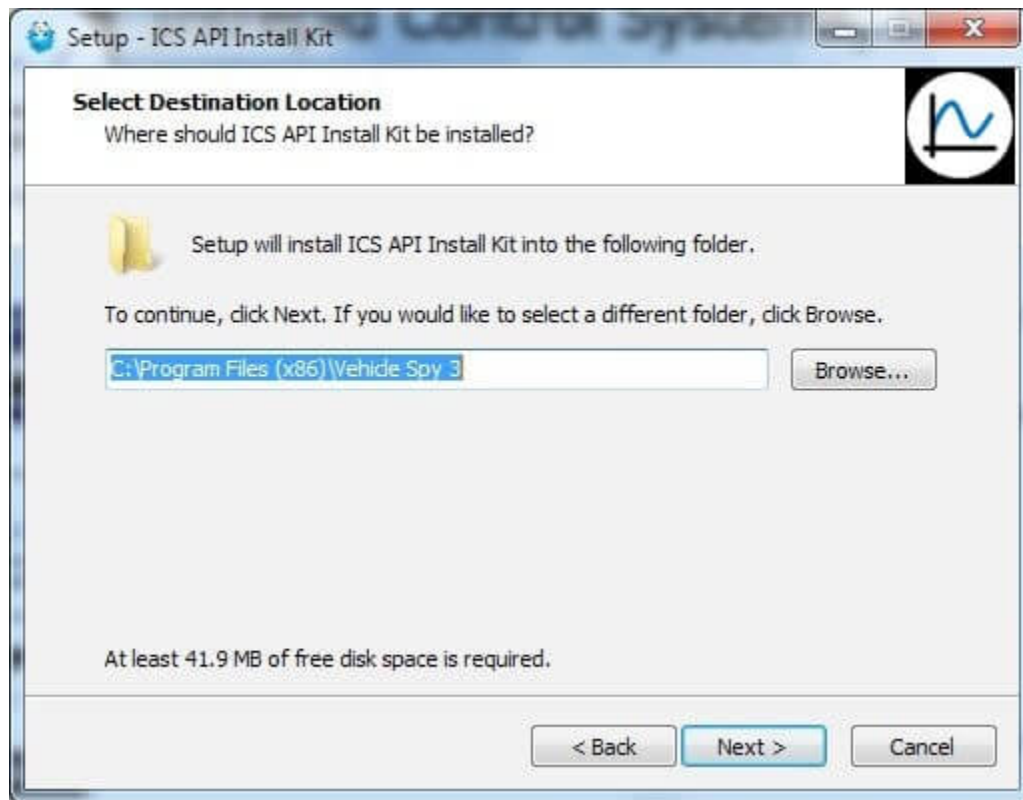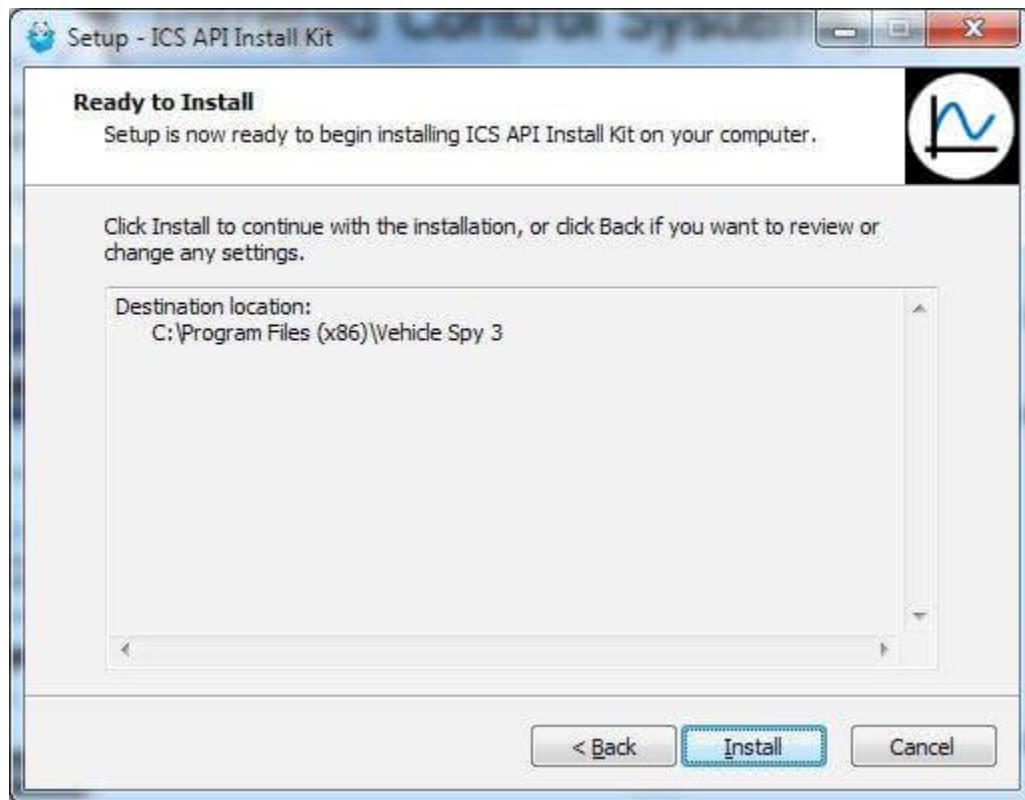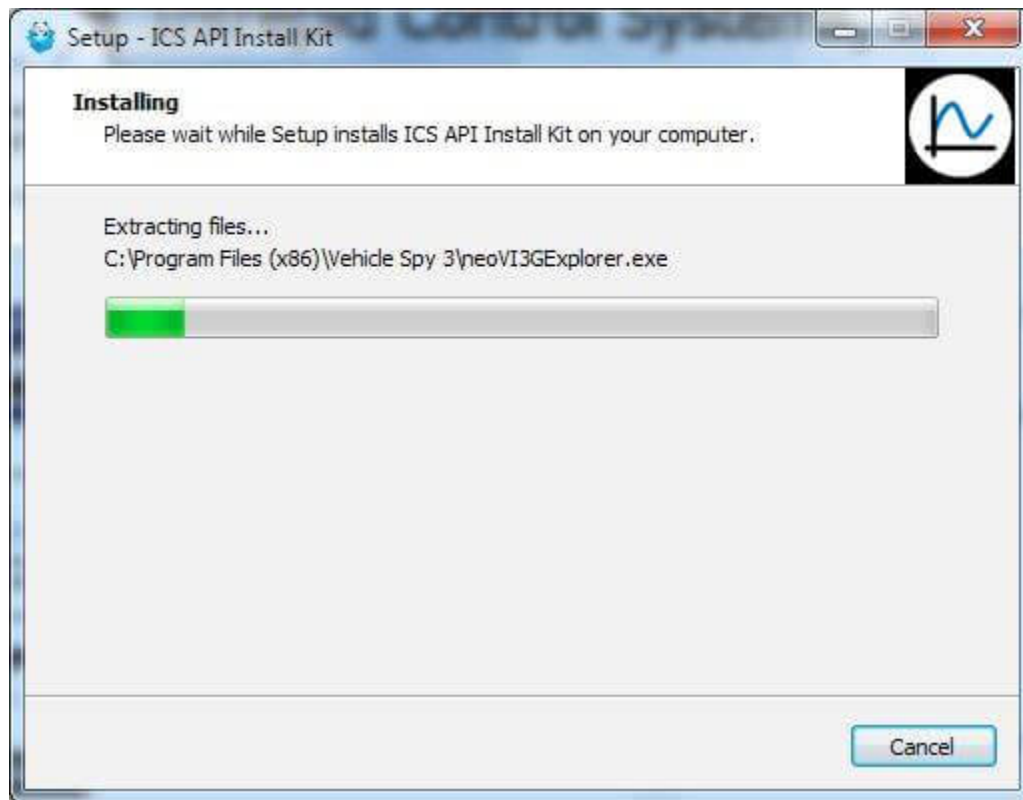**Figure 22: API and Driver File License Agreement.**

Figure 23: Choosing the API Kit Destination Location

Figure 24: API Installation Options Review

Figure 25: Installing API and Drivers.
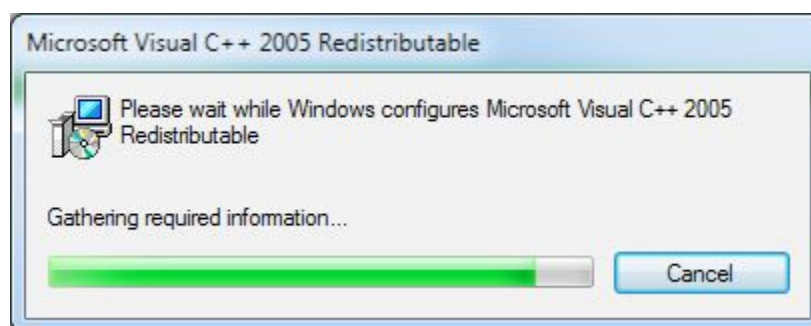
Figure 26: VCP Driver Installation Complete.

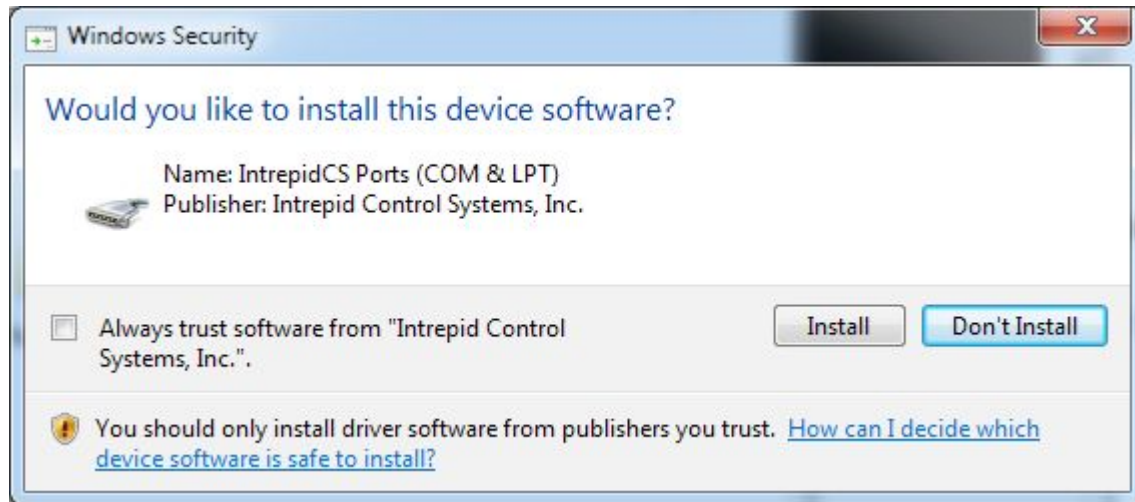**Figure 27: Installing Support Files for Microsoft Visual C++ 2005**

Figure 28: Windows Security Dialog Box

Figure 29: Port Driver Installation Complete.

Figure 30: Vehicle Spy 3 Setup Complete.

THE NEOVI EXPLORER CONFIGURATION UTILITY

6.1 Starting and Using neoVI Explorer

This section will describe general features and the basics of using neoVI Explorer. It is the utility is used to connect to, manage and configure all of Intrepid Control Systems hardware. It is an integral part of Vehicle Spy, but for those not using Vehicle Spy software, it is also available as a stand alone application in the free ICS Hardware Installation kit

6.1.1 Starting neoVI Explorer from within Vehicle Spy

There are several ways to open neoVI Explorer from within VSpy. These are probably the two easiest, since they are accessible at all times:

- **Menu Item:** Click the Setup menu and then select Hardware.

- **Hardware Setup Button:** Click the button located in the main Vehicle Spy toolbar just under its menu (Figure below).
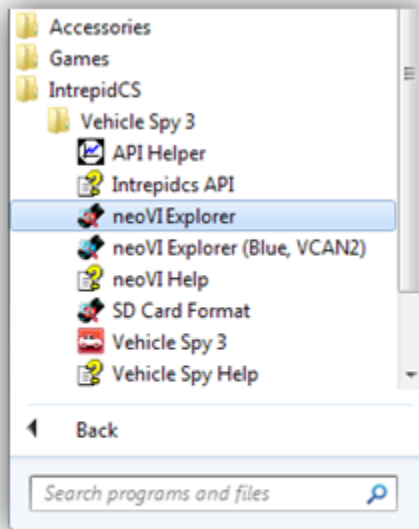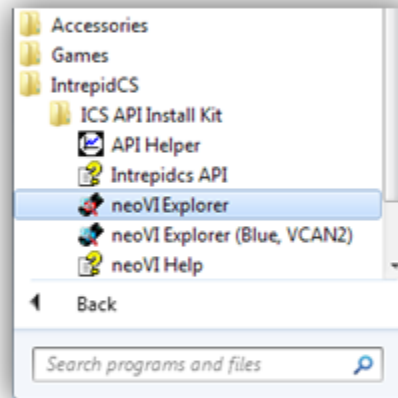

> **Note**
>
> neoVI Explorer cannot be launched when Vehicle Spy is online (even if in simulation mode). Attempting to do so, VSpy will display a prompt to either go offline and launch neoVI Explorer, or remain online and return to Vehicle Spy.

6.1.2 Starting neoVI Explorer as a Standalone Program

neoVI Explorer can be opened as as standalone program. The location of the shortcut to launch neoVI Explorer differs slightly between a Vehicle Spy installation and the ICS Hardware Installation kit as shown in the following screen captures.

Vehicle Spy Installation
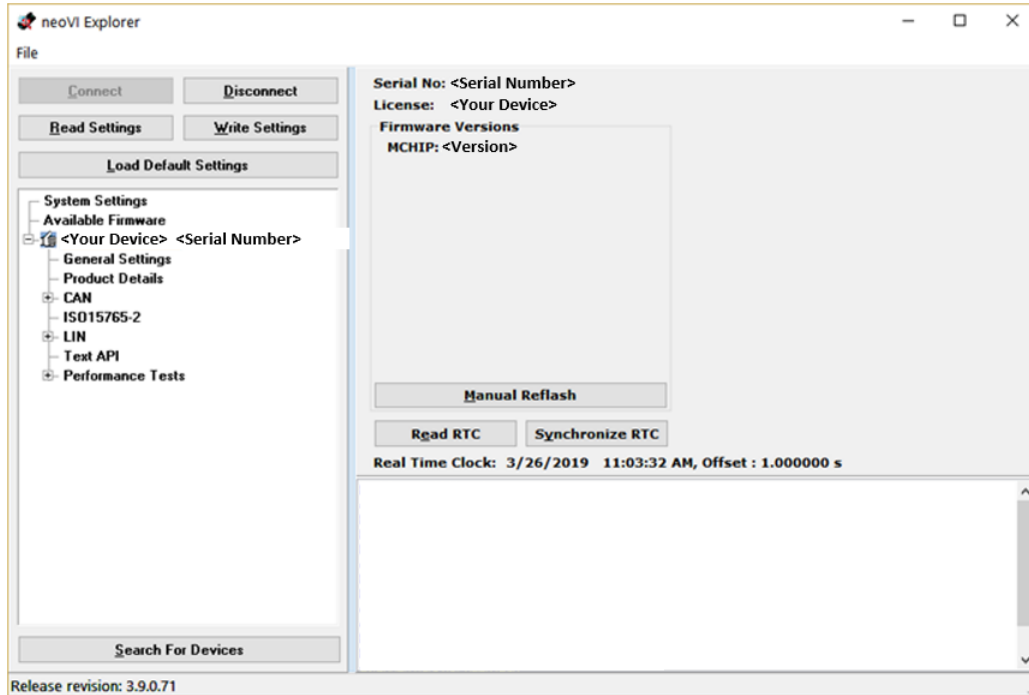
Intrepid API Installation

6.2 Interfacing with a device

6.2.1 Connecting to a device

When neoVI Explorer loads, it will start up with the first hardware device it can find selected in the menu pane on the left. Any connected devices should be listed here, along with its serial number. If a particular device is connected, but not seen among a list of other Intrepid devices, be sure to scroll down to look for it. If it is still not visible, this means its drivers have not been installed correctly, it is not powered properly, or there is a problem with the connection to the host computer.

To manage a device, click on its entry in the navigation pane (if it is not already highlighted) and then press the Connect button. After successfully connecting to the device, a "thumbs up" icon will be displayed next to the device's name, and checkmarks will appear next to currently-enabled networks in the explorer area on the left. A message in the message box on the right will also read "<Your Device and Serial Number> settings have been read". This indicates that neoVI Explorer has loaded the current settings from the unit.

The screen as a whole should appear similar to the screen shown below (but note that the device and version number shown below may be different).

Note that this screen varies in content between Intrepid devices.

Searching for Devices

After attaching new hardware to a PC and starting neoVI Explorer, press the Search For Devices button at the bottom left of the dialog box to prompt the program to scan for new hardware to be managed.

> **Note**
>
> *It is possible to click on various parameter groups at any time, but they will not show valid data until connected to the device. Remember also to connect to the device before making changes; Any changes made in neoVI Explorer with no device connected will be overwritten by a devices settings when it is connected.*

6.2.2 Device Configuration

Writing and Reloading Settings

To avoid potential problems, neoVI Explorer will not save any changes to device parameters until instructed it to do so. This is done by pressing the Write Settings button, which will update the parameters within the firmware in the device. If unwanted changes were made, pressing the Read Settings button will reload the settings stored in the device, wiping out any modifications made in neoVI Explorer that had not yet been saved.

Reloading Device Defaults

To return all settings to factory defaults, press the Load Default Settings button. Note that pressing this button actually writes the defaults to the device first, and then reloads them automatically, so it is not necessary to also press Write Settings. The message area will display that defaults have been sent to the device and then read from it.

Disconnecting from the device

Press the Disconnect button to tell neoVI Explorer disconnect the device. This step is actually optional, because neoVI Explorer will disconnect from any connected devices when the program is closed.

Exiting neoVI Explorer

Like any Windows program, neoVI Explorer can be closed by clicking the "X" in the top right corner, or pressing the Alt+F4 key combination.
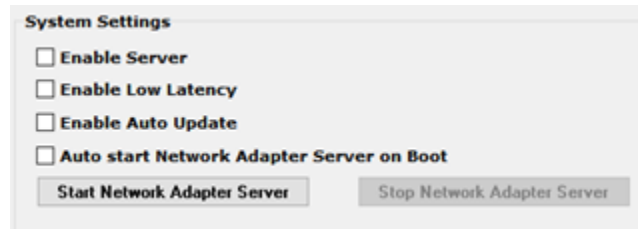
6.3 System Settings and Firmware Updates

The top two entries in the explorer window on the left side of neoVI Explorer contain system- wide settings that apply to all hardware devices, and information related to firmware updates.

6.3.1 System Settings

In the top branch of the tree in the left pane of neoVI Explorer there are several settings that can be enabled or disabled:

- **Enable Server:** Turns on the neoVI Server feature, a background program that allows the hardware to be used by multiple applications at the same time.

- **Enable Low Latency:** This is an advanced setting for applications where fast response is needed after transmission.

- **Enable Auto Update:** When enabled, both neoVI Explorer and Vehicle Spy will automatically update firmware. If this box is not checked, firmware must be updated manually. (See below for details.)

- **Network Adapter Server:** This is a feature that is used with Intrepid products having Ethernet ports. *(It may not apply to your device.)* With This feature enabled, the Ethernet ports on Intrepid hardware will enumerate as network interfaces in the operating system of the host computer. This server can be started and stopped in this window. There is also a checkbox to configure the server to start after booting of the computer.

6.3.2 Available Firmware

This is an informational page that shows which firmware versions are available in this version of neoVI Explorer for various Intrepid products. Note that some devices have multiple firmware programs that control different aspects of their operation;
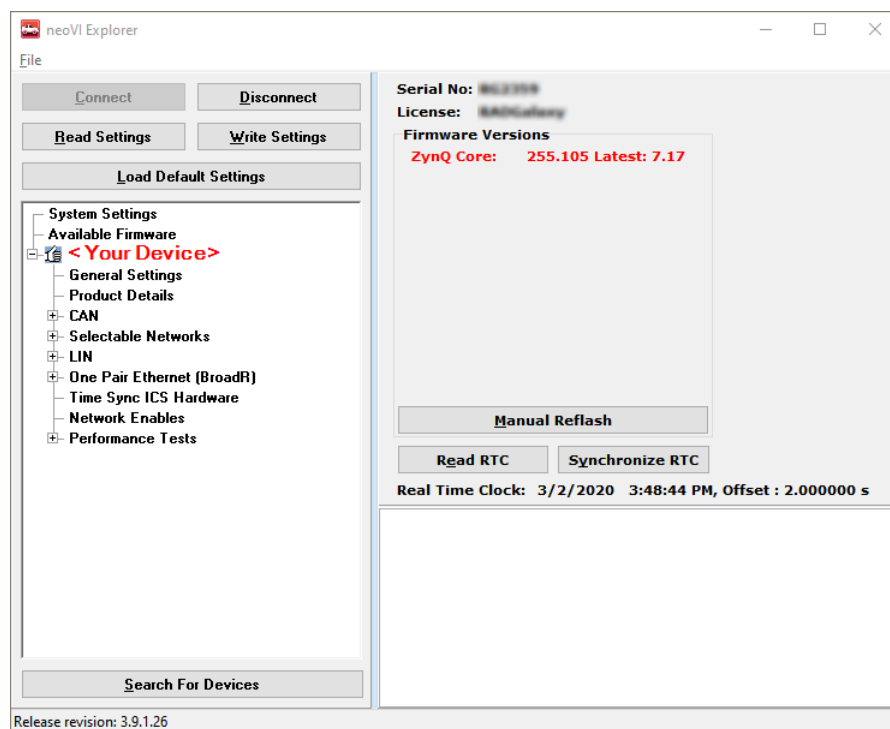
6.3.3 Automatic and Manual Firmware Updates

> **Warning**
>
> *While a device may appear to operate with incompatible firmware, proper and reliable operation cannot be guaranteed unless the version of firmware matches what is listed in Vehicle Spy*

Firmware is essentially software that runs inside hardware and is required to enable the many capabilities of a device. New versions of firmware are created regularly by Intrepid's engineers to implement new features and correct problems that have been identified.

Enable Auto Update is on by default and is recommended for most users. Each time a device connects neoVI Explorer or Vehicle Spy, the firmware will be checked, and if a newer version is available, the device will immediately be updated. If automatic updates is not enabled, it can be updated manually as needed. When new firmware is available, a red notification will be displayed on the initial connection screen, as shown below. Simply press the Manual Reflash button to update the firmware.

Note that this screen varies in content between Intrepid devices.

6.3.4 The Firmware Update Process

During the firmware update process, the device will be placed into bootloader mode, indicated by all LEDs on the top label flashing synchronously. Normal LED flash patterns will resume when the update is complete and the device reboots. The progress of the firmware update operation is displayed in a dialog box as shown below. A message box on the right side of neoVI Explorer will also be displayed as the firmware program is sent to the device. When the process is complete the dialog box will disappear and another message will appear in neoVI Explorer to confirm that the update has finished. If any error messages are displayed or any other problems experienced updating the device's firmware, please contact *Customer Support* for assistance.

> **Warning**
>
> *Please take heed of the warning on the firmware update dialog box: leave the device connected and powered on for the entire firmware update process to avoid possible problems with the device.*

6.4 General Settings and Product Details

These two areas of the device's parameter setup provide information about the device and can be used to perform a few basic maintenance tasks.

6.4.1 General Settings

After connecting to the device, basic information about it will be displayed in the right-hand pane of the window:

- The device's serial number.
- The firmware versions currently in the device, and an indication if new firmware is available.
- A message showing that the hardware license for the device was recognized.
- A current readout of the device's real-time clock.

Serial No: <Serial Number>
License: <Your Device>
Firmware Versions
MCHIP: <Version>

Manual Reflash

Read RTC   **Synchronize RTC**

Real Time Clock: 3/11/2019   3:01:17 PM, Offset : 2.000000 s

This information can be displayed again at any time by clicking the device's name in the explorer navigation window, or the General Settings entry immediately below it.

The version(s) of the firmware for the device will be shown in black if it matches the firmware version within neoVI Explorer. If not, the current version and the newest available version will be shown in red to highlight that an update is available. *(See the previous section for more about the update process.)*

There are three buttons on this screen.

1. Manual Reflash *(described in the previous section)*

2. Read RTC button will reload the device's internal time clock

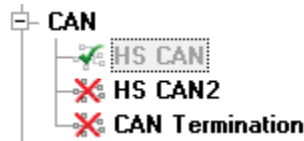3. Synchronize RTC will set the device's clock to the same value as that of the PC.

6.4.2 Product Details

This is an informational area that provides technical data on the devices's hardware and internal setup. This is generally only needed this if requested by Intrepid in order to facilitate support or troubleshooting. The Copy To Clipboard button can be used to copy all of the information to the Windows Clipboard to be pasted into an email or file.

6.5 CAN Network Settings

6.5.1 CAN Networks

This area of neoVI Explorer is used to enable, disable and configure the High Speed CAN channels. Each channel has an entry under the "CAN" group (which cannot be clicked itself). The current status of each channel is shown next to its name; a green checkmark indicates that the channel is enabled, while a red X means it is disabled. The figure below shows an example of the CAN channels area, with HS CAN enabled and HS CAN2 disabled.

All of the CAN channels have the same parameters, which can be configured using the controls in the right-hand pane; the default settings are shown below.

Enabled: Place a checkmark in this box to enable the channel, or clear the checkmark to disable it. When disabled, all of the other parameter controls are disabled (grayed out).

Specify by Baud: This is a master control that determines whether the operation of the channel is controlled by a numeric baud rate, or is calculated from lower-level timing parameters. When checked, the Baud Rate and CAN FD Baud Rate drop-down boxes are enabled and the various TQ, Sync and BRP-1 entries are disabled. When unchecked, this is reversed. Specifying by baud rate is the default, and is recommended except for advanced users with special requirements.

Baud Rate: When Specify by Baud is selected, choose a baud rate for the channel from the drop-down box below. The default value is 500000.

CAN Timing Settings: When Specify by Baud is deselected, the operation of the CAN channel is based on these five settings: TQ SEG1, TQ SEG2, TQ Prop, Sync, BRP-1. These settings are for advanced users and normally should be left at their default values.

CAN FD Baud Rate: When Specify by Baud is selected, choose a baud rate for the data phase of CAN FD messages. The default value is 2000000.

CAN FD Timing Settings: When Specify by Baud is deselected, use these settings (TQ SEG1, TQ SEG2, TQ Prop, Sync, BRP-1) for the data phase of CAN FD messages. These parameters are for advanced users and normally should be left at their default values.

Mode: The operating mode of the channel; choose from one of these four options:

- Normal: Normal operation (default).

- Disable: Channel is disabled.

- Listen Only: This channel only receives messages, with no transmissions, and also no error frames generated nor acknowledgments sent.

Bit Rate Calculator: Press this button to launch the Intrepid Bit Timing Calculator.

6.5.2 ISO15765-2:

This page contains one setting: IFS Shift Register (shown below). Changing this from its default value of 0 causes time to be added to the Inner Frame Spacing of USDT frames transmitted by CoreMini scripts running in the FIRE 2. The number entered is multiplied by 6.4 μs to determine the time offset. The allowed range is -1563 to 1563.

IFS Shift Register

| 0 | X 6.4us = 0 us |

This value is added to the received Inner Frame Spacing for USDT frames transmitted from CoreMini. Each increment represents 6.4us. Range: -1563 to 1563.

6.6 LIN Network Settings

This section the device's explorer tree allows enabling, disabling and configuring its LIN channels. Each channel has an entry under the "LIN" group (seen below). As with the CAN channels, a green checkmark indicates that a particular channel is enabled, while a red X means it is disabled.

All of these channels have the same parameters, which can be seen below. In this image we have selected the Advanced Options checkbox to display its options (described below).

Enabled: Place a checkmark in this box to enable the channel, or clear the checkmark to disable it. When disabled, all of the other parameter controls are disabled (grayed out).

Baud Rate: Select a baud rate for the channel; the default is 10417.

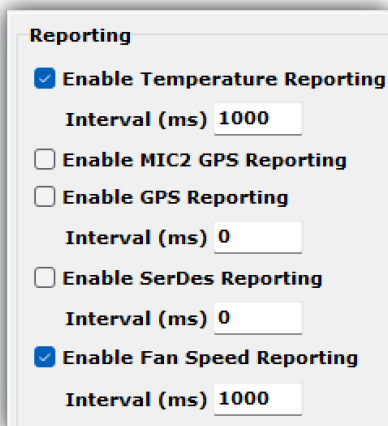**Mode:** This option is currently not used and should be left at the default of "Normal Mode".

Master Resistor On: Enable this option for the device to act as the master on the specified LIN bus.

Advanced Options: Click this checkbox to reveal two additional options:

- Master Slave Interval: The time between the master ID and the first slave byte, in bits (default 0).

- Verbose Error Reporting: When checked, break errors and other error messages from the LIN driver are displayed.

6.7 Reporting

This enables reporting of status information to Vehicle Spy or the ICS APIs.

6.8 Text API

These parameters control the operation of the text API that can be used to operate the neoVI FIRE 2 using third party software. Please contact *Intrepid Customer Support* if any assistance using the API is required.

6.9 Network Enables

All device networks can be enabled or disabled in this branch of the configuration tree. The enabling/disabling that can be done here is redundant with what can be done in the network specific branches in neoVI Explorer.

This part of the configuration interface is used across all of Intrepid's products, therefore you may see a superset of every network offered on our devices. Clicking "Hide Unsupported Networks" will display only those networks on the device connected.

6.10 Performance Tests

The following are tests which can be used to characterize the bandwidth and latency between ICS hardware and its host computer. If problem is encountered with either of these, our *Customer Support* would be happy to help resolve it. Reference the end of this document for contact information.

6.11 ISO 15765-2

This page contains one setting: IFS Shift Register (Figure 68). Changing this from its default value of 0 causes time to be added to the Inner Frame Spacing of USDT frames transmitted by CoreMini scripts running in the neoVI's device. The number entered is multiplied by 6.4 μs to determine the time offset. The allowed range is -1563 to 1563.

CORE FEATURES

The goal of this section is specifically to assist those who are new to Intrepid hardware and software. Advanced users may wish to skim or even skip this section entirely.

7.1 Interfacing with Vehicle Networks using Vehicle Spy

Following are simplified examples of how to use Intrepid's Vehicle Spy, the ideal tool for working with your device. Due to the complexity of Vehicle Spy, we only describe the basics necessary for the examples; for full details on this powerful software tool, please see the separate Vehicle Spy documentation.

> **Note**
>
> Intrepid makes a wide variety of hardware, each having their own mix of different networks integrated. Your device may not have all of the networks and capabilities in the following section. If you are unsure of your device's features, reference *Introduction and Overview* or contact *Customer Support*.

7.1.1 Monitoring CAN/CAN-FD and Ethernet

Once the device is configured correctly, this example will show how your device can monitor CAN traffic on a bench network using Vehicle Spy 3.

Assuming that your network already has CAN messages being transmitted by other devices, we can monitor that traffic with these simple steps:

1. **Launch Vehicle Spy:** Start Vehicle Spy by double-clicking its icon or selecting it from the Windows Start Menu.

2. **Select your device: On the *Logon Screen*, select your device**
   if it does not already have a green checkmark next to it. To do so, right-click the device name and choose *Select Hardware*.

3. **Go Online:** Press the blue button in the top left corner of Vehicle Spy.

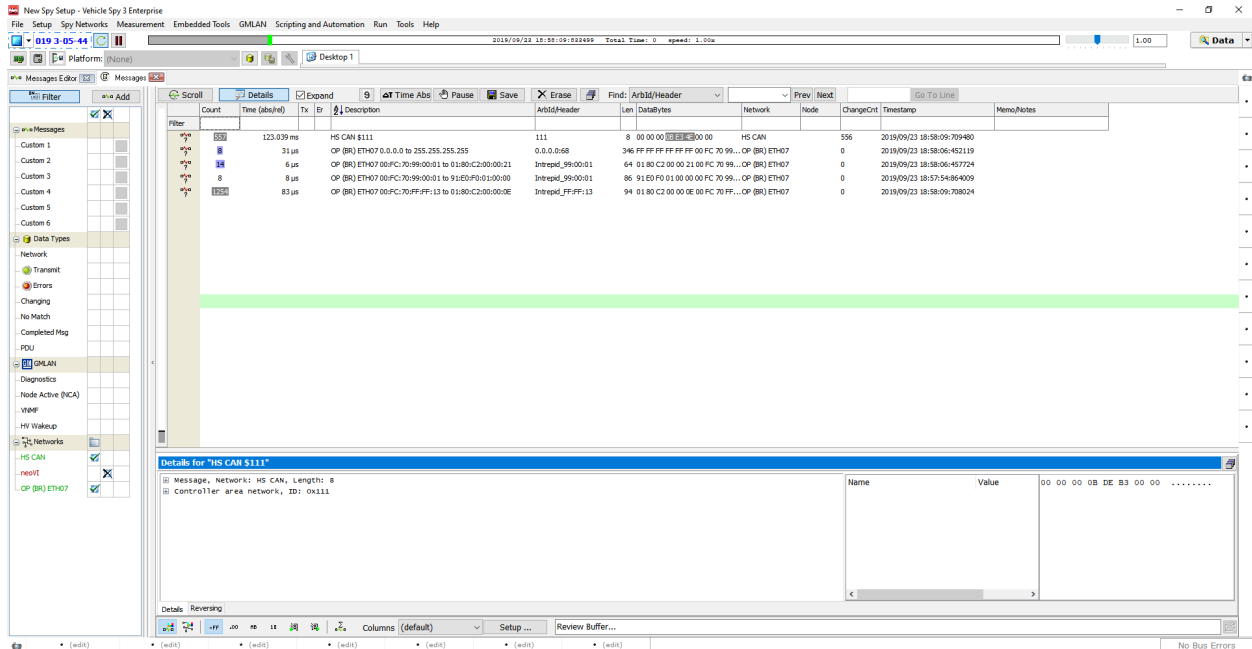The program will go online and automatically switch to *Messages View*, showing you the incoming traffic. The example below shows CAN messages that are being transmitted to your device. By default, CAN messages sharing the same Arbitration ID will be shown with the latest update of data bytes available (Static View). Similarly, Ethernet messages are grouped based on Source Address and Ethertype. If you prefer to see the messages in chronological order, press the Scroll button located just above the message display.

Notice that the messages are shown in their raw form, with some header information and data bytes. If you have a database matching the message traffic being monitored, you can load it into a platform and Vehicle Spy will decode the messages and show the signals within each. For details on how to accomplish this, please consult the Vehicle Spy documentation.
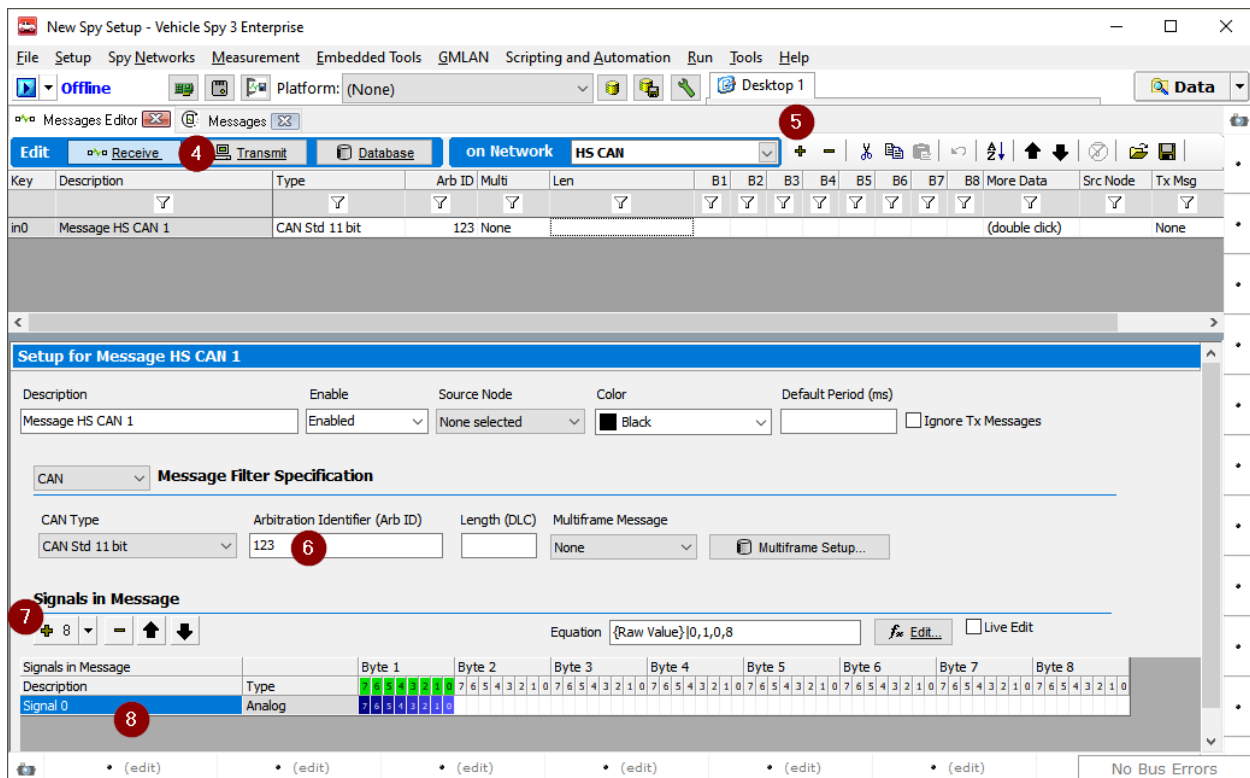
7.1.2 Transmitting on CAN/CAN-FD and Ethernet

In addition to monitoring network traffic with your device, we can also easily generate and transmit traffic of our own. We'll show how this is done by creating and then transmitting am custom CAN message on the HS CAN channel.

Creating a CAN Transmit Message

Make sure your device is connected to your vehicle network. Then follow these steps to create and transmit a message:

1. **Launch Vehicle Spy:** Start Vehicle Spy by double-clicking its icon or selecting it from the Windows Start Menu.

2. **Select your device:** On the Logon Screen, selec your device if it is not already selected: right-click the device name and choose Select Hardware.

3. **Load Messages Editor:** Select Messages Editor from the Spy Networks menu.

4. **Select Transmit Messages:** Click the Transmit button, found in the blue bar.

5. **Create Transmit Message:** To the right of the drop-down box that currently shows "HS CAN", click the button. Vehicle Spy will generate a new HS CAN transmit message called "Tx Message HS CAN 1", preset with default values.

6. **Set Message to Arbitration ID 123:** Under the Arb ID column for the message, enter the value "123".

7. **Add Message Signal:** In the middle of the screen, find "Signals in Message; just below this click the button. A signal called Signal is created.

8. **Rename Message Signal:** Under the Description column, double-click Signal and change the name to Engine Speed.

Creating an Ethernet Transmit Message

1. **Select Transmit Messages:** Click the Transmit button, found in the blue bar.

2. **Change to Ethernet transmit table:** Select "Ethernet" from the "on Network" drop-down menu

3. **Change Ethertype:** Select "ARP" from the Ethertype drop-down menu

4. **Change the Detination Address:** Use a broadcast address. (FF:FF:FF:FF:FF:FF)

Transmitting on CAN and Ethernet

We'll now use the Tx Panel to specify a simple static value to send in that signal, and then instruct Vehicle Spy to transmit the message periodically.

1. **Load Tx Panel:** Select Tx Panel from the Spy Networks menu.

2. **Select Message:** Click on "HS CAN Message" under Description on the left side of the screen.

3. **Set Signal Data Value:** On the right side of the screen, double-click under Value for the Engine Speed signal, and enter "207". (You may need to first move the vertical divider bar that separates the two halves of the Tx Panel, by clicking on it and dragging it to the left.)

4. **Select Transmission Rates:** The message by default is set to "Periodic" transmissions, but the rate says "None". Double-click in this field, scroll down and choose "0.100" for both the CAN and Ethernet messages.

Monitoring

Let's now switch to Messages View and go online to see our message being transmitted on the CAN and Ethernet networks.

1. **Switch to Messages View:** Select Messages from the Spy Networks menu.

2. **Go Online:** Press the blue arrow button in the top left corner of Vehicle Spy. You should now see a new "Message HS CAN 1" message show up about every 100 ms Notice the green dot under the Tx column, which labels this as a transmitted message.

3. **Expand Message:** Press the + sign to the left of "Message HS CAN 1". Vehicle Spy shows you the Engine Speed signal with the value we set in both decimal (207) and hexadecimal (0xCF).

Naturally, in a real example we would want to create a more realistic depiction of engine speed. This can be done in a variety of ways in Vehicle Spy, such as writing a function block program to describe behavior and control message transmission. Please refer to the Vehicle Spy documentation, the Intrepid website, or Intrepid's tech support for examples of transmits and simulation of frames.

7.2 CoreMini

CoreMini is an embedded environment within Intrepid hardware that allows many functions found in Vehicle Spy to be executed in hardware for real-time performance and/or standalone execution. Function Blocks, periodic messages, automatic message replies, and standalone gateways. are all features in Vehicle Spy that can be executed in the embedded CoreMini environment.

7.2.1 High Performance Script Execution

Function Block Scripts, can be thought of as simple state machines that have access to all of the network resources of your device. Inputs to the script can be network traffic, network status, and state variables. The script executes logical statements on its inputs, can perform arithmetic operations on state variables, and send messages on a network based on outcome of these logical statements and state variables.

Function block scripts can be executed by Vehicle Spy while connected to a PC, but since Windows is not a real-time operating system, the performance of some functions in Vehicle Spy can have unacceptable latency and determinism. In this case, it is advantageous to have the script run in the embedded CoreMini environment for the time-critical functions with Vehicle Spy executing the non-time-critical functions. To load the scripts into the hardware for embedded execution, use the CoreMini Console. The script will immediately start to execute and continue to execute when online with Vehicle Spy.

Note that in many cases, it is not desirable to have scripts running embedded and in Vehicle Spy. To prevent this, ensure that the Function Block Start Tab is set to "Start Immediately Embedded Only".

7.2.2 Stand-alone Operation

Stand-alone execution of scripts and gateways is a powerful feature in most Intrepid products. Once a script is loaded in CoreMini, it will run stand-alone at power up, provided neither of the following conditions prevent its execution.

- The script is configured to wait for a Start Condition before execution.

- Scripts are disabled when the device detects a USB host computer at power up. This functionality is a failsafe, should a errant CoreMini script make the device unresponsive. For a script to run, first connect power, then connect USB.

> **Bypassing script failsafe with USB host connected**
>
> This can be disabled on some devices having a second failsafe to prevent script execution by holding one of the membrane buttons down while applying power. See *The neoVI Explorer Configuration Utility* for more information.

EIGHT

ADVANCED FEATURES

In this chapter we provide additional information on some of the neoVI's new and advanced features.

Note that some of these features are not yet currently implemented in the neoVI's, but their capabilities will be provided in future firmware upgrades, at which time this manual will be updated to explain their use.

8.1 neoVI API

The neoVI's device comes with support for a full API that allows you to control the device from other software packages or custom-written software. For instructions on using the API, please consult its documentation on the Intrepid website at: neoVI API.

8.2 USB Host

The neoVI's device comes with a USB host port that allows other devices to be plugged into it (see Figure 6 in Section 3.3). Due to the difficulties associated with driver development, this port is intended for specific devices rather than general purpose use. It is especially designed to work with devices such as the Intrepid neoVI MIC microphone/trigger pendant, or the RAD-Moon (as seen in Section 6.3)

REFERENCE: CONNECTOR PINOUTS AND CABLE SIGNAL MAPPINGS

This section contains complete pinouts for the connectors on the neoVI's, as well as those on the network interface cables used to attach to it. For your convenience, tables are also provided that show the mappings of signals between pin numbers on the connectors of each network cable.

Note that the USB cable is industry standard and not covered here.

9.1 neoVI's Devices Connector Pinouts

We'll start with the pinouts for the connectors on the neoVI's devices itself.

9.1.1 neoVI Connect 73 Pin Connector & Antenna Connector Pinout

HD26-1

Pin #	Name	Description
1	RFU	Reserved for future use
2	RFU	Reserved for future use
3	RFU	Reserved for future use
4	RFU	Reserved for future use
5	RFU	Reserved for future use
6	RFU	Reserved for future use
7	RFU	Reserved for future use
8	RFU	Reserved for future use
9	RFU	Reserved for future use
10	RFU	Reserved for future use
11	RFU	Reserved for future use
12	RFU	Reserved for future use
13	RFU	Reserved for future use
14	RFU	Reserved for future use
15	RFU	Reserved for future use
16	VBAT_IN	VBAT
17	RFU	Reserved for future use
18	RFU	Reserved for future use
19	RFU	Reserved for future use
20	RFU	Reserved for future use
21	RFU	Reserved for future use
22	RFU	Reserved for future use
23	RFU	Reserved for future use

Table 1 – continued from previous page

Pin #	Name	Description
24	RFU	Reserved for future use
25	RFU	Reserved for future use
26	RFU	Reserved for future use
27	RFU	Reserved for future use
28	RFU	Reserved for future use
29	RFU	Reserved for future use
30	GND	Ground
31	RFU	Reserved for future use
32	PON	Power On
33	ENET_PULL	Ethernet Pull Up Resistor
34	ETH GND	Ethernet Ground
35	MDIO DC P	100M/1G Ethernet
36	MDIO DC N	100M/1G Ethernet
37	ETH GND	Ethernet Ground
38	MDIO DD P	100M/1G Ethernet
39	MDIO DD N	100M/1G Ethernet
40	ETH GND	Ethernet Ground
41	VEM DW CAN 1 H	VEM Dual Wire CAN 1 High
42	VEM DW CAN 1 H	VEM Dual Wire CAN 1 High
43	VEM DW CAN 2 L	VEM Dual Wire CAN 2 Low
44	VEM DW CAN 2 H	VEM Dual Wire CAN 2 High
45	VEM DW CAN 3 L	VEM Dual Wire CAN 3 Low
46	VEM DW CAN 3 H	VEM Dual Wire CAN 3 High
47	VEM DW CAN 4 L	VEM Dual Wire CAN 4 Low
48	VEM DW CAN 4 H	VEM Dual Wire CAN 4 High
49	VEM DW CAN 5 L	VEM Dual Wire CAN 5 Low
50	VEM DW CAN 5 H	VEM Dual Wire CAN 5 High
51	VEM DW CAN 6 L	VEM Dual Wire CAN 6 Low
52	VEM DW CAN 6 H	VEM Dual Wire CAN 6 High
53	ETH GND	Ethernet Ground
54	MDIO DA P	
55	MDIO DA N	
56	ETH GND	Ethernet Ground
57	MDIO DB P	
58	MDIO DB N	
59	ETH GND	Ethernet Ground
60	VEM DW CAN 7 H	VEM Dual Wire CAN 7 High
61	VEM DW CAN 7 L	VEM Dual Wire CAN 7 Low
62	VEM DW CAN 8 H	VEM Dual Wire CAN 8 High
63	VEM DW CAN 8 L	VEM Dual Wire CAN 8 Low
64	LIN 1	LIN 1
65	LIN 2	LIN 2
66	RFU	Reserved for future use
67	RFU	Reserved for future use
68	MISC IO 1	MISC IO 1
69	MISC IO 2	MISC IO 2
70	MISC IO 3	MISC IO 3
71	MISC IO 4	MISC IO 4
72	EXT WAKE IN	External Wake Input
73	GND	Ground

Antena 1 (AMPSEAL 16 Water Blue)

1	Wi-Fi 1
2	NC
3	GPS
4	Wi-Fi 2

Antena 2 (AMPSEAL 16 Clairvoyant Violet)

1	CELL 1
2	CELL DIV 1
3	CELL DIV 2
4	CELL 2

TECHNICAL SPECIFICATIONS

10.1 neoVI CONNECT Technical-Specifications

Network Interfaces	100/1000BASE-T	1
	CAN-FD	8
Host Computer Interfaces	Ethernet (100/1000 BASE T only)	
	USB 3	
Operating Voltage Range	12V-24V	
Power Consumption	10W	
Operating Temperature	-40°C to +85°C	
Relative Humidity	–	
Dimensions	6.10" x 8.26" x 1.72" (15.50cm x 20.97cm x 4.375cm)	
Weight	less than 1 lb. (.45 kg)	

10.1.1 neoVI CONNECT Dimensions

SUPPORT CONTACT INFORMATION

If you have questions on our products or your application, we are here to help. Feel free to contact ICS for assistance at one of our offices.

11.1 USA Headquarters

Live support is available from 8 am to 8 pm, Monday to Friday, Eastern Standard / Daylight Time (EST/EDT).

Phone: (800) 859-6265 or (586) 731-7950, extension 1

They can also be contacted at any time through our Talk to an Expert page.

Regardless of the method of contact, our support team will get back to you as soon as possible.

11.2 ICS International Offices

For support in other regions, please refer to our website which lists the latest info for our other offices:

https://www.intrepidcs.com/worldwide/

Support is normally provided from 0900-1700 in the time zone of your local office. You can also contact our headquarters in the USA if your region is not listed.

FCC Caution.

a、§ 15.19 Labeling requirements.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

b、§ 15.21 Changes or modification warning.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

c、§ 15.105 Information to the user.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

IC Caution.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) This device may not cause interference, and

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement

*RF warning for Mobile device:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.