



# Px2 User Manual

CE

Document Revision 1.2  
Document Date: June 16, 2008  
© 2008 Dearborn Group Inc.

Permission is granted to copy any or all portions of this manual, provided that such copies are for use with the Px2 product and that the statement "© 2008 Dearborn Group Inc." is visible and legible on all copies.

The accompanying software, provided for use with the Px2, is also copyrighted. Permission is granted to copy this software for back-up purposes only.

## IMPORTANT

To ensure your success with this product, it is essential that you read this document carefully before using the hardware. Damage caused by misuse of the hardware is not covered under product warranty.

When using this manual, please remember the following:

- ❑ This manual may be changed, in whole or in part, without notice.
- ❑ Dearborn Group assumes no responsibility for any damage resulting from the use of this hardware and software.
- ❑ Specifications presented herein are provided for illustration purposes only and represent the latest revisions of hardware, software or cabling only as of the document release date.
- ❑ No license is granted, by implication or otherwise, for any patents or other rights of Dearborn Group or of any third party.

The Dearborn Group DG square logo is a registered trademark of Dearborn Group Inc. Other products that may be referenced in this manual are trademarks of their respective manufacturers.

Dearborn Group Inc.  
27007 Hills Tech Court  
Farmington Hills, MI 48331  
Phone (248) 488-2080  
Fax (248) 488-2082  
[www.dgtech.com](http://www.dgtech.com)  
[sales@dgtech.com](mailto:sales@dgtech.com)

## Table of Contents

<b>1.</b>	<b>SAFETY FIRST</b>	<b>4</b>
<b>2.</b>	<b>INTRODUCING THE PX2</b>	<b>5</b>
2.1	HOW THE Px2 WORKS	5
2.2	VEHICLE NETWORKS SUPPORTED	5
2.3	PX2 FEATURES	6
<b>3.</b>	<b>PX2 HARDWARE SPECIFICATIONS</b>	<b>6</b>
3.1	HARDWARE ATTRIBUTES	6
3.2	POWER AND NETWORK CONNECTIONS	7
3.3	PX2 STATUS INDICATORS	7
<b>4.</b>	<b>SOFTWARE SETUP</b>	<b>9</b>
<b>5.</b>	<b>HARDWARE CONFIGURATION</b>	<b>13</b>
5.1	FIRST TIME HARDWARE CONNECTION TO THE PC	13
5.2	TYPICAL HARDWARE CONNECTION TO THE PC	15
5.3	HARDWARE CONFIGURATION INFORMATION	16
5.4	HARDWARE REFLASH OF THE Px2	17
<b>6.</b>	<b>WARRANTY INFORMATION / LIMITATION STATEMENT</b>	<b>22</b>
6.1	WARRANTY INFORMATION	22
6.2	LIMITATION STATEMENT	22
<b>7.</b>	<b>RETURN MERCHANDISE AUTHORIZATION (RMA)</b>	<b>24</b>
	<b>APPENDIX A – PIN ASSIGNMENT FOR THE OBD II CABLE</b>	<b>25</b>
	<b>APPENDIX B – MECHANICAL DRAWING OF THE PX2 CASE</b>	<b>26</b>

## **1. SAFETY FIRST**

It is essential that the user read this document carefully before using the hardware.

The Px2 device is to be used by those trained in the troubleshooting and diagnostics of passenger cars, hybrid vehicles and light duty trucks. The user is assumed to have a very good understanding of the electronic systems contained on the vehicles and the potential hazards related to working in a shop-floor environment.

Dearborn Group understands that there are numerous safety hazards that cannot be foreseen, so we recommend that the user read and follow all safety messages in this manual, on all of your shop equipment, from your vehicle manuals, as well as internal shop documents and operating procedures.



- ✓ Use extreme caution when working around electricity. When diagnosing any vehicle, there is the risk of electric shock both from battery-level voltage, vehicle voltages, and from building voltage.
- ✓ Do not smoke or allow sparks or open flames near any part of the vehicle fueling system or vehicle batteries.
- ✓ Always work in an adequately ventilated area, and route vehicle exhaust outdoors.
- ✓ Do not use this system in an environment where fuel, fuel vapor, exhaust fumes, or other potentially hazardous liquids, solids, or gas/vapors could collect and/or possibly ignite, such as in an unventilated area or other confined space, including below-ground areas.

## **2. INTRODUCING THE Px2**

The Px2 is a Pass-Thru device that utilizes the SAE J2534 API and is typically used for programming automotive ECUs (Electronic Control Units). The unit can also be used to provide programming for module development, for end-of-line vehicle testing/programming or for vehicle ECU reprogramming.

The Px2 is also a useful tool for vehicle diagnostics, ECU development, general module design, hardware-in-the-loop simulation or anywhere that communication with a vehicle network is required.



The Px2 Device

### **2.1 HOW THE Px2 WORKS**

The user application on the PC sends and receives data to and from the vehicle using SAE J2534 function calls to the Px2. The Px2 provides support for the most current version of the J2534 API (Version 04.04).

Please refer to Sections 5.1 and 5.2 for details of hardware connection to the PC and access to the vehicle protocol.

### **2.2 VEHICLE NETWORKS SUPPORTED**

- CAN (ISO 11898, SAE J2284 and ISO 15765 Diagnostics)
- ISO 9141-2 and ISO 14230 KWP 2000

## **2.3 Px2 FEATURES**

- Connects to a PC via the included USB cable and provides a USB 2.0 connection for fast downloads (operates at full network speed with fast and efficient data transfers).
- Connects to a vehicle via the OBD II cable provided (or a custom cable may also be used).
- Capable of running the SAE J1699-3 Vehicle OBD II Compliance Software.
- On or off-board module programming capability (using the J2534 API).
- The Px2 device can be used for vehicle diagnostics or network module development.

## **3. Px2 HARDWARE SPECIFICATIONS**

### **3.1 HARDWARE ATTRIBUTES**

#### 3.1.1 Physical Dimensions

Height:	0.88 in.
Width:	2.62 in.
Depth:	4.50 in.

#### 3.1.2 Component Weight

Px2 unit	3.1 oz.
OBD II cable	8.0 oz.
USB cable	2.0 oz.

### 3.1.3 Px2 Electrical Characteristics

Nominal voltage:	12 VDC
Minimum voltage:	9 VDC
Maximum voltage:	32 VDC
Current consumed:	Less than 200 mA at 12 VDC
Temperature range:	-40° C to +85° C

## 3.2 POWER AND NETWORK CONNECTIONS

### 3.2.1 OBD II Cable

Power for the Px2 unit and vehicle network access is provided via the supplied OBD II cable that is connected to the J1962 connector on the vehicle.

### 3.2.2 Custom Cable

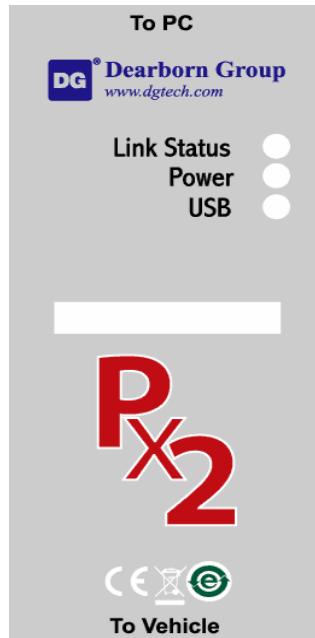
A custom cable may also be used to provide power to the Px2 unit and establish network connections to the vehicle via the DB-9 female connector on the Px2 unit. Please see Appendix A for pin assignment information for this DB-9 connector.

## 3.3 Px2 STATUS INDICATORS

The Px2 has three status LEDs that indicate activity of the following functions:

- **Link Status:** Indicates whether or not the vehicle network connection has been established and whether or not there is activity on the bus.
- **Power:** Indicates when the Px2 is connected to a power source.
- **USB:** Indicates that the Px2 has established a connection to the PC and whether or not the link is “active.”

The figure below depicts the label for the Px2 unit and the table below explains the status LED indications for the *Link Status*, *Power* and *USB* LEDs.



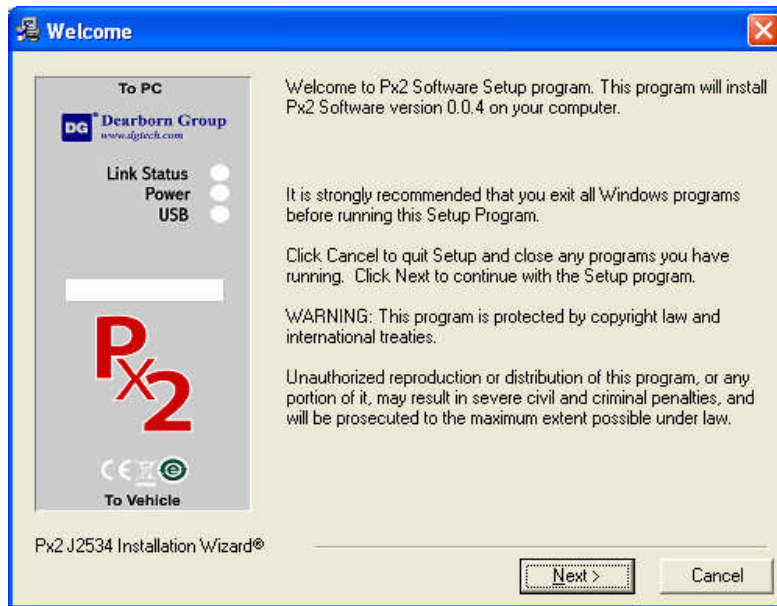
Px2 Label

LED Name	LED State	Indication
Link Status	Off	There is no vehicle network activity.
	Blink (Red)	There is activity on the vehicle CAN bus.
	Blink (Green)	There is activity on the vehicle ISO 9141 bus.
Power (Red)	Off	No power is being supplied to the unit.
	On (Solid)	The Px2 unit is being powered.
USB	Off	The PC has not initialized communication with Px2 via the USB data link.
	On (Solid Red)	The PC has initialized communication with the Px2 via the USB data link, but no USB activity is present.
	On (Alternating: Red/Green)	There is traffic activity on the PC / Px2 connection via the USB data link.

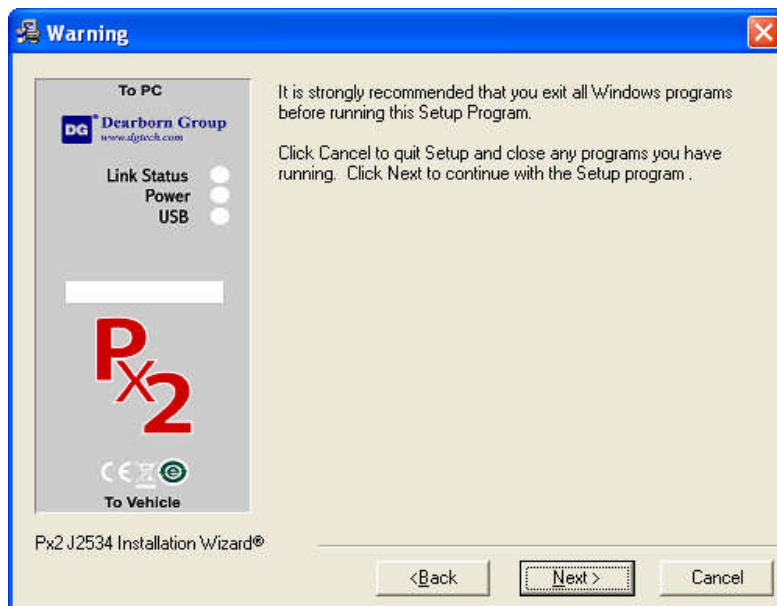
LED Explanations

## 4. SOFTWARE SETUP

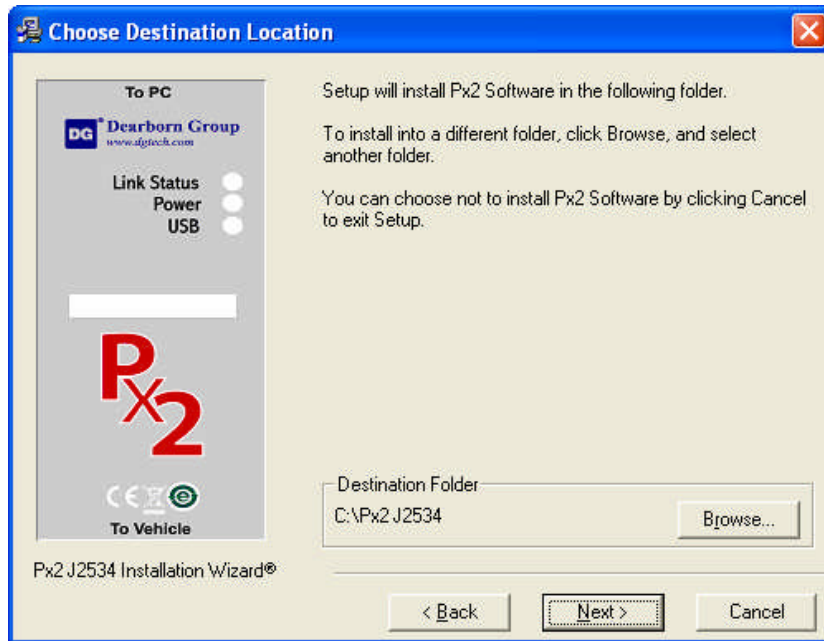
1. Locate the file "Setup\_Px2\_J2534.EXE" from the CD, click on it to start the Software Setup, and then click **Next** to proceed.



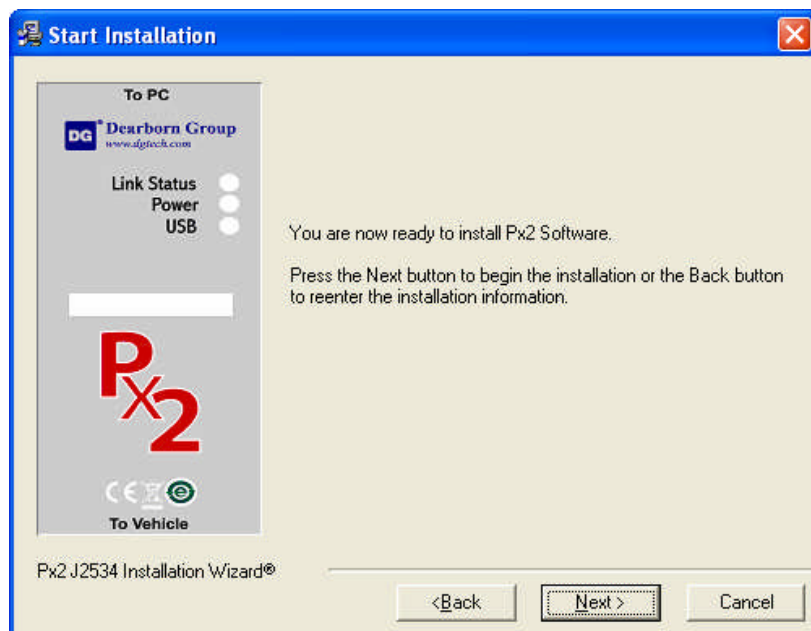
2. Click **Next** after exiting all Windows programs.



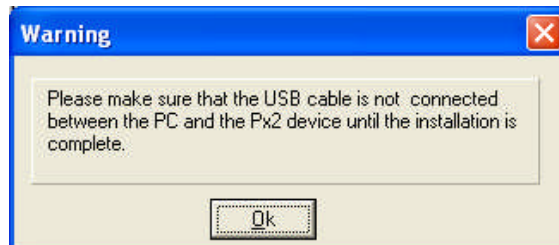
3. Choose Destination Location for the installation. The default location is C:\Px2 J2534. Click **Next** to proceed.



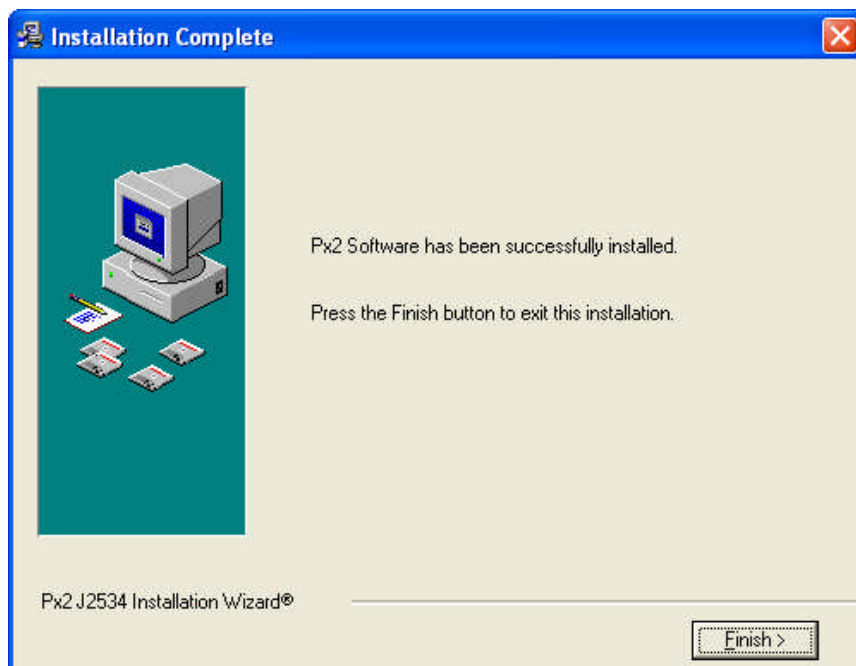
4. Click **Next** to proceed.



5. Make sure that you do **NOT** have the Px2 hardware connected to the PC's USB port. Click **OK** to proceed.

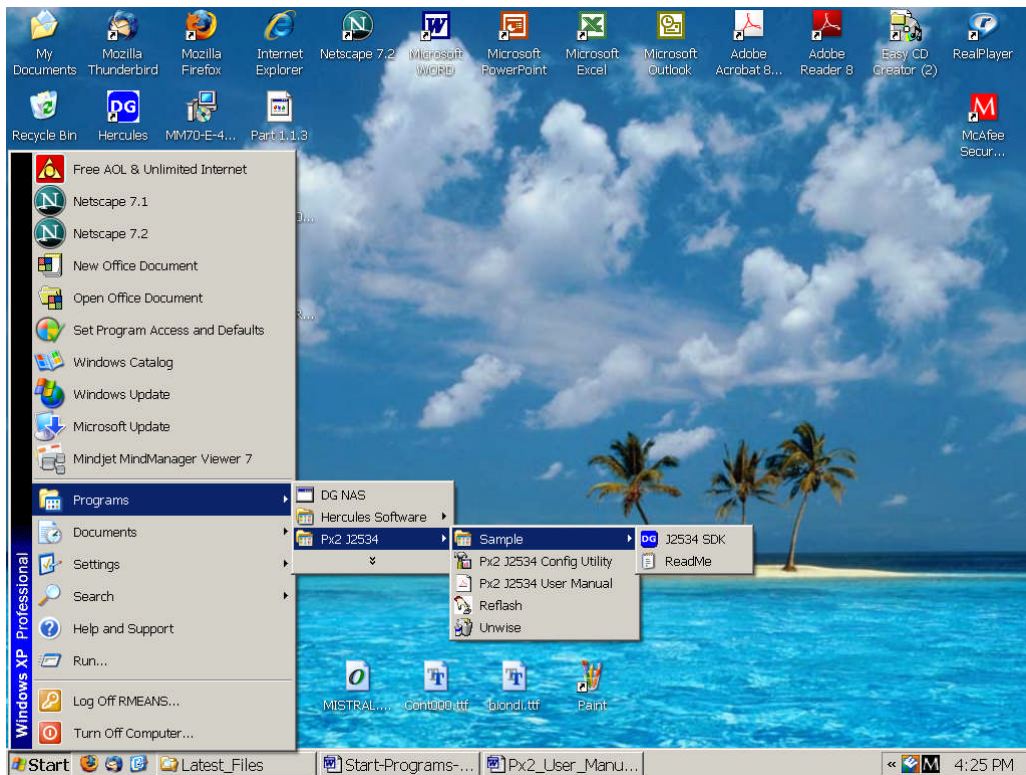


6. Installation is complete; click **Finish**.



**NOTE:**

Px2 applications and the user manual can be selected from **Start | Programs | Px2 J2534**.



## **5. HARDWARE CONFIGURATION**

### **5.1 FIRST TIME HARDWARE CONNECTION TO THE PC**

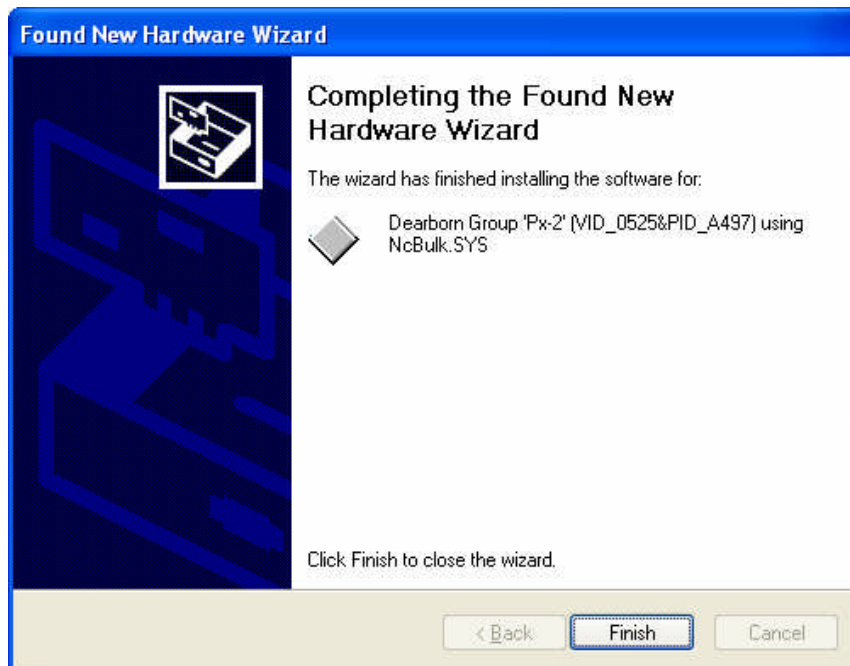
**Step 1:** Provide power to the Px2 by connecting the supplied OBD II cable from the DB-9 (female) connector on the Px2 to the J1962 connector on the vehicle. (Alternately, the unit may be powered and connected to a network via a custom cable.) The Power LED must appear solid **Red**. When the “Found New Hardware Wizard” screen appears, select: **Yes, now and every time I connect a device** (new device only). Click **Next** to continue.



**Step 2:** Select: **Install the software automatically (Recommended)** and Click **Next**.

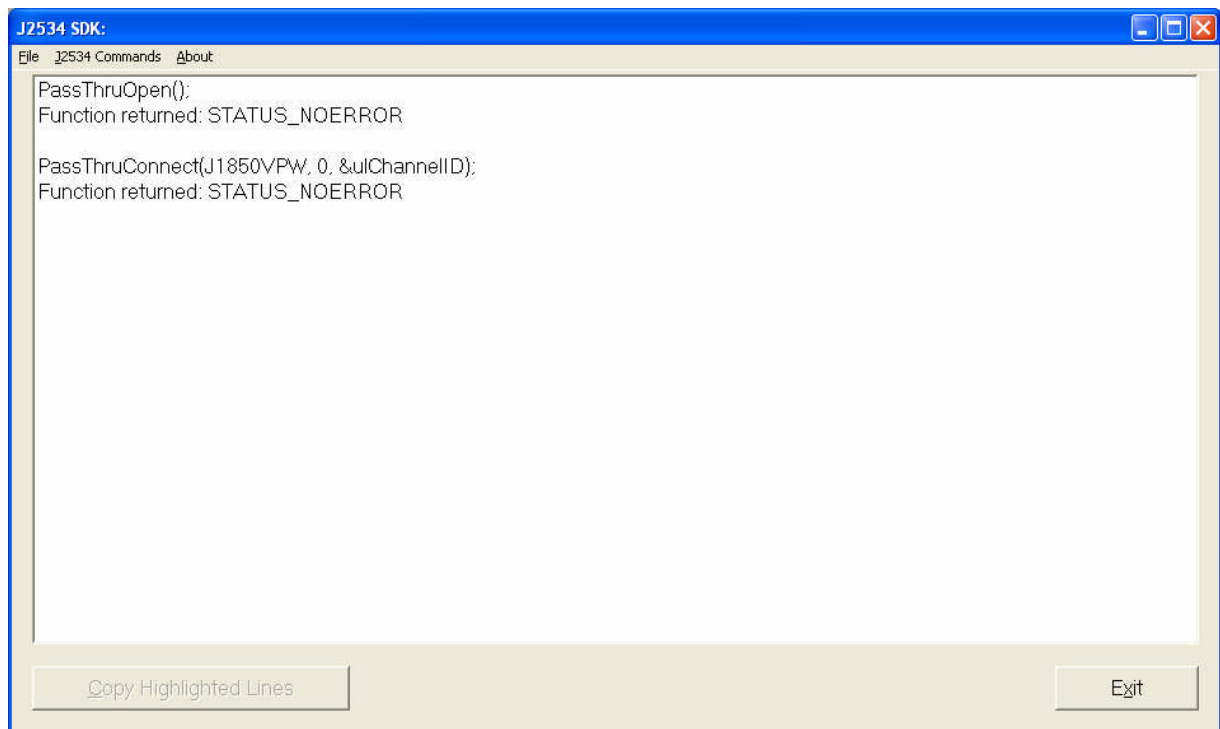


**Step 3:** Click **Finish** and the Hardware Ready to use prompt will appear at the bottom right of the Windows screen.



## 5.2 TYPICAL HARDWARE CONNECTION TO THE PC

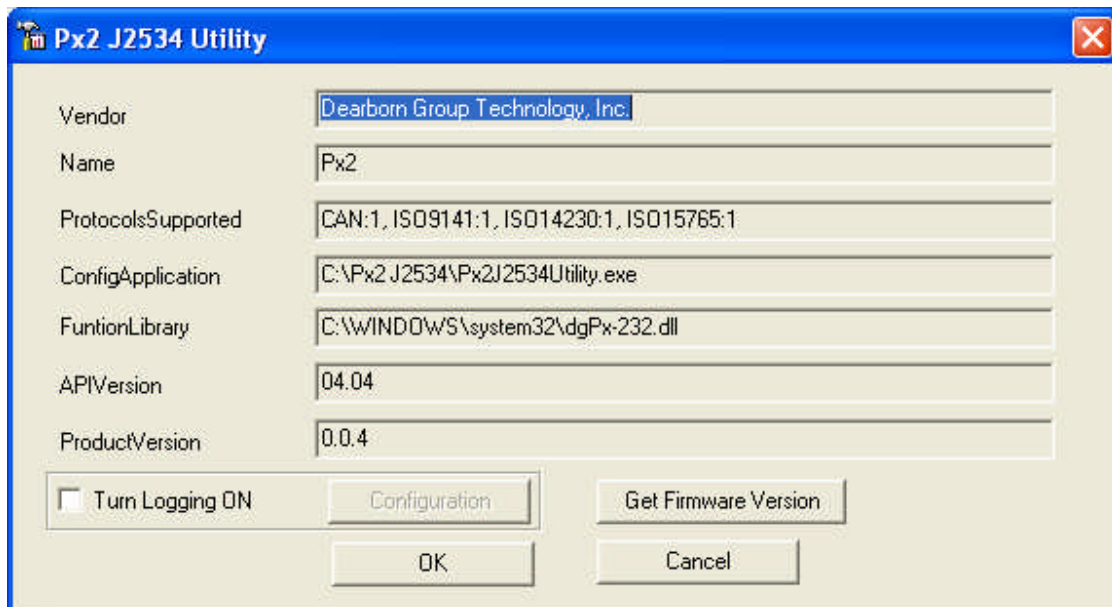
- Step 1:** Provide power to the Px2 by connecting the supplied OBD II cable from the DB-9 (female) connector to a vehicle's J1962 connector. The Power LED will appear solid **Red**.
- Step 2:** Connect the provided USB cable to the PC that has the Px2 Setup software installed. Verify that the Power LED appears solid **Red** and that the USB LED also appears solid **Red**.
- Step 3:** Using an application such as the DG 2534 SDK (Software Development Kit), shown below, a user can establish a link to the Px2 hardware with a vehicle protocol or an Electronic Control Module (ECU). Note that when this occurs the USB LED alternates between **Red** and **Green**, indicating USB activity.



### 5.3 HARDWARE CONFIGURATION INFORMATION

The hardware version, protocol support, and other details may be obtained by running the Px2 J2534 Utility (**Start | Programs | Px2 J2534**).

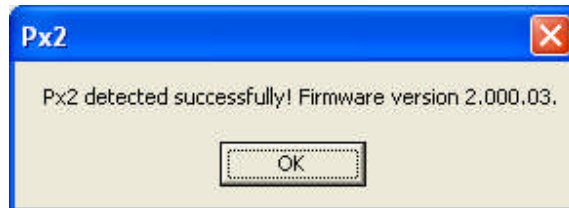
The **Turn Logging ON** checkbox (on the Px2 J2534 Utility screen) enables the **Configuration** button. Selecting the **Configuration** button allows the user to set Logging Type and Logging Method to create a Px2 J2534 DLL log:



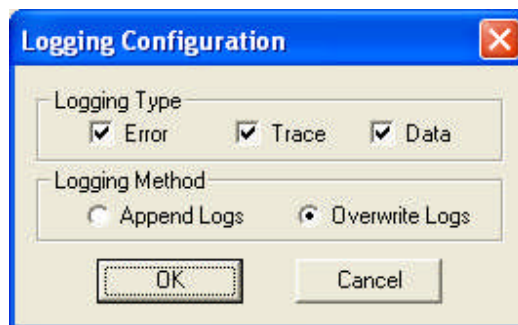
**Protocols Supported:**     **CAN** (ISO 11898, SAE J2284 & ISO 15765 Diagnostics)  
                                  **ISO 9141-2**, including **ISO 14230 KWP 2000**

**Application Program Interface (API):**     **SAE J2534** API Version: 04.04

The **Get Firmware Version** button provides the Firmware version of the Px2 hardware:



The **Logging Configuration** screen allows the user to select the *Logging Type* and the *Logging Method*.

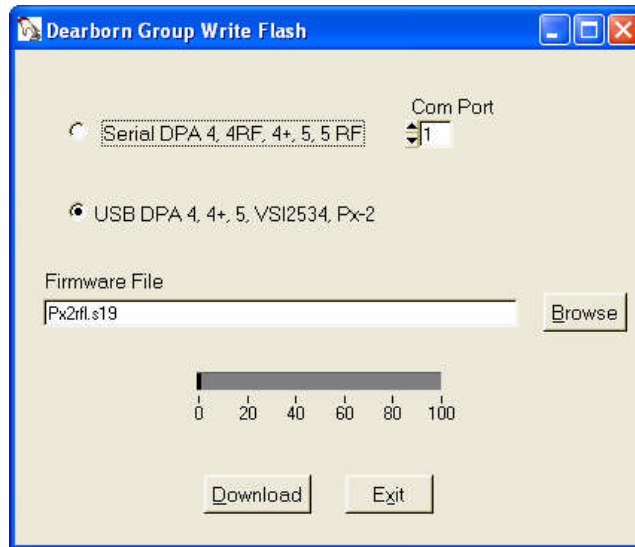


**Note:** Do not have any other application running that uses the J2534 library.

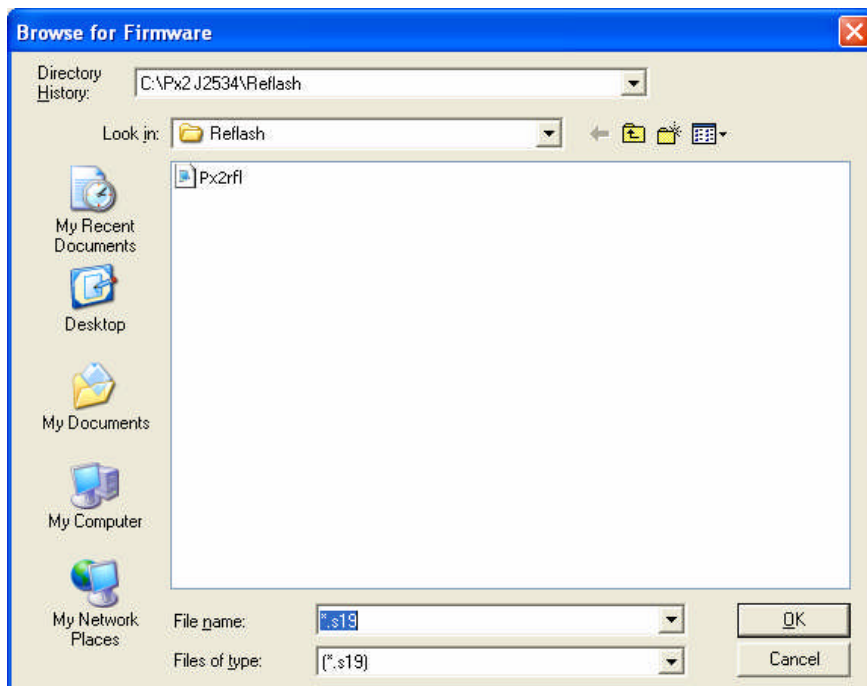
## 5.4 HARDWARE REFLASH OF THE PX2

To Reflash the hardware, run the Reflash application (**Start | Programs | Px2 J2534**).

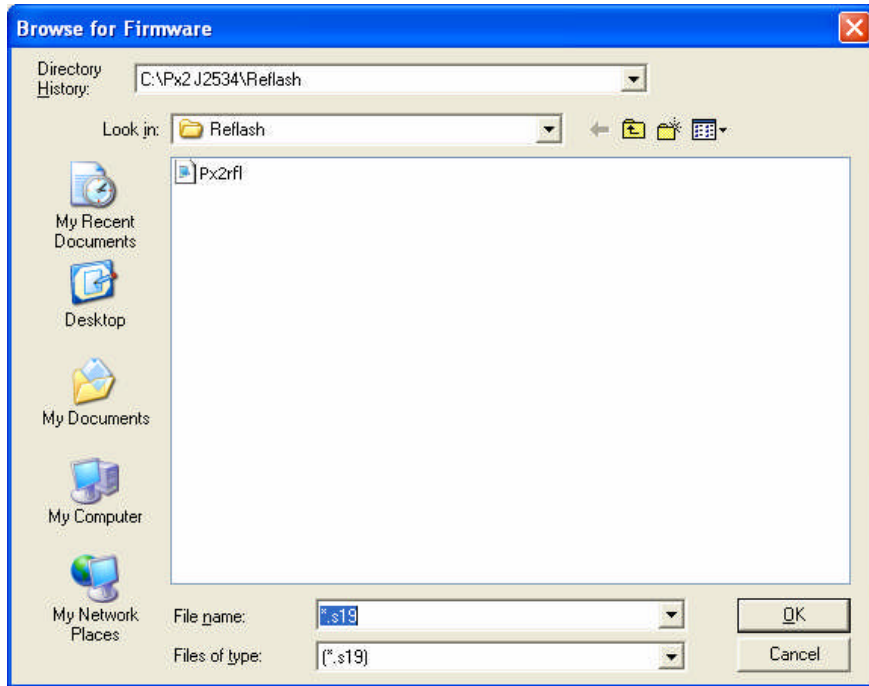
**Step 1:** Select the **USB DPA 4, 4+, 5, VSI2534, Px2** button; click **Browse**.



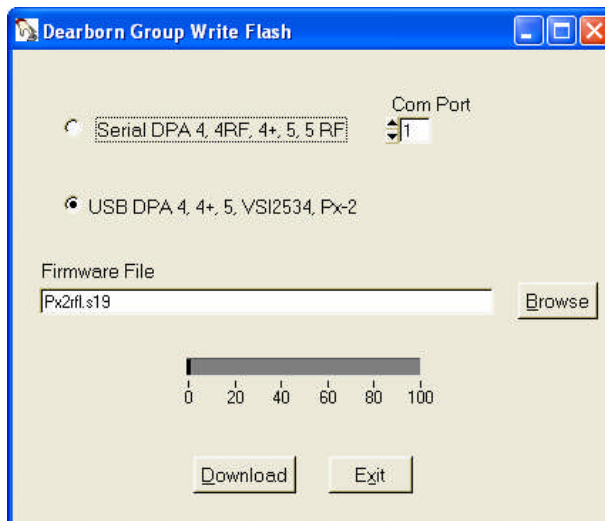
**Step 2:** Select the correct \*.S19 file.



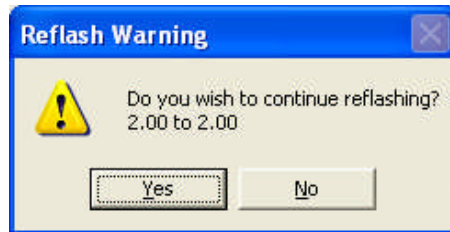
**Step 3: Click OK.**



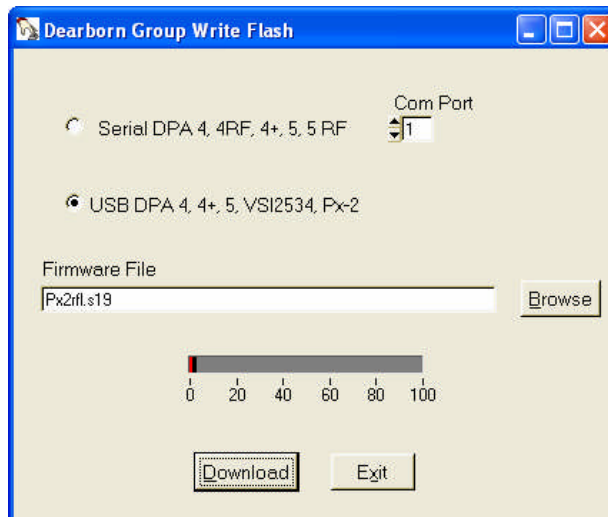
**Step 4: Click Download.**



**Step 5:** Click **Yes** to proceed or **No** to cancel.



**Note:** Clicking **Yes** will display the following progress bar.



If a problem should occur, the following dialog appears:



**Important:** Please be sure to power cycle the Px2 device prior to clicking OK.

**Note:** A “power cycle” consists of disconnecting power to the device and then reconnecting power to the device.

**Step 6:** Write Flash was successful, power cycle the Px2 device and click **OK**.



## **6. WARRANTY INFORMATION / LIMITATION STATEMENT**

### **6.1 WARRANTY INFORMATION**

The Dearborn Group Px2 is warranted against defects in materials and workmanship for one (1) year following date of shipment. Cables (both USB and vehicle) are warranted for 90 days.

Dearborn Group will, at its option, repair or replace at no cost to the customer, products which prove to be defective during the warranty period, provided the defect or failure is not due to misuse, abuse, or alteration of the product. The customer is responsible for shipment of the defective product to DG. This warranty does not cover damage to any item that Dearborn Group determines has been damaged by the customer's abuse, misuse, negligence, improper assembly, modification, or operation of the product.

A Return Merchandise Authorization (RMA) number must be issued to the customer from our Technical Support Department at (248) 488-2080 and must be included with the product being returned (for more details, see section 7, "Return Merchandise Authorization [RMA]").

### **6.2 LIMITATION STATEMENT**

#### **6.2.1 General Limitation and Risk Assignment**

To the maximum extent permitted by applicable law, Dearborn Group Inc. and its suppliers provide support services on an "as-is" basis and disclaim all other warranties and conditions not specifically stated herein, whether express, implied or statutory, including, but not limited to, any warranties of merchantability or fitness for a particular purpose, lack of viruses, accuracy or completeness of responses, results, lack of negligence or lack of workmanlike effort, and correspondence to description. The user assumes the entire risk arising out of the use or performance of the device, its operating system components, and any support services.

### 6.2.2 Exclusion of Incidental, Consequential and Certain Other Damages

To the maximum extent permitted by applicable law, in no event shall Dearborn Group Inc. or its suppliers be liable for any special, incidental, indirect or consequential damages whatsoever, including but not limited to: damages for loss of profit, loss of confidential or other information; business interruption; personal injury; loss of privacy, failure to meet any duty (including good faith or of reasonable care); negligence; and any other pecuniary or other loss related to the use of or the inability to use the device, components or support services or the provision of or failure to provide support services or otherwise in connection with any provision, even if Dearborn Group Inc. or any supplier has been advised of the possibility of such damages.

### 6.2.3 Limitation of Liability and Remedies

Notwithstanding any damages that you might incur for any reason whatsoever (including, without limitation, all damages referenced above and all direct or general damages), in no event shall the liability of Dearborn Group Inc. and any of its suppliers exceed the price paid for the device. The user assumes the entire risk and liability from the use of this device.

### 6.2.4 Right to Revise or Update without Notice

Dearborn Group Inc. reserves the right to revise or update its products, software and/or any or all documentation without obligation to notify any individual or entity.

### 6.2.5 Governance

The user agrees to be governed by the laws of the State of Michigan, USA, and consents to the jurisdiction of the state court of Michigan in all disputes arising out of or relating to the use of this device.

### 6.2.6 Contact

Please direct all inquiries to:

Dearborn Group Inc.  
27007 Hills Tech Court  
Farmington Hills, MI 48331-5723  
USA

## **7. RETURN MERCHANDISE AUTHORIZATION (RMA)**



Under no circumstances will Dearborn Group Inc. accept a returned product without that product first having been assigned an RMA number by the Technical Support Department of Dearborn Group Inc.

Once the Technical Support Department has determined that there may be a physical problem with your device, Technical Support will issue you an RMA number. You may then return the product, along with the documentation of ownership (proof of purchase & price), to the following address:

Dearborn Group Inc.  
Product Service/Repairs  
Attn: RMA# xxxxxxx  
27007 Hills Tech Court  
Farmington Hills, MI 48331-5723

Telephone: (248) 488-2080  
Fax: (248) 488-2082

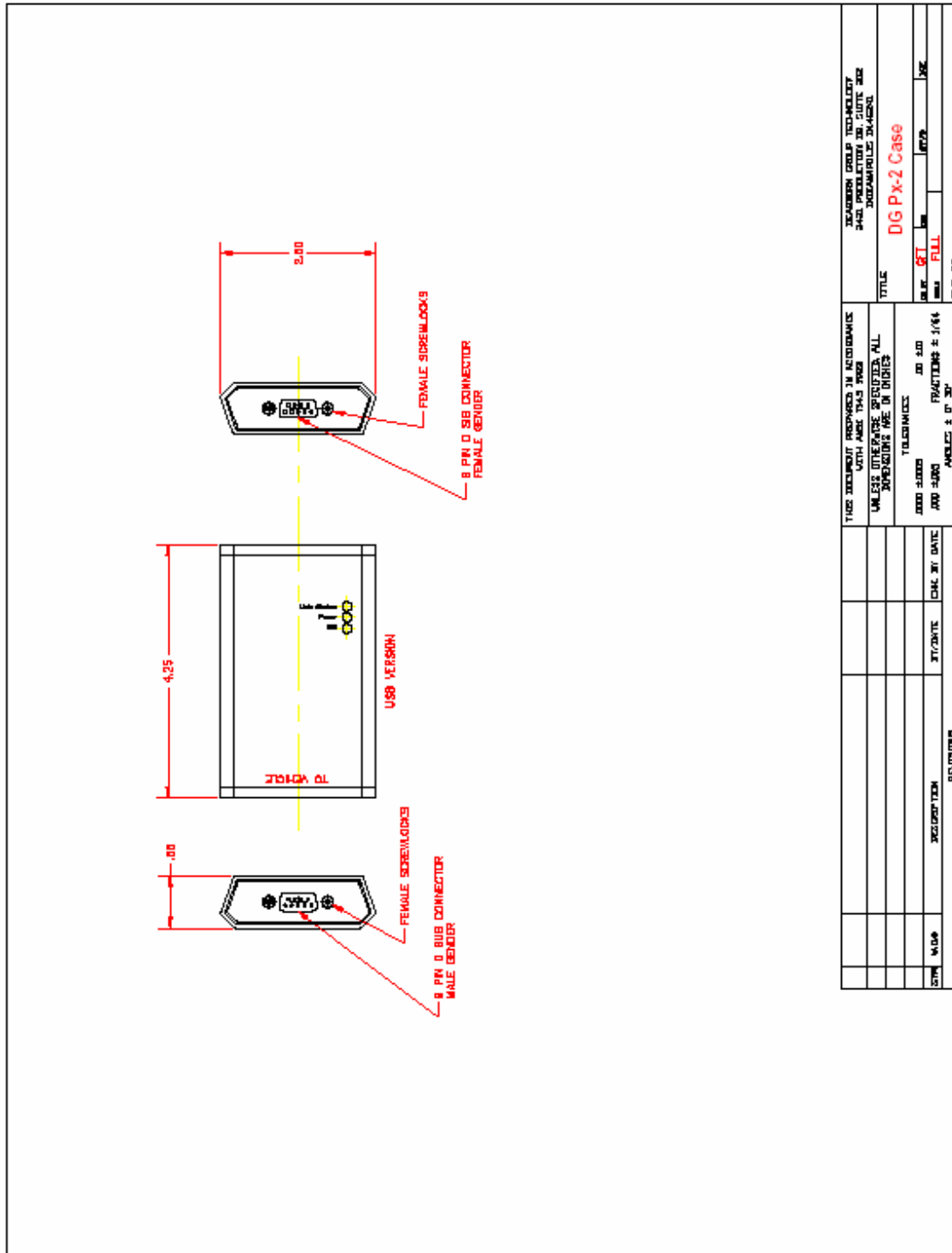
## APPENDIX A – PIN ASSIGNMENT FOR THE OBD II CABLE

### Px2 OBD II Cable Pin Assignment (DB-9 Connector to J1962 Vehicle Connector)

Px2 DB-9 Female Connector	Use / Allocation	J1962 Connector
--	UNUSED (Discretionary*)	1
4	UNUSED (J1850 Bus positive)	2
--	UNUSED (Discretionary*)	3
--	UNUSED (Chassis ground)	4
5	Signal ground	5
7	CAN_High (ISO 15765-4)	6
1	K line – ISO 9141-2 / Keyword	7
--	UNUSED (Discretionary*)	8
--	UNUSED (Discretionary*)	9
3	UNUSED (J1850 Bus negative)	10
--	UNUSED (Discretionary*)	11
--	UNUSED (Discretionary*)	12
--	UNUSED (Discretionary*)	13
2	CAN_Low (ISO 15765-4)	14
6	L line – ISO 9141-2 / Keyword	15
8	Positive Battery Voltage	16

\* Use of this pin is left to the discretion of the vehicle manufacturer.

## APPENDIX B – MECHANICAL DRAWING OF THE Px2 CASE



THIS DRAWING IS THE PROPERTY OF DEARBORN GROUP INC. IT IS TO BE USED ONLY FOR THE PROJECT AND NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.	
TITLE: <b>DG Px-2 Case</b>	
DATE: 07/11/08	BY: [Signature]
REV: 01	DESCRIPTION: REVISED
DESIGNED BY: [Name]	CHECKED BY: [Name]
DRAWN BY: [Name]	DATE: [Date]
SCALE: FULL	PROPORTIONS: ± 1/64
DWG. NO.	ANNO: ± 0° 30'