

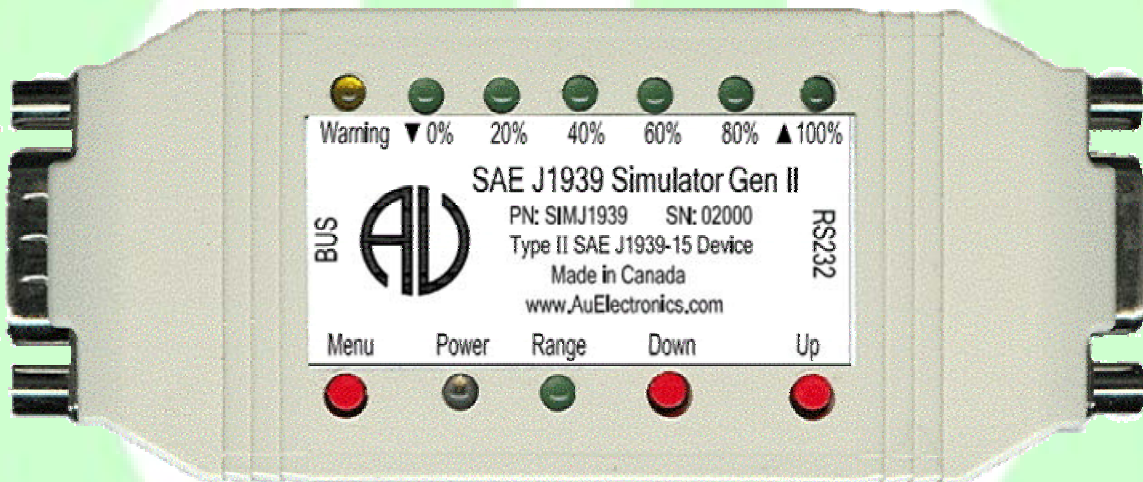


# Au SAE J1939 Simulator Gen II 1.00A User Manual

Rev. G

Au Group Electronics

May 2019



All Copyrights are reserved by Au Group Electronics. 2007 - 2019  
This document can **NOT** be freely distributed without written approval from Au Group Electronics



## Table of Contents

Table of Contents .....	2
Chapter 1 - Introduction .....	3
1.1. Typical SAE J1939-15 Network Topology with Au SAE J1939 Simulator .....	3
1.2. Major Hardware Features .....	3
1.3. Major Operating Features .....	6
1.4. Eight Editions of Au SAE J1939 Simulators .....	6
1.5. Basic Functions of Each Edition .....	6
1.6. License /Firmware Upgrade and Annual Support Service .....	7
Chapter 2 - Supported SAE J1939 Parameters .....	8
2.1. Value Package editions .....	8
2.2. Engine Basic editions .....	8
2.3. Engine Premium editions .....	8
2.4. Vehicle Platinum editions .....	8
Chapter 3 - Operating Instructions .....	9
3.1. Power On .....	9
3.2. Operating Mode (Static/Dynamic) .....	9
3.3. Push Button Function .....	9
3.4. LED Indicator Status .....	10
Chapter 4 - Au J1939 Simulator Remote Terminal GUI .....	13
4.1. Control Panel – Step 1: Connect to J1939 Simulator .....	15
4.2. Control Panel – Step 2: Remote control the J1939 Simulator .....	16
4.3. Display Panel – Engine info and Warning Lamps .....	16
4.4. Display Panel – ABS info and Warning Lamps .....	16
4.5. Display Panel – Transmission info and Warning Lamps .....	17
4.6. Display Panel – Value Package Parameters .....	17
4.7. Display Panel – Engine Basic Parameters .....	17
4.8. Display Panel – Engine DM1 .....	17
4.9. Display Panel – Engine DM2 .....	19
4.10. Display Panel – Engine Configuration .....	20
4.11. Display Panel – ABS DM1 .....	20
4.12. Display Panel – Transmission DM1 .....	20
Chapter 5 - Data Configuration .....	21
Appendix A - Remote Terminal GUI Installation Guide .....	28
Appendix B - CAN Baud Rate Configuration .....	30
Appendix C - License Management Toolset .....	31
Appendix D - Au PIC Serial Bootloader Application Note .....	35

## Chapter 1 - Introduction

Au SAE J1939 Simulator Gen II 1.00A, a family of well designed devices, is capable of simulating majority of SAE J1939 signals on a SAE J1939 network (Figure 1-1).

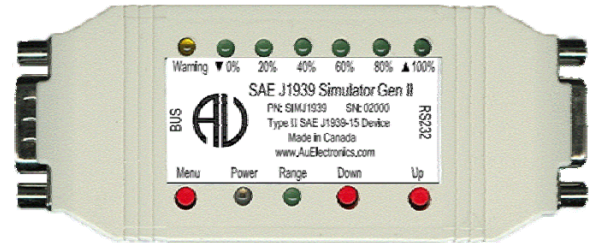


Figure 1 - 1 Au J1939 Simulator Gen II

### 1.1. Typical SAE J1939-15 Network Topology with Au SAE J1939 Simulator

A typical SAE J1939-15 network topology with Au SAE J1939 Simulator is illustrated in Figure 1-2.

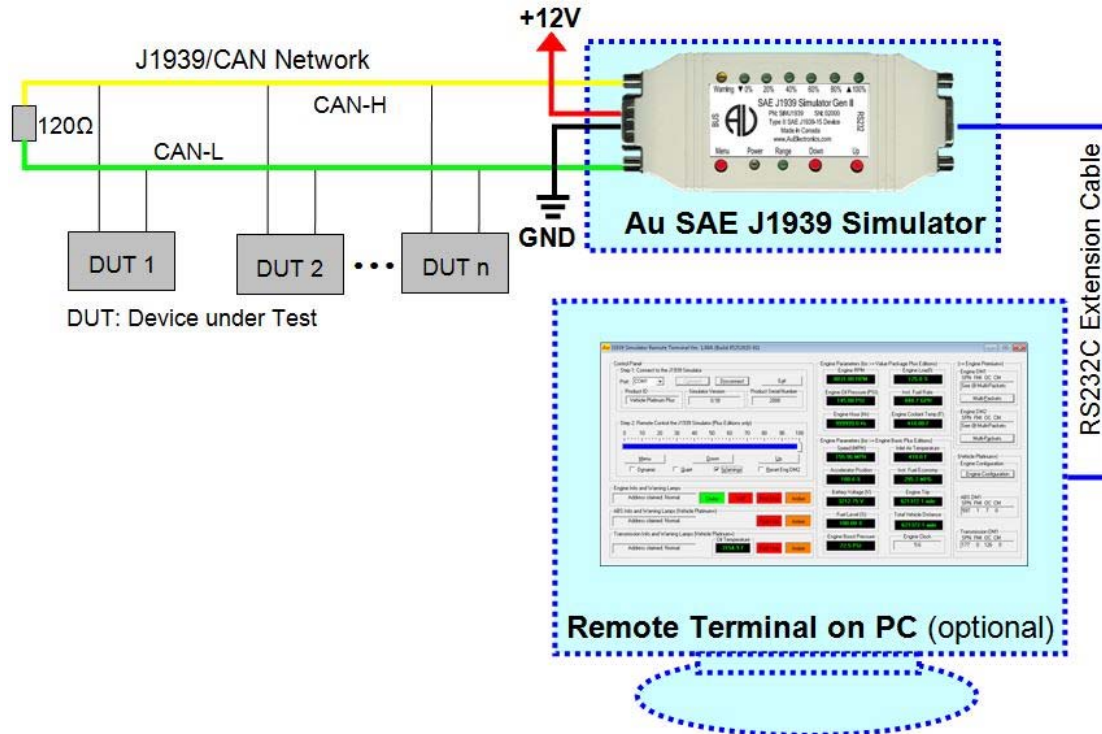


Figure 1-2 Typical SAE J1939-15 network topology with Au SAE J1939 Simulators

### 1.2. Major Hardware Features

- **SAE J1939-15 Type II ECU:** contain an internal 120 ohm load resistor for easy network setup
- **TVS (Transient Voltage Suppressor)** protection on CAN bus
- **Compact size:** 4-1/8" L X 1-3/4"W X 7/8"H
- **Enclosure color:** Black or PC white
- **Operating temperature:** -4 °F to 185 °F (-20 °C to 85 °C)
- **Power supply:** +12V DC nominal, 250mA max
- **9 LED indicators:** Power, Range, Warning, ▼0%, 20%, 40%, 60%, 80%, ▲100%
- **1 buzzer**
- **3 push buttons:** simulated SAE J1939 signals can be adjusted by 3 push buttons: Menu, Down, Up
- **1 DB9 Male "BUS" Interface:** for power supply and CAN/J1939 network connection (Figure 1-3)
- **1 RS232 interface:** for in field firmware update, license management, and computer remote control (for **Plus** editions only).



**Pin 1: GND**  
**Pin 5: +12V DC**  
**Pin 6: CAN-L**  
**Pin 7: CAN-H**

Figure 1 - 3 Pin-out for BUS side DB9 male connector



**Pin 2: To PC RXD**  
**Pin 3: from PC TXD**  
**Pin 5: GND**

Figure 1 - 4 Pin-out for RS232 side DB9 female connector

Au J1939 Simulator plus edition can be connected to a PC either through RS232 port or USB port.

Au J1939 Simulator plus edition can be connected to a PC through RS232 serial port using RS232 serial extension cable (part # CBL-RS232-01), as shown in Figure 1 - 5.

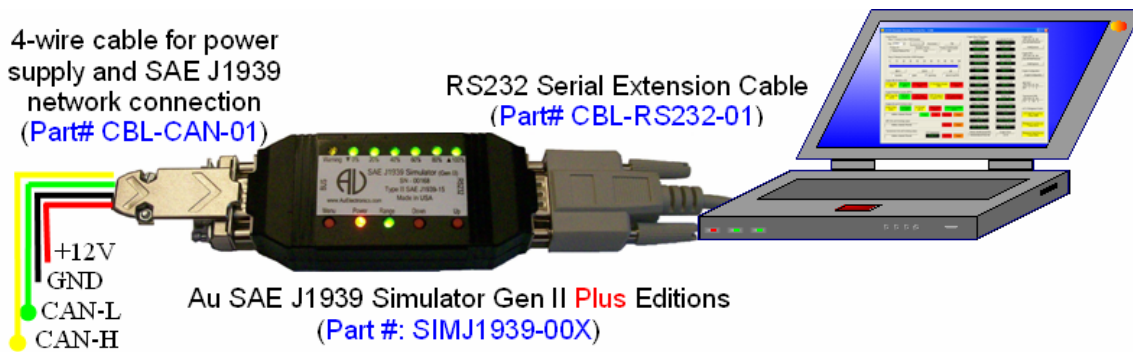


Figure 1-5 Connection of Au J1939 Simulator (Gen II) plus editions to PC with RS232 port


Au J1939 Simulator plus edition can be connected to a PC through USB port using USB to RS232 serial convert cable (part # CBL-USB-232), as shown in Figure 1 - 6.








Figure 1-6 Connection of Au J1939 Simulator (Gen II) plus editions to PC with USB port

The following cables and power supply are optional components for different application, they are sold separately.

Table 1-1 Necessary accessories for Au J1939 Simulator

 <p>CBL-CAN-01</p>	<p>A 4-wire twisted and shield pigtail cable, it can be used to connect Au J1939 simulator on the BUS side to power supply and CAN network.</p> <p>One end of the cable is a DB9 connector which mates with the DB9 male connector at “BUS” side.</p> <p>The other end of the cable consists of 4 pigtail wires which can connect power supply and CAN network.</p> <p>Red wire: Power supply, e.g. +12V DC Black wire: Ground Yellow: CAN-H Green: CAN-L</p>
-------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



<p>CBL-CAN-485-01</p> 	<p>A 6-wire color coded cable which can be used for Au J1939 devices and Au J1708 devices.</p> <p>One end of the cable is DB9 female connector; it is designed to mate with Au devices on BUS side.</p> <p>The other side of the cable is a pig tail with 3 pairs of twisted color coded wires:</p> <p>Red wire: Power supply, e.g. +12V DC      Black wire: Ground          Yellow wire: CAN-High                              Green wire: CAN-Low          Violet: J1708A+                                      Brown: J1708B-</p>
<p>CBL-CAN-485-02D</p> 	<p>CBL-CAN-485-02D is a CAN/J1939/J1708/J1587 cable equipped with a DB9 female connector, dual SAE 9-way Receptacles (green for 500K and black for 250K CAN baud rate) and a power Jacket</p> <p>CBL-CAN-485-02D cable provides power supply, J1708/J1587 and CAN network connection similar to what's available on trucks, RVs and School buses.</p> <p>One end is a DB9 female connector, the other end are dual HD10 Serial 9-way SAE compatible Receptacles (green for 500K CAN baud rate and black for 250K CAN baud rate) .</p> <p>It also includes a Power Supply Jacket (2.1 mm Positive center), which can supply power to all devices connected on the cable. For SAE J1939-11, J1939-14, 250Kbps and 500Kbps networks.</p>
<p>PWR-912V-CP</p> 	<p>Wall mount AC/DC power supply can supply power to all devices connected to CBL-J1708-02 or CBL-CAN-485-02.</p> <p>Specification:</p> <ul style="list-style-type: none"> <li>* Positive center</li> <li>* Connector style: 2.1mm I.D. x 5.5mm O.D. x 12mm Female (compatible with the power jacket of CBL-J1708-02 and CBL-CAN-485-02)</li> <li>* Voltage input: 110~120V AC Input</li> <li>* Voltage output: 12V DC</li> <li>* Current output: 500mA Max.</li> <li>* Inrush current: 40A Maximum</li> <li>* Power: 6.0W</li> <li>* Line Regulation: +/- 2%</li> <li>* Load Regulation: +/- 5%</li> </ul>
<p>CBL-RS232-01</p> 	<p>RS232 Serial Extension Cable can be used to connect computer Serial port to Au J1939 / J1708 products (on RS232 Side).</p> <p>Major Features:</p> <ul style="list-style-type: none"> <li>* Fully shielded to prevent unwanted EMI/RFI interference</li> <li>* Fully molded connectors with thumbscrews provide a quick and easy connection every time</li> <li>* Connectors: DB9 Male to DB9 Female</li> <li>* All 9 connector pins are wired straight through</li> </ul>
<p>CBL-USB-232</p> 	<p>The USB to Serial Converter cable can be used to connect computer USB port to Au J1939 / J1708 products (on RS232 Side). It acts as a bridge between a USB port and a standard Serial (RS232) port.</p> <p>It is Vista, Win7, and XP compatible.</p> <p>Three LED are included, Power, TX and RX. Power LED is on when USB power is supplied. TX LED will blink when COM port is transmitting. RX LED will blink when COM port is receiving.</p> <p>It is compatible with all Au Group Electronics system products, J1939 Simulators, J1708 Simulators, FMS Simulators, J1939 Interpreters, J1708 Interpreters, J1939 MCS, and J1939 DCS.</p>

### 1.3. Major Operating Features

- **Smart features:** Recall last operating mode at power-on, capable of generating dynamic data, etc.
- **Ease of use:** No software setup experience or CAN protocol configuration skill is required. After a network is physically connected, apply power supply, it will dynamically generate J1939 data when in dynamic mode.
- **Static Mode and Dynamic Mode**
  - Static mode output static J1939 signals, they can be changed manually
  - Dynamic mode automatically change the output value of SAE J1939 signals
  - Two modes can be switched easily (*by Press and hold both **Menu** and **Up** buttons until a long beep is heard*)
- **PC Remote Terminal GUI (for "Plus" editions only):** Display simulated J1939 signal on a computer screen
- **Configurable CAN Baud Rate:** Device CAN Baud Rate can be set at 250K, 500K, 62.5K, 125K, or 1M bps
- **All push button control functions are available on PC Remote Terminal GUI for "Plus" editions only**
- **Easy in-field license upgrade feature** with Au License Management Toolset.
- **In-field firmware update capability**
- **Annual support and minor upgrade services are available**
- **Custom design is available upon request**

### 1.4. Eight Editions of Au SAE J1939 Simulators

Eight editions of Au SAE J1939 simulator (Gen II) 1.00A are provided to meet various users needs (4 **non-plus** editions and 4 **plus** editions). The **Plus** editions have all the functions of **Non-plus** editions, plus a **PC Remote Terminal GUI** program, which can be used to control and display detail information of simulated SAE J1939 signal on PC screen (detail information is available at chapter 4.)

**Plus Edition = Non-Plus Edition + PC Remote Terminal GUI Program**

The part# for 8 editions of Au SAE J1939 simulator and necessary accessories are summarized in Table 1-2.

Table 1-2 Part# for 8 editions of Au SAE J1939 simulator Gen II 1.00A

Summary of Au SAE J1939 Simulators and Accessories		Part#
<b>Non-Plus Edition</b>	Au SAE J1939 Simulator ( <b>Value Package</b> Edition)	SIMJ1939-013
	Au SAE J1939 Simulator ( <b>Engine Basic</b> Edition)	SIMJ1939-001
	Au SAE J1939 Simulator ( <b>Engine Premium</b> Edition)	SIMJ1939-002
	Au SAE J1939 Simulator ( <b>Vehicle Platinum</b> Edition)	SIMJ1939-003
<b>Plus Edition</b>	Au SAE J1939 Simulator ( <b>Value Package Plus</b> Edition)	SIMJ1939-014
	Au SAE J1939 Simulator ( <b>Engine Basic Plus</b> Edition)	SIMJ1939-004
	Au SAE J1939 Simulator ( <b>Engine Premium Plus</b> Edition)	SIMJ1939-005
	Au SAE J1939 Simulator ( <b>Vehicle Platinum Plus</b> Edition)	SIMJ1939-006
<b>Service</b>	1 year support and minor upgrades for Au SAE J1939 Simulator	SVS-SIM-J1939

### 1.5. Basic Functions of Each Edition

#### Value Package editions:

- "Statically" or "dynamically" generate 6 most frequently used engine parameters
- Two push buttons (**Up** and **Down**) are used in "static mode" to adjust data outputs
- In "dynamic mode", data cycles automatically in its SAE defined range
- LEDs indicate the control step value and reflect push button operations
- Buzzer sound also reflects push button inputs, and can be enabled/disabled

#### Engine Basic editions:

- Includes all Value Package edition functions
- "Statically" or "dynamically" generate 23 most frequently used engine parameters

#### Engine Premium editions:

- Includes all Engine Basic edition functions
- Includes Premium features on SAE J1939 Transport Protocols:
  - Engine DM1/DM2 warnings (support both single packet and multi-packets)

- Engine “Red Stop” and “Amber” lamp warnings
- Engine DM3

**Vehicle Platinum editions:**

- Includes all Engine Premium edition functions
- Includes Vehicle Network features (3 controller applications have been implemented):
  - **ABS** related signals
  - **Transmission** related signals
  - **Engine Configurations**

**1.6. License /Firmware Upgrade and Annual Support Service**

- Simulator license can be in-filed upgraded to higher editions.  
Value Package editions can be upgraded to Engine Basic editions (part #: LICJ1939-004).  
Engine Basic editions can be upgraded to Engine Premium editions (part #: LICJ1939-001).  
Engine Premium editions can be upgraded to Vehicle Platinum editions (part #: LICJ1939-002).  
Non-Plus” editions are able to be upgraded to plus editions (part #: LICJ1939-003).  
"Au License Management Toolset" provides the in-filed license upgrading capability.

- Firmware can be in-field updated with **Au PIC Bootloader**  
Firmware update code or customized codes can be re-programmed to gain new or special features.  
Au J1939 Simulator 1.00A can be upgraded to Au J1939 Simulator 2.00A (part #: FIRJ1939-001)  
"Au PIC Bootloader " provides the in-field firmware upgrading capability.

- Annually upgrade and support service is available at Au Group Electronics (part #: SVS-SIM-J1939).

Part numbers for license upgrading and annual service for the 8 editions of Au SAE J1939 Simulator Gen II 1.00A are summarized in Figure 1-7.

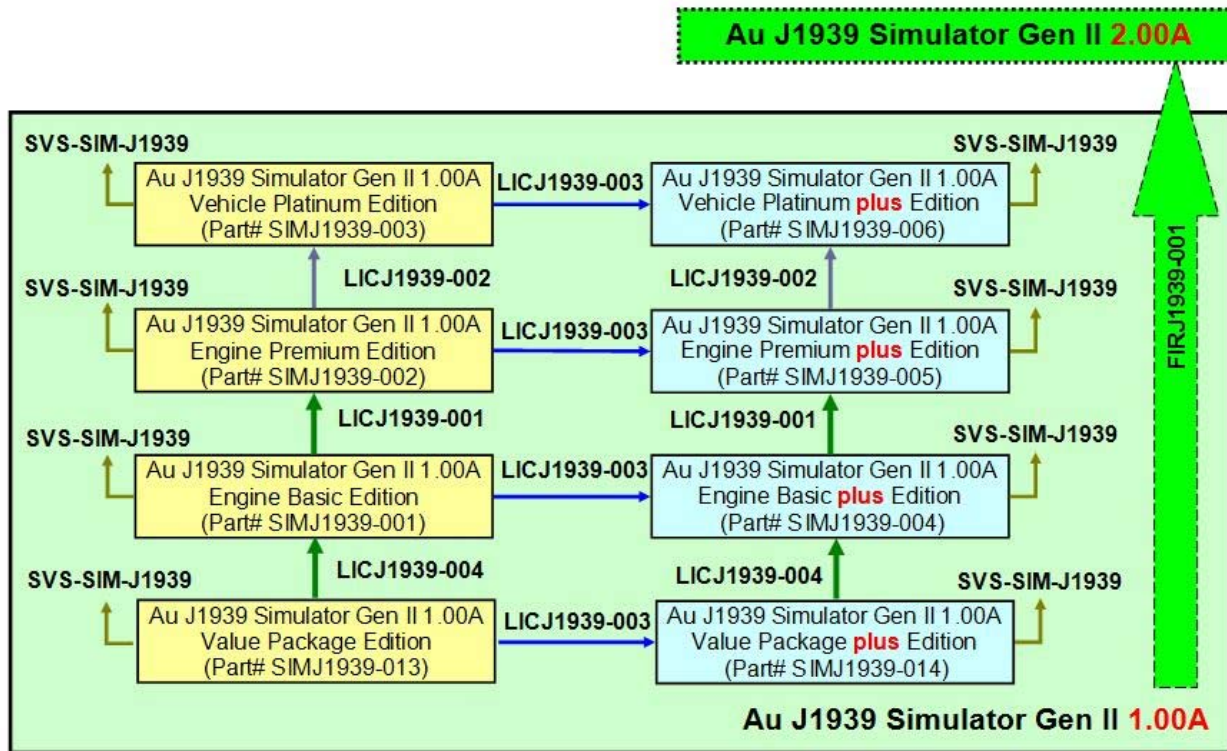


Figure 1-7 License upgrade and annual service for SAE J1939 Simulators

## Chapter 2 - Supported SAE J1939 Parameters

### 2.1. Value Package editions

Au SAE J1939 Simulator Gen II 1.00A Value Package editions supports 11 most frequently used engine parameters:

- Engine % Load at Current Speed (SPN 92)
- Engine Oil Pressure (PSI) (SPN 100)
- Engine Coolant Temperature (SPN 110)
- Engine Fuel Rate (SPN 183)
- Engine Speed (RPM) (SPN190)
- Engine Total Hours of Operation (Hr) (SPN 247) \*
- Response for Engine Hour Request (Rx)
- Engine Address Claiming
- Engine Address CANNOT Claim
- Response for Address Claim Request (Rx)
- Address Conflict Response with Contention

\* Response only with SAE J1939-21 Request PGN 59904.

### 2.2. Engine Basic editions

Au SAE J1939 Simulator Gen II 1.00A Engine Basic editions support all parameters listed with Value package editions, plus the following 20 SAE J1939 engine parameters (total 31):

- Wheel Based Vehicle Speed (MPH) (SPN 84)
- Accelerator Pedal Position 1 (SPN 91)
- SAE J1939 Fuel Level 1 (SPN 96)
- Engine Turbocharger Boost Pressure (PSI) (SPN 102)
- Engine Intake Manifold 1 Temperature (F) (SPN 105)
- Battery Potential (Voltage), Switched (SPN 158)
- Engine Instant Fuel Economy (SPN 184)
- Engine Trip Distance (SPN 244)
- Total Vehicle Distance (SPN 245)
- Cruise Light (SPN 595)
- Engine Clock (HH:MM) (SPN 961, 960)
- Response for Engine Clock Request (Rx)
- Engine Clock setup (SPN 1605, 1604) (Rx)
- SAE J1939 Acknowledge protocol (ACK, NACK)
- Engine DM1 Red Stop Lamp OFF status (SPN 623)
- Engine DM1 Amber Lamp OFF status (SPN 624)
- Engine DM1 (Health-heart-beat)\*
- **Vehicle Identification Number (VIN) (SPN 237)**
- Response for VIN global request
- Response for VIN specific request
- Water-in-Fuel Indicator (Health-heart-beat)\* (SPN 97)

\* Health-heart-beat: normal signal only, no warning, signal repeats in SAE defined “heart-beat” rate.

### 2.3. Engine Premium editions

Au SAE J1939 Simulator Engine Premium editions support all SAE J1939 parameters listed with Engine Basic editions, plus the following 12 SAE J1939 parameters and new features (total 43):

- Engine DM1 Warning On/Off control
- Engine Red Stop Lamp On/Off
- Engine Amber Lamp On/Off
- Engine DM1 Single-Packet warning
- Engine DM1 Multi-Packet warnings
- Engine DM2 Single-Packet warning
- Engine DM2 Multi-Packet warnings
- Response for DM2 global request (Rx)
- Response for DM2 specific request (Rx)
- Engine DM3 and Engine DM2 On/Reset control (Rx)
- SAE J1939 TP.CM.BAM, TP.DT protocol
- SAE J1939 TP.CM.EndOfMsgAck, TP.CM.RTS, TP.CM.CTS, TP.Conn.Abort, TP.DT protocol

### 2.4. Vehicle Platinum editions

Au SAE J1939 Simulator vehicle Platinum editions support all SAE J1939 parameters listed with Engine Premium editions, plus 18 Engine Configuration, ABS related parameters, and Transmission related parameters (total 61).

- Engine Configuration
- ABS address claim
- ABS Address CANNOT Claim
- ABS Response Request for Address Claim (Rx)
- ABS Address Conflict Response with Contention
- ABS Red Stop Lamp On/Off
- ABS Amber Lamp On/Off
- ABS DM1 (No warning or 1 warning)
- ABS Heart-beat PGN-EBC1
- Transmission address claim
- Transmission Address CANNOT Claim
- Transmission Response Request for Address Claim (Rx)
- Transmission Address Conflict Response with Contention
- Transmission Red Stop Lamp On/Off
- Transmission Amber Lamp On/Off
- Transmission DM1 (No warning or 1 warning)
- Transmission Oil Temperature
- Transmission Heart-beat PGN-ET



## Chapter 3 - Operating Instructions

All editions of Au SAE J1939 Simulator Gen II can be operated by just controlling 3 push buttons. It generates SAE J1939 signals for product developers, testers, operators and manufacturers.

### 3.1. Power On

Plug in a 4-wire cable (e.g. Au Part#: CBL-CAN-01) to Au SAE J1939 Simulator Gen II **BUS** side DB9 male connector (pin-out of BUS side male connector is illustrated in Figure 1 - 2). When the CBL-CAN-01 cable is used, connect the **Red** wire to +12V DC power supply, **Black** wire to ground, **White** wire to CAN-H, **Green** wire to CAN-L. The **Power** LED on simulator will light up, and simulator will resume the last saved operating mode (static mode or dynamic mode).

### 3.2. Operating Mode (Static/Dynamic)

After power on, Au SAE J1939 Simulator will work on either **static** mode or **dynamic** mode.

- **Static mode:** Au SAE J1939 Simulator Gen II generates steady SAE J1939 signals. In this mode, two push buttons (**Up** and **Down**) can be used to change the data outputs. When no button is pushed, all data will stay at the last value.
- **Dynamic mode:** The value of all data will change automatically in SAE J1939 defined range
- Switch between dynamic mode and static mode: Press and hold both **Menu** and **Up** buttons until a long beep is heard if buzzer is enabled; or both the "▼0% LED" and "▲100% LED" flip their status (from on to off or vice versa)

Au SAE J1939 Simulator Gen II equipped with 3 push buttons (**Menu**, **Down**, **Up**) and 9 LEDs (Figure 3-1). Each LED is named after its function.

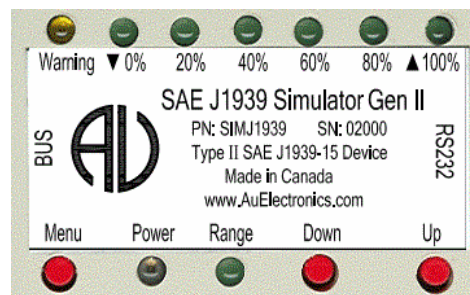


Figure 3-1 Position of push buttons and LEDs

### 3.3. Push Button Function

- Press **Menu** button:
  - **Menu** button is used to control **Warning** LED on/off. A single press on **Menu** button will turn on the **Warning** LED if the Warning LED was off, and vice versa.
  - The **Menu** button function is available **only** on Engine Premium editions and Vehicle Platinum editions. In Value Package editions and Engine Basic editions, Menu button is not used. Warning LED is constant off.
  - If buzzer is enabled, a short beep will be heard upon a press on the **Menu** button.

In dynamic mode, the simulator automatically adjusts the control step value by itself. This will generate dynamic J1939 signals. In static mode, all\* simulated SAE J1939 signal will be controlled by the control step value, which is still able to be manually controlled by the **Up** and **Down** buttons.

**Note:** \* The Engine Clock is not controlled by the control step value and push buttons; it runs all by itself just like a real clock.

- Press **Down** button:
  - **Down** button is used to decrease the values of all J1939 signals. A single press will decrease all data one step from previous values until they reach the minimum values. ▼0% LED will be triggered on/off.
  - If ▼0% LED is on, press **Down** button one time, ▼0% LED will be off.
  - If ▼0% LED is off, press **Down** button one time, ▼0% LED will be on.
  - 80% LED blinks when control step value equals to 80%,
  - 60% LED blinks when control step value equals to 60%,
  - 40% LED blinks when control step value equals to 40%,
  - 20% LED blinks when control step value equals to 20%,
  - ▼0% LED blinks when control step equals to 0%,
  - If buzzer is enabled, a short beep will be heard upon a press on **Down** button.

- Press **Up** button:
  - **Up** button is used to increase the values of all J1939 signal. A single press will increase all simulated data one step to next data level until they reach the maximum values, ▲ 100% LED will be triggered on or off.
  - If ▲ 100% LED is on, press **Up** button one time, ▲ 100% LED will be off.
  - If ▲ 100% LED is off, press **Up** button one time, ▲ 100% LED will be on.
  - 20% LED blinks when control step value equals to 20%,
  - 40% LED blinks when control step value equals to 40%,
  - 60% LED blinks when control step value equals to 60%,
  - 80% LED blinks when control step value equals to 80%,
  - ▲ 100% LED blinks when control step value equals to the highest value, 100%.
  - If buzzer enabled, a short beep will be heard upon a press on **Up** button.
- Press and hold both **Down + Up** button for more than 1 second:
  - **Down + Up** buttons are used to turn buzzer on/off.
  - If buzzer is on, press and hold **Down + Up** for more than 1 second will silent buzzer thereafter.
  - If buzzer is mute, press and hold **Down + Up** for more than 1 second will enable the buzzer thereafter.
  - Both ▲ 100% and ▼ 0% LED will flip their on/off status as a visual indication of this dual-button input.
  - If buzzer is enabled, a long beep will be heard to reflect the input of **Down + Up** button.
- Press and hold both **Menu + Down** button for more than 1 second:
  - **Menu + Down** buttons are used to turn Engine DM2 warning on/Reset.
  - Both ▲ 100% LED and ▼ 0% LED will flip their status as a visual indication of this dual-button input.
  - If buzzer is enabled, a long beep will be heard to reflect the input of **Menu + Down** button.
  - The Engine DM2 warning messages (on premium and platinum editions) are always on after power-on. It can be reset when an Engine DM3 PGN is received.
  - For continuous test purpose, after an Engine DM3 PGN is received, either re-power-on the simulator or press and hold both **Menu + Down** button for more than 1 second will turn on the Engine DM2 warning again.
- Press and hold both **Menu + Up** button:
  - **Menu + Up** buttons are used to switch between static mode and dynamic mode.
  - Both ▲ 100% LED and ▼ 0% LED will flip their status as a visual indication of this dual-button input.
  - If buzzer enabled, a long beep will be heard to reflect the input of **Menu + Up** button.

The push button functions are summarized in Table 3-1.

Table 3-1 Summary of Push button functions

Push Button Operation	Function
Press <b>Down</b> button	Decrease all simulated data until they reach the lowest value
Press <b>Up</b> button	Increase all simulated data until they reach the highest value
Press <b>Menu</b> button	DM1 Warning On/Off control (N/A for Value Package and Engine Basic editions)
Press and hold <b>Menu</b> button when power on	Simulator will enter <b>Bootloader</b> mode, if no communication is detected from a PC Bootloader program within 10 seconds, it'll resume normal modes
Press and hold both <b>Down + Up</b> button	Buzzer ON/OFF control
Press and hold both <b>Menu + Up</b> button	Switch between Static/Dynamic mode
Press and hold both <b>Menu + Down</b> button	Engine DM2 ON/Reset control (N/A for Value Package and Engine Basic editions)

### 3.4. LED Indicator Status

**Note:** Red LEDs and Green LEDs are used in this document for illustration purpose; actual product might have different LED color. Same applies to the push buttons. Au Group Electronics reserve the right of changing the color on each LEDs and push buttons without further notification.

- When power on, both **Power** LED and **Range** LED lit, as shown in Figure 3-2.

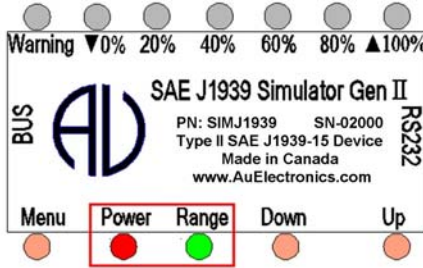


Figure 3-2 Power on, both Power and Range LED lit

All SAE J1939 data can be changed within the SAE defined range from 0 to 100 control steps (named 0% to 100% control step value from now on), 6 LEDs are used to identify the control step value in the range of 0%, 20%, 40%, 60%, 80%, and 100%.

- ▲100% LED will be on or off with a press on the **Up** button, accompany with the increasing brightness of **Range** LED. A press on the **Up** button will also increase the control step value and all simulated data.
  - When control step value equals to 0%, the ▼0% LED blinks.
  - When control step value equals to 20%, 20% LED blinks.
  - If keep pressing **Up** button, the control step value will keep increasing. The 20% LED will then be always on, as shown in Figure 3-3. This indicates a data range from 21- 39%.

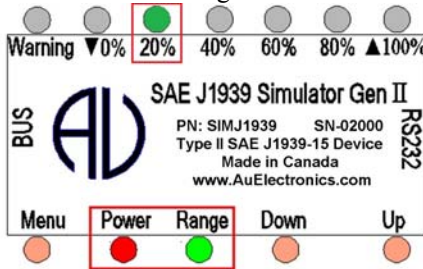


Figure 3-3 Power, Range, 20% LED on, indicates data ranges from 21% to 39%

- When control step value equals to 40%, 40% LED blinks.
- If keep pressing **Up** button, the control step value will keep rising, 20% and 40% LED will be always on, as shown in Figure 3-4. It indicates the data range from 41% to 59%.

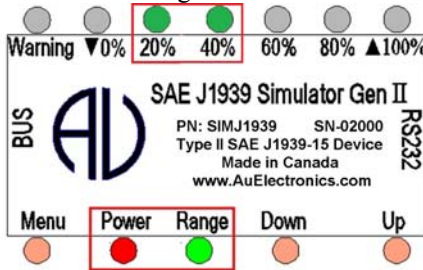


Figure 3-4 Power, Range, 20%, 40% LED on, indicates data ranges from 41% to 59%

- When control step value equals to 60%, 60% LED blinks
- If keep pressing **Up** button, the control step value will keep rising, the 20%, 40%, and 60% LED will be on, as shown in Figure 3-5, it indicates the data range from 61% to 79%.

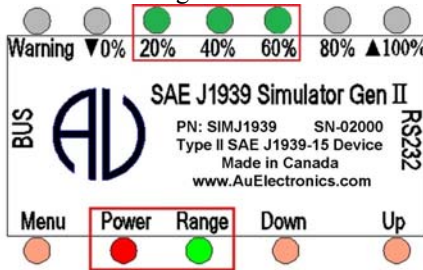


Figure 3-5 Power, Range, 20%, 40%, 60% LED on, indicates data ranges from 61% to 79%

- When control step value equals to 80%, 80% LED blinks.
- If keep pressing **Up** button, the control step value will keep rising, 20%, 40%, 60%, and 80% LED will be on, as shown in Figure 3-6, it indicates the data range from 81% to 99%.

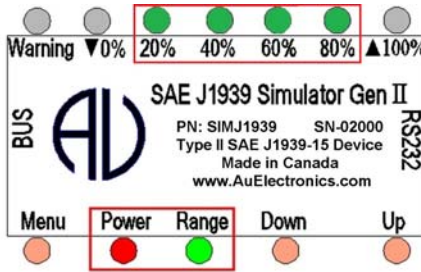


Figure 3-6 Power, Range, 20%, 40%, 60%, 80% LED on, indicates data ranges from 81% to 99%

- When control step value equals to 100%, 20%, 40%, 60%, and 80% LED will be constant on. ▲100% LED blinks, as shown in Figure 3-7.

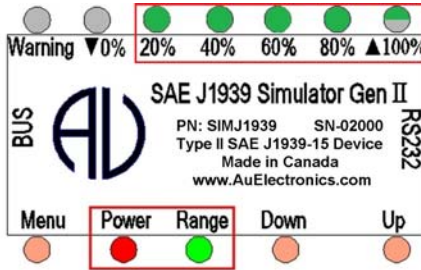


Figure 3-7 Power, Range, 20%, 40%, 60%, 80% are constant on, “▲100%” LED blinks, indicating data reaches 100%

- ▼0% LED will be on or off when pressing **Down** button, accompany with the decreasing brightness of Range LED. A press on the **Down** button will also decrease the control step value and all simulated data. When the control step value equals to 0%, ▼0% LED blinks.

The control step value LED indicator status is summarized in Table 3-2.

Table 3-2 Control step value vs. LED indicator status (in Static Mode)

Operation	LED Status
Step 1. Connect +12 V DC power supply	<b>Power, Range</b> LED on, the rest LED will recall the last saved status in Static mode
Step 2. Press <b>Down</b> button	▼0% LED on/off
Step 3. Continue press <b>Down</b> button until the control step value equals to 0%	▼0% LED blink
Step 4. Press <b>Up</b> button	▲100% LED on/off
Step 5. Continue press <b>Up</b> button for control step value 1 to 19%	<b>Power, Range</b> LED constant on
Step 6. Continue press <b>Up</b> button for control step value 20%	<b>Power, Range</b> LED on, 20% LED Blink
Step 7. Continue press <b>Up</b> button for control step value 21 to 39%	<b>Power, Range</b> LED on, 20% LED on
Step 8. Continue press <b>Up</b> button for control step value 40%	<b>Power, Range, 20% LED ON, 40% LED Blink</b>
Step 9. Continue press <b>Up</b> button for control step value 41 to 59%	<b>Power, Range, 20%, 40% LED on</b>
Step 10. Continue press <b>Up</b> button for control step value 60%	<b>Power, Range, 20%, 40% LED on, 60% LED blink</b>
Step 11. Continue press <b>Up</b> button for control step value 61 to 79%	<b>Power, Range, 20%, 40%, 60% LED on</b>
Step 12. Continue press <b>Up</b> button for control step value 80%	<b>Power, Range, 20%,40%, 60% LED on, 80% LED blink</b>
Step 13. Continue press <b>Up</b> button for control step value 81 to 99%	<b>Power, Range, 20%, 40%, 60%, 80% LED on</b>
Step 14. Continue press <b>Up</b> button for control step value 100%	<b>Power, Range, 20%, 40%, 60%, 80% LED on, ▲100% blink</b>



## Chapter 4 - Au J1939 Simulator Remote Terminal GUI

For all Au SAE J1939 Simulator Gen II 1.00A “Plus” editions, the “Au J1939 Simulator Remote Terminal Ver. 1.00A” GUI can be used to control and display simulated SAE J1939 signals on PC screen.

The Remote Terminal GUI (Graphic User Interface) includes a control panel and a display panel. Control panel is located in the up-left corner. All the other area is used for displaying information like engine/ABS/Transmission info, warning lamp, etc. as shown in Figure 4-1, 4-3, 4-4.

Figure 4 -1 shows Remote Terminal GUI for Au SAE J1939 Simulator Gen II 1.00A **vehicle platinum plus** edition. All features are active.



Figure 4-1 Au J1939 Simulator Remote Terminal GUI – Gen II 1.00A Vehicle Platinum Plus Edition

Au J1939 Simulator Remote Terminal Structure is summarized in Figure 4-2.

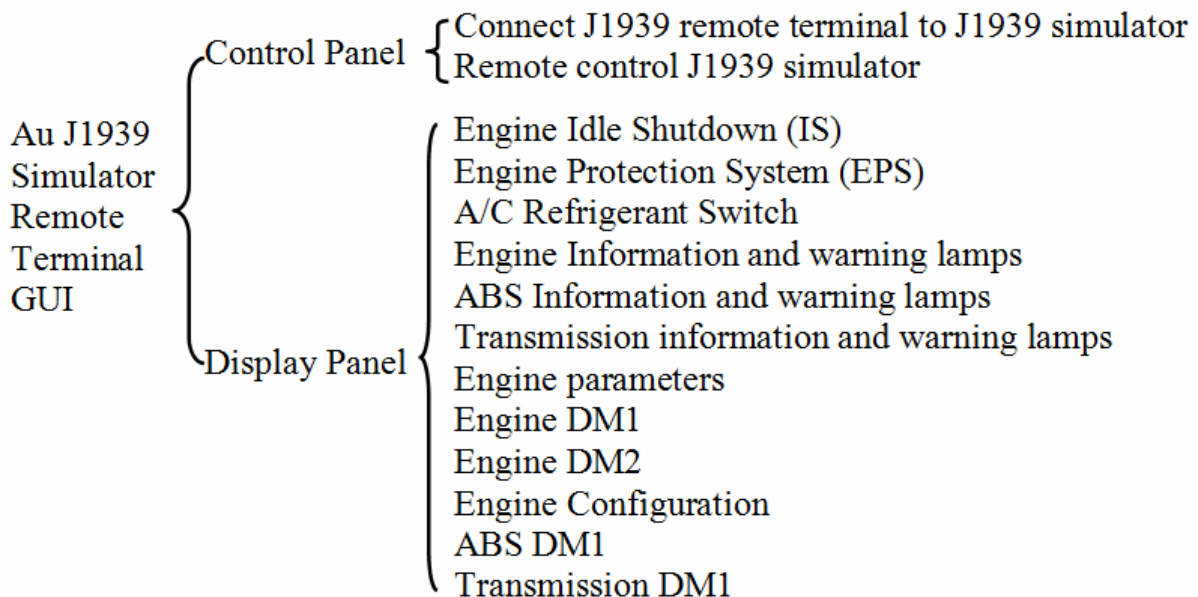


Figure 4-2 Au J1939 Simulator Remote Terminal Structure

Figure 4 -3 shows the Remote Terminal GUI for Au SAE J1939 Simulator Gen II 1.00A **Engine Premium Plus** edition. Engine info and warning lamps, engine basic parameters, Engine DM1, and Engine DM2 are included.

ABS info, Transmission info and engine configuration are **NOT** available.



Figure 4-3 SIMJ1939 1.00A GUI –Engine Premium Plus Edition

Figure 4 -4 shows the Remote Terminal GUI for Gen II 1.00A **Engine Basic Plus** edition.

Engine information, cruise lamps, and engine basic parameters are active.

ABS info, Transmission info, engine DM1, engine DM2, and engine configuration are **NOT** available.



Figure 4-4 SIMJ1939 GUI - Engine Basic Plus Edition

Figure 4 - 5 shows the Remote Terminal GUI for Au SAE J1939 Simulator Gen II 1.00A Value Package Plus edition, 6 most frequently used Engine Parameters are available:

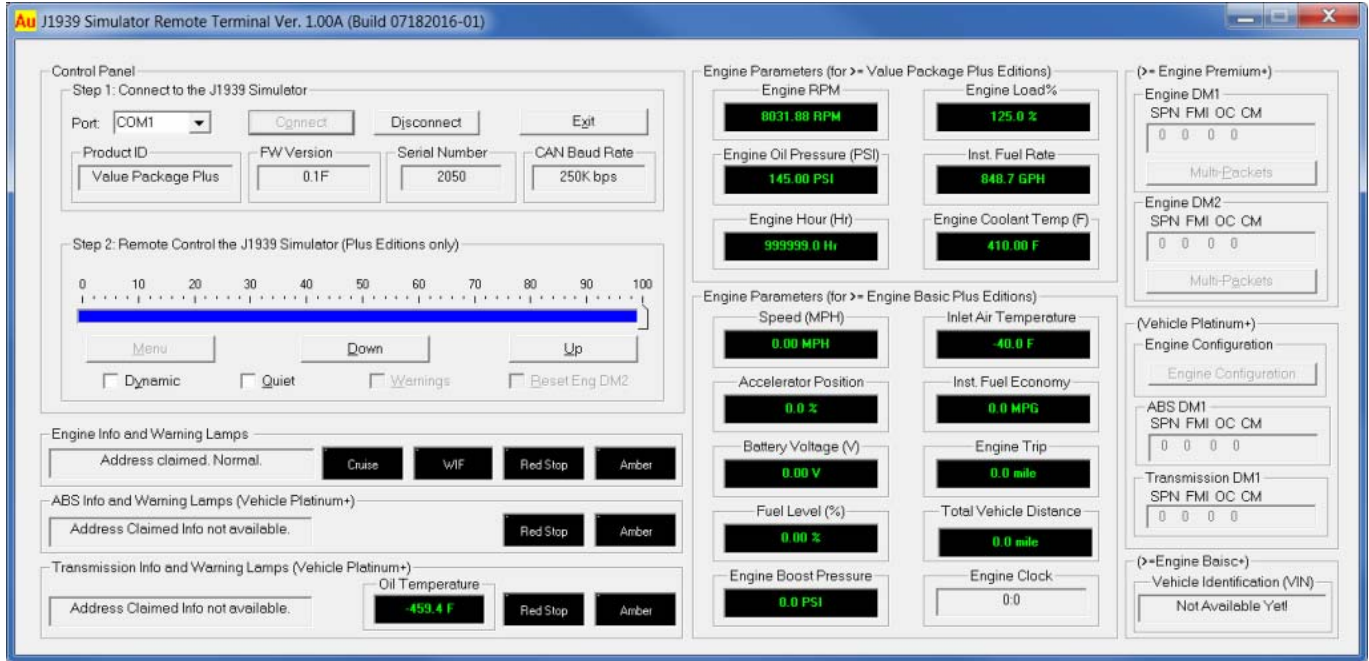


Figure 4-5 SIMJ1939 GUI - Value Package Plus Edition

Following paragraphs will explain how to use the GUI to remote control Au SAE J1939 Simulator Gen II 1.00A **Plus** editions.

### 4.1. Control Panel – Step 1: Connect to J1939 Simulator

Connect the simulator to power supply and a CAN network, and then connect it to PC serial port.

Select serial port from the “Port” drop down list → click “Connect” button → messages about the connected J1939 simulator edition (Product ID, FW version, Serial Number, CAN Baud Rate) will display, as shown in Figure 4-6.

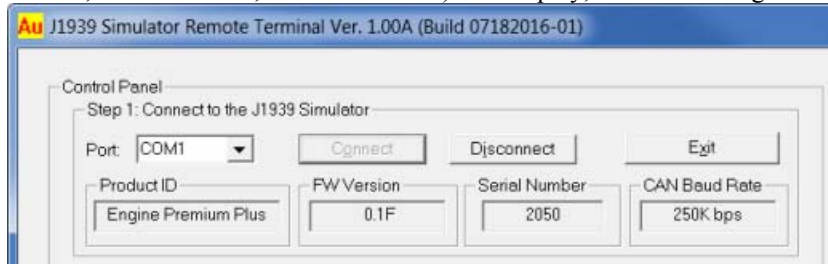


Figure 4-6 SIMJ1939 GUI control panel step 1 - Connect to J1939 Simulator

**Note:** The control panel step 1 can always be used to display Product ID, Simulator Version, Product Serial Number, and CAN Baud Rate for all Au J1939 simulator editions (both **plus** edition and **non-plus** edition).

The function of step 1 control items is summarized in Table 4-1

Table 4-1 Function summary of step 1 control items

Items	Function
Port	Serial port can be selected from drop down list (COM1 to COM30)
Connect	Click “Connect” button to connect J1939 simulator with selected PC serial port.
Disconnect	Click “Disconnect” button to release the selected PC serial port.
Exit	Click “Exit” button to close the J1939 remote terminal program
Product ID	Display the current edition of J1939 simulator that’s hooked up with the serial port. (The demonstration in Figure 4-6 is a Vehicle Platinum Plus Edition)
Simulator Version	Display the current version of J1939 simulator that’s hooked up with the serial port. (The demonstrated version of the connected simulator in Figure 4-6 is 0.1B)
Product Serial Number	Display the serial number of J1939 simulator that’s connected to the serial port. (The demonstrated serial number for the connected simulator in Figure 4-6 is 2000)
CAN Baud Rate	CAN Baud Rate of J1939 simulator, can be configured to : 62.5K, 125K, 250K, 500K, 1M bps Please refer to the appendix B for detail information on how to configure CAN Baud Rate.

### 4.2. Control Panel – Step 2: Remote control the J1939 Simulator

Remote control includes 1 scale bar, 3 push buttons (**Menu**, **Down**, **Up**), and 4 check boxes (**Dynamic**, **Quite**, **Warnings**, **Reset Eng DM2**), as shown in Figure 4-7. These tools are able to remote control the output/simulated signal of the Au J1939 Simulator **PLUS** editions.

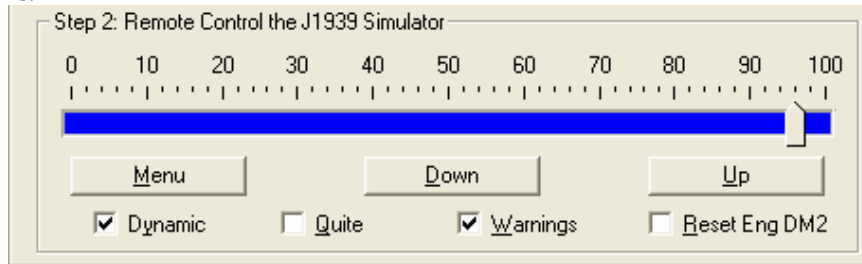


Figure 4 - 7 SIMJ1939 GUI control panel step 2 – Remote control the J1939 Simulator

The scale bar represents the control step values from 0% to 100%. The sliding action can be made by 3 methods: keyboard, mouse or Down/Up buttons from remote terminal. They are summarized in Table 4-2

Table 4-2 Control Methods for Scale Bar

	Action	Function
Mouse	Left Click	Left click bring the slide to the desire location
	Drag	Click and hold left button drag the slide to desire location
Keyboard	▲ or ►	Increase the scale range in 1 interval
	▼ or ◀	Decrease the scale range in 1 interval
	Pg Up	Increase the scale range in 10 interval
	Pg Dn	Decrease the scale range in 10 interval
Remote terminal	Down button	Decrease the scale range in 1 interval
	Up button	Increase the scale range in 1 interval

The function for the 3 push buttons and 4 check boxes is listed in Table 4-3.

Table 4-3 Functions for push button and check boxes in step 2

	Tool	Function
Button	Menu	Turn on/off warning (see <b>note</b> below)
	Down	Decrease the control step value in 1
	Up	Increase the control step value in 1
Check box	Dynamic	Switch between dynamic mode / static mode
	Quite	Turn on/off buzzer
	Warning	Turn on/off Eng/ABS/Trans DM1 warnings
	Reset Eng DM2	Turn on/reset all Engine DM2 code

**Note:** Menu button is active only in the **Engine Premium Plus** edition and **Vehicle Platinum Plus** edition.

### 4.3. Display Panel – Engine info and Warning Lamps

It displays the engine address claiming information, 1 information lamp (Cruise lamp), and 3 warning lamps for engine (WIF - water in fuel, Red Stop, Amber), as shown in Figure 4-8. The warning lamps will turn on/off based on the scale range, see Table 4-4 to Table 4-7 for more information.



Figure 4-8 Display Engine info and warning lamps

### 4.4. Display Panel – ABS info and Warning Lamps

It displays the ABS address claiming information and 2 warning lamps for ABS (Red Stop, Amber) (Figure 4-9).



Figure 4-9 Display ABS info and warning lamps



### 4.5. Display Panel – Transmission info and Warning Lamps

It displays the transmission address claiming information, transmission oil temperature, and 2 warning lamps for transmission (Red Stop, Amber), as shown in Figure 4-10.



Figure 4-10 Display transmission info and warning lamps

### 4.6. Display Panel – Value Package Parameters

SIMJ1939 1.00A Value Package plus edition display the following 6 most frequently used engine parameters, as shown in figure 4-11.

- Engine Speed(RPM)
- Engine oil pressure (PSI)
- Engine hour (Hr)
- Engine load percentage (%)
- instant fuel economy (MPG)
- Engine coolant temperature

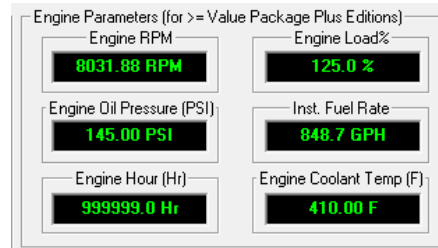


Figure 4-11 SIMJ1939 1.00A Engine basic parameters

### 4.7. Display Panel – Engine Basic Parameters

SIMJ1939 1.00A Engine Basic plus edition display the following 17 engine parameters, as shown in figure 4-12:

- Engine Speed(RPM)
- Engine oil pressure (PSI)
- Engine hour (Hr)
- Engine load percentage (%)
- Instant fuel rate (GPH)
- Engine coolant temperature (F)
- Vehicle speed (MPH)
- Accelerator position (%)
- Battery voltage (V)
- Fuel level (%)
- Engine boost pressure (PSI)
- Inlet air temperature (F)
- Instant fuel economy (MPG)
- Engine trip (mile)
- Total vehicle distance (mile)
- Engine clock (HH:MM)
- Vehicle Identification Number (VIN)



Figure 4-12 SIMJ1939 1.00A Engine basic parameters

**Note:** Engine Clock is not controlled by the control step value, it runs by itself like a real clock, and can be setup by PGN 54528.

### 4.8. Display Panel – Engine DM1

Engine DM1 message could be **single packet** (without warning or with 1 warning) or **multi-packet**.

When engine DM1 is a single packet message, SPN, FMI, OC, CM will display (Figure 4-13).

when engine DM1 is a multi-packet message, “see @ Multi-Packets” will display, “Multi-packets” button will be active (Figure 4-14), click on it, the whole list of engine DM1 will display (Figure 4-15).

If Engine DM1 or DM2 warning is off, a SAE defined non-warning message will be shown as (0,0,0,0).

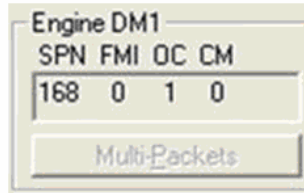


Figure 4-13 Engine DM1 single packet, showing SPN, FMI, OC, CM, and "Multi-Packets" button is non-active

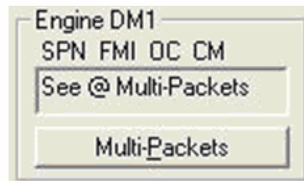
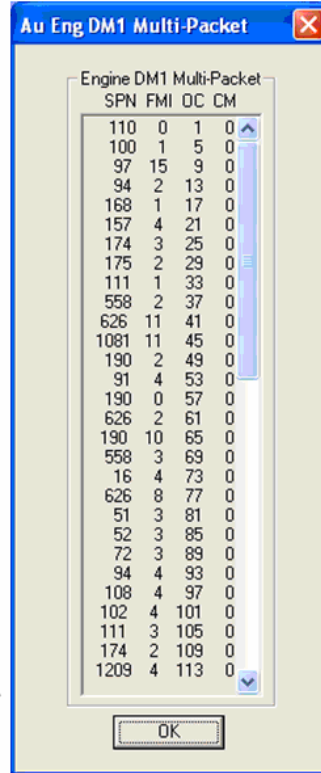


Figure 4-14 Engine DM1 Multi-packets, showing See @ Multi-Packets, and "Multi-Packets" button is active

Figure 4-15 Click on "Multi-Packets" button, the whole list of engine DM1 code will display



Detail data information of engine DM1 multi-packet is showing in Table 4 – 4 to 4 – 7.

Table 4 – 4 Engine DM1 Multi-Packets (1 – 16)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>SPN</b>	110	100	97	94	168	157	174	175	111	558	626	1081	190	91	190	626
<b>FMI</b>	0	1	15	2	1	4	3	2	1	2	11	11	2	4	0	2
<b>OC</b>	1	5	9	13	17	21	25	29	33	37	41	45	49	53	57	61
<b>CM</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 4 – 5 Engine DM1 Multi-packets (17 – 32)

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
<b>SPN</b>	190	558	16	626	51	52	72	94	108	102	111	174	1209	2791	176	175
<b>FMI</b>	10	3	4	8	3	3	3	4	4	4	3	2	4	3	2	3
<b>OC</b>	65	69	73	77	81	85	89	93	97	101	105	109	113	117	121	125
<b>CM</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 4 – 6 Engine DM1 Multi-Packets (33 – 48)

	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
<b>SPN</b>	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102
<b>FMI</b>	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>OC</b>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<b>CM</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 4 – 7 Engine DM1 Multi-Packets (49 – 64)

	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64
<b>SPN</b>	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102	102
<b>FMI</b>	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
<b>OC</b>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
<b>CM</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

### 4.9. Display Panel – Engine DM2

Engine DM2 message could be a **single packet** or **multi-packet**.

If engine DM2 is a single packet, SPN, FMI, OC, CM will display (Figure 4-16).

If engine DM2 is a multi-packet, “see @ Multi-Packets” will display, “Multi-packets” button will be active (Figure 4-17), Click on it, the whole list of engine DM2 will display (Figure 4-18).

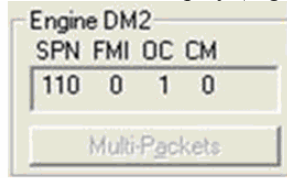


Figure 4-16 engine DM2 is a single packet, showing SPN, FMI, OC, CM, "Multi-Packets" button is non-active

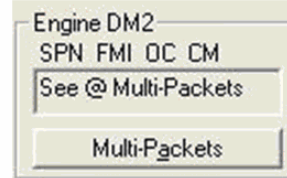


Figure 4-17 engine DM2 multi-packets, showing "See@ Multi-Packets", "Multi-Packets" button is active

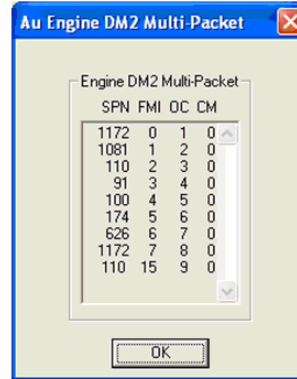
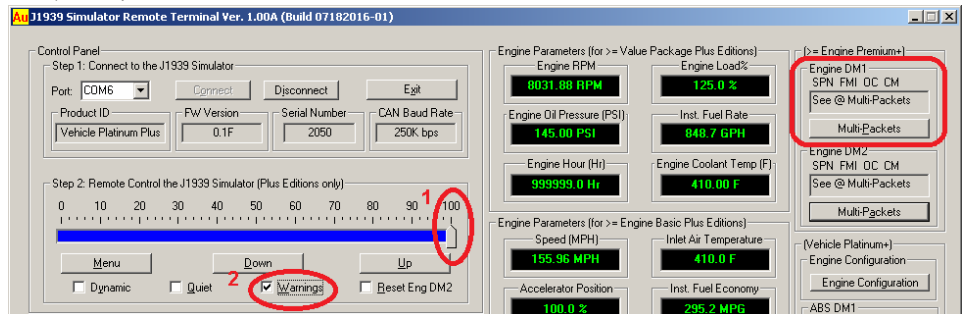


Figure 4-18 Click on "Multi-packets" button, the whole list of engine DM2 code display

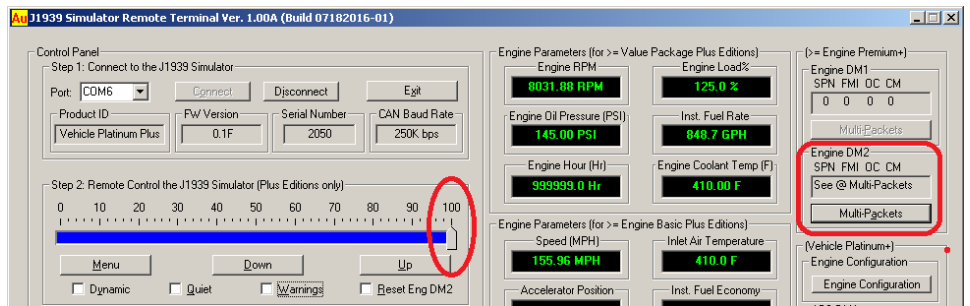
**\*Note:** The "Multi-Packets" buttons are used as a trigger for a pop-up sub-window which will display all DM1/DM2 code. It is not used to turn on/off Multi-Packets DM1/DM2.

**Engine DM1 Multi-Packets** will be available when both of the following two conditions are met

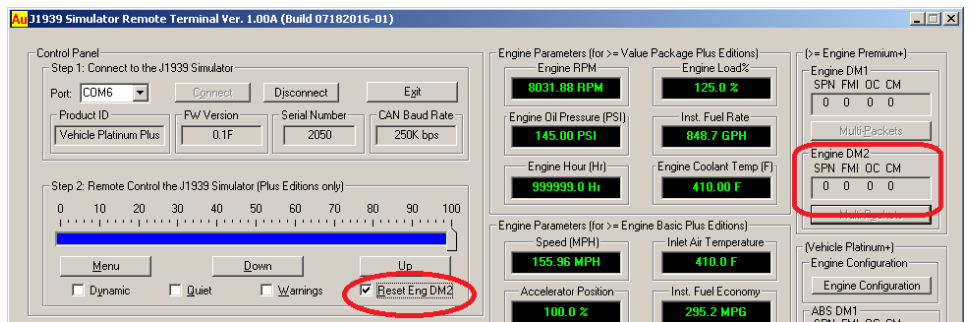
- **Warning is on**
- **Control step value is 100**



**Engine DM2 Multi-Packets** will be available when:  
**Control step = 100.**



When "Reset Eng DM2" is checked, Engine DM2 will be reset to 0.



### 4.10. Display Panel – Engine Configuration

Engine Configuration PGN includes 39 bytes of messages, which require transport protocol for multi-packet communication.

“Engine Configuration” button will be active on the remote terminal GUI for Vehicle Platinum editions, as shown in Figure 4 - 19.

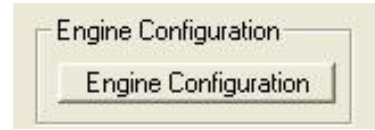


Figure 4-19 Engine Configuration

Click on "Engine Configuration" button, detail information will show up, as shown in Figure 4-20.

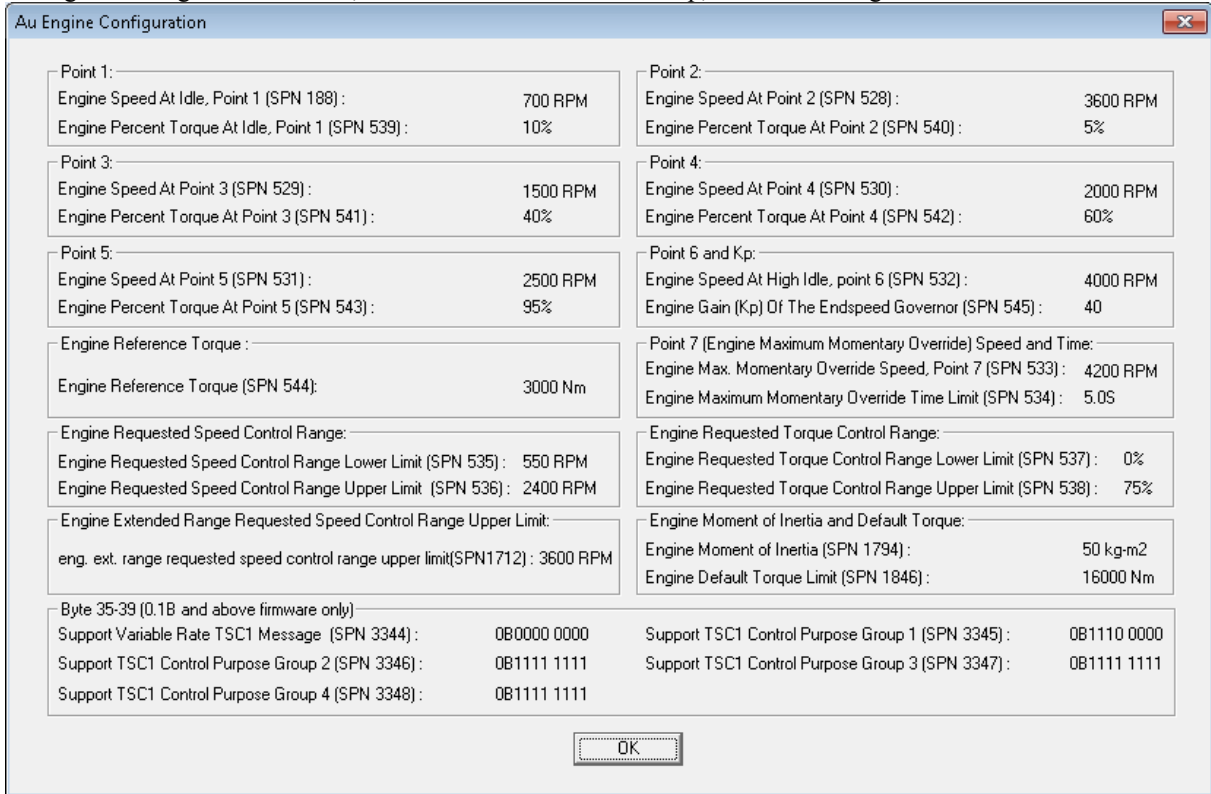


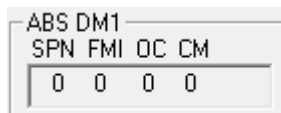
Figure 4-20 Display panel – Engine Configuration

### 4.11. Display Panel – ABS DM1

ABS DM1 is a single-packet PGN.

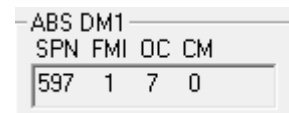
**ABS warning is OFF**

SAE defined non-warning message will show as (0,0,0,0)



**ABS warning is ON**

a Brake Switch signal low warning will show as (597,1,7,0)

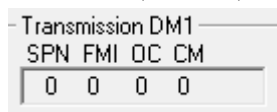


### 4.12. Display Panel – Transmission DM1

Transmission DM1 is a single-packet PGN.

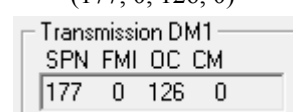
**Transmission warning is OFF**

SAE defined non-warning message will show as (0, 0, 0, 0)



**Transmission warning is ON,**

a transmission warning will show as (177, 0, 126, 0)





## Chapter 5 - Data Configuration

Table 5-1 listed simulated result at control step value of 0%, 20%, 40%, 60%, 80%, and 100%.

J1939 Parameters	0%	20%	40%	60%	80%	100%
RPM (rpm)	0	1606.38	3212.75	4819.13	6425.5	8031.88
Engine Hour (Hr)	0	250	500	750	1000	999999
Engine Oil Pressure (PSI)	0	29	58	87	116	145
Engine Coolant Temp (F)	-40	50	140	230	320	410
Engine Load % (%)	0	25	50	75	100	125
Instant Fuel Economy (MPG)	0	22.5	45	67.5	90	295.2
Battery Voltage (V)	0	7.5	15	22.5	30	3212.75
Fuel Level (%)	0	20	40	60	80	100
Vehicle Speed (MPH)	0	31.19	62.38	93.58	124.77	155.96
Total Vehicle Distance (mile)	0	621.4	1242.7	1864.1	2485.5	621372
Engine Boost Pressure (PSI)	0	14.5	29	43.5	58	72.5
Instant Fuel Rate (GPH)	0	15	30	45	60	848.7
Accelerator Position (%)	0	20	40	60	80	100
Inlet Air Temp (F)	-40	32	104	176	248	410
Engine Trip (mile)	0	310.7	621.4	932.1	1242.7	621372
Transmission Oil Temp (F)	-459	-40	104	248	392	3154.9
Vehicle Identification (VIN)	0*	~020*	~030*	~060*	~080*	*100*

NOTE:

1. Engine Clock is a self-running clock parameter, it will automatically change every minute.
2. Transmission oil temp is only available for Vehicle Platinum editions.
3. The first 14 digital bit of VIN number is "1M8GDM9AXKP042\*\*\*", the last 3-bit changes from 000 to 100

For Engine Premium editions and Vehicle Platinum editions,

When warning is turned on, change the control step value will generate different warnings signal. The warning information will also be displayed on the remote terminal GUI. The specific warning message, SPN, and FMI are listed in Table 5-2 for reference.

Table 5-2 SAE J1939 Warning simulation result vs. controlled Steps

Control Step	Warning Lamps	Warning message	SPN	FMI
0%	Engine Amber	Low engine coolant level	111	1
1 - 9%	Engine Amber	Low battery electrical potential	168	1
10 - 19%	Engine (Amber + Red Stop)	Low battery electrical potential	168	1
20%	Engine (Amber + WIF)	Water in Fuel	97	15
21 - 29%	Engine Amber	Low engine oil pressure	100	1
30 - 39%	Engine (Amber + Red Stop)	Low engine oil pressure	100	1
40%	Engine Amber	High battery electrical potential	168	0
41 - 49%	Engine Amber	High engine coolant temperature	110	0
50 - 59%	Engine (Amber + Red Stop)	High engine coolant temperature	110	0
60%	Engine Amber	High engine oil pressure	100	0
61 - 69%	ABS Amber	Brake switch short	597	1
70 - 80%	ABS (Amber + Red Stop)	Brake switch short	597	1
81 - 89%	Transmission Amber	Transmission oil temperature high	177	0
90 - 99%	Transmission (Amber + Red Stop)	Transmission oil temperature high	177	0
100%	Engine (WIF +Red Stop + Amber) + ABS (Red Stop + Amber) +Transmission (Red Stop + Amber)	Engine DM1, DM2 multi-packets, ABS DM1 on, Transmission DM1 on		

When warning is turned off, all Engine/ABS/Transmission DM1 warning will be off.

Au SAE J1939 simulator supported PGN, PGN Description, and parameters (SPN) are listed in Table 5-3.

Table 5-3 List of Supported PGN and function

PGN	Description	Parameters (SPN)
54528	Time/Date Adjust (TDA)	Adjust minutes (1604), Adjust hours (1605)
59392	Acknowledgment	Positive Acknowledgment (ACK), Negative Acknowledgment (NACK)
59904	Request	Parameter Group Number (PGN) being requested
60160	Transport Protocol-Data Transfer (TP.DT)	Sequence Number, Packetized Data
60416	Transport Protocol-Connection Management (TP.CM)	Connection Mode Request to Send (TP.CM_RTS) Connection Mode Clear to Send (TP.CM_CTS) End of Message Acknowledgment (TP.CM_EndOfMsgACK) Connection Abort (TP.Conn_Abort) Broadcast Announce Message (TP.CM_BAM)
60928	Address Claimed Message	N.A
61441	Electronic Brake Controller 1 (EBC1)	EBS Red Warning Signal(1439) ABS/EBS Amber Warning Signal (Powered Vehicle) (1438)
61442	Electronic Transmission Controller 1 (ETC1)	Source Address of Controlling Device for Transmission Control (1482)
61443	Electronic Engine Controller 2 (EEC2)	Accelerator Pedal Position 1 (91) Engine Percent Load At Current Speed (92)
61444	Electronic Engine Controller 1 (EEC1)	Engine Speed (190)
65226	Active Diagnostic Trouble Codes (DTC) (DM1)	Red Stop Lamp, Amber Warning Lamp Status, Miscellaneous
65227	Previously Active Diagnostic Trouble Codes (DM2)	Red Stop Lamp, Amber Warning Lamp Status, Miscellaneous
65228	Diagnostic data clear/reset of previously active DTCS (DM3)	On request using PGN 59904, See SAE J1939-21
65248	Vehicle Distance (VD)	Trip Distance (244) Total Vehicle Distance (245)
65251	Engine Configuration (EC)	188, 539, 528, 540, 529, 541, 530, 542, 531, 543, 532, 545, 544, 533, 534, 535, 536, 537, 538, 1712
65253	Engine Hours, Revolutions (HOURS)	Engine Total Hours of Operation (247)
65254	Time/Date (TD)	Minutes (960), Hours (961)
65260	Vehicle Identification (VI)	Vehicle Identification Number (237)
65262	Engine Temperature 1(ET1)	Engine Coolant Temperature (110)
65263	Engine Fluid Level/Pressure 1(EFL/P1)	Engine Oil Pressure (100)
65265	Cruise Control/Vehicle Speed (CCVS)	Wheel-Based Vehicle Speed (84), Cruise Control Active (595)
65266	Fuel Economy (Liquid) (LFE)	Engine Fuel Rate (183), Engine Instantaneous Fuel Economy (184)
65270	Inlet/Exhaust Conditions 1(IC1)	Engine Turbocharger Boost Pressure (102) Engine Intake Manifold 1 Temperature (105)
65271	Vehicle Electrical Power (VEP)	Electrical Potential (Voltage) (168), Battery Potential (Voltage) Switched (158)
65272	Transmission Fluids (TF)	Transmission Oil Temperature (177)
65276	Dash Display (DD)	Fuel Level (96)
65279	Water in Fuel Indicator (WFI)	Water In Fuel Indicator (97)

As defined by SAE J1939-21, Au SAE J1939 simulator response to different “engine DM2 request” with different transport protocols (illustrated in Table 5-4).

Table 5 - 4 Transport Protocol for DM2 global/specific request

Request	Transport Protocol
Global request	TP.CM.BAM
	TP.DT
Specific request	TP.CM.RTS
	TP.CM.CTS
	TP.DT
	TP.CM.EndofMessage
	TP.CM.Abort

The simulation result vs. control step value (from 0 to 100) is illustrated in Table 5-5 to Table 5-14.

Table 5 – 5 SAE J1939 Simulation result vs. control step values (from 1 to 10)

Control Step	0	1	2	3	4	5	6	7	8	9	10
RPM (rpm)	0.00	80.25	160.63	240.88	321.25	401.50	481.88	562.13	642.50	722.75	803.13
Engine Hour (Hr)	0.0	12.5	25.0	37.5	50.0	62.5	75.0	87.5	100.0	112.5	125.0
Engine Oil Pressure (PSI)	0.00	1.16	2.90	4.06	5.80	6.96	8.70	9.86	11.60	12.76	14.50
Engine Coolant Temp (F)	-40.0	-36.4	-31.0	-27.4	-22.0	-18.4	-13.0	-9.4	-4.0	-0.4	5.0
Battery Voltage (V)	0.00	0.35	0.75	1.10	1.50	1.85	2.25	2.60	3.00	3.35	3.75
Fuel Level (%)	0.0	0.8	2.0	2.8	4.0	4.8	6.0	6.8	8.0	8.8	10.0
Vehicle Speed (MPH)	0.00	1.56	3.12	4.68	6.24	7.80	9.36	10.92	12.48	14.03	15.60
Engine Boost Pressure (PSI)	0.0	0.6	1.4	2.0	2.9	3.5	4.3	4.9	5.8	6.4	7.3
Instant Fuel Economy (MPG)	0.0	1.1	2.2	3.4	4.5	5.6	6.7	7.9	9.0	10.1	11.2
Instant Fuel Rate (GPH)	0.0	0.7	1.5	2.2	3.0	3.7	4.5	5.2	6.0	6.7	7.5
Accelerator Position (%)	0.0	0.8	2.0	2.8	4.0	4.8	6.0	6.8	8.0	8.8	10.0
Inlet Air Temp (F)	-40.0	-36.4	-32.8	-29.2	-25.5	-22.0	-18.4	-14.8	-11.2	-7.6	-4.0
Engine Load %	0	1	2	3	5	6	7	8	10	11	12
Engine Trip (mile)	0.0	15.5	31.1	46.6	62.1	77.7	93.2	108.7	124.3	139.8	155.3
Total Vehicle Distance (mile)	0.0	31.1	62.1	93.2	124.3	155.3	186.4	217.5	248.5	279.6	310.7
Transmission Temp (F)	-459.4	-438.5	-417.5	-396.5	-375.5	-354.5	-333.6	-312.6	-291.7	-270.7	-249.7
Vehicle Identification (VIN)	~000*	~001*	~002*	~003*	~004*	~005*	~006*	~007*	~008*	~009*	~010*

Table 5 – 6 SAE J1939 Simulation result vs. control step values (from 11 to 20)

Control Step	11	12	13	14	15	16	17	18	19	20
RPM (rpm)	883.50	963.75	1044.13	1124.38	1204.75	1285.00	1365.38	1445.63	1526.00	1606.38
Engine Hour (Hr)	137.5	150.0	162.5	175.0	187.5	200.0	212.5	225.0	237.5	250.0
Engine Oil Pressure (PSI)	15.66	17.40	18.56	20.30	21.46	23.20	24.36	26.10	27.26	29.00
Engine Coolant Temp (F)	8.6	14.0	17.6	23.0	26.6	32.0	35.6	41.0	44.6	50.0
Battery Voltage (V)	4.10	4.50	4.85	5.25	5.60	6.00	6.35	6.75	7.10	7.50
Fuel Level (%)	10.8	12.0	12.8	14.0	14.8	16.0	16.8	18.0	18.8	20.0
Vehicle Speed (MPH)	17.16	18.71	20.27	21.83	23.39	24.95	26.50	28.07	29.63	31.19
Engine Boost Pressure (PSI)	7.8	8.7	9.3	10.1	10.7	11.6	12.2	13.0	13.6	14.5
Instant Fuel Economy (MPG)	12.4	13.5	14.6	15.7	16.9	18.0	19.1	20.2	21.4	22.5
Instant Fuel Rate (GPH)	8.2	9.0	9.7	10.5	11.2	12.0	12.7	13.5	14.2	15.0
Accelerator Position (%)	10.8	12.0	12.8	14.0	14.8	16.0	16.8	18.0	18.8	20.0
Inlet Air Temp (F)	-0.4	3.2	6.8	10.4	14.0	17.6	21.2	24.8	28.4	32.0
Engine Load %	13	15	16	17	18	20	21	22	23	25
Engine Trip (mile)	170.9	186.4	201.9	217.5	233.0	248.5	264.1	279.6	295.2	310.7
Total Vehicle Distance (mile)	341.8	372.8	403.9	435.0	466.0	497.1	528.2	559.2	590.3	621.4
Transmission Temp (F)	-228.8	-207.8	-186.8	-165.8	-144.9	-123.9	-102.9	-82.0	-61.0	-40.0
Vehicle Identification (VIN)	~011*	~012*	~013*	~014*	~015*	~016*	~017*	~018*	~019*	~020*

Table 5 – 7 SAE J1939 Simulation result vs. control step values (from 21 to 30)

Control Step	21	22	23	24	25	26	27	28	29	30
RPM (rpm)	1686.63	1767.00	1847.25	1927.63	2007.88	2088.25	2168.50	2248.88	2329.13	2409.50
Engine Hour (Hr)	262.5	275.0	287.5	300.0	312.5	325.0	337.5	350.0	362.5	375.0
Engine Oil Pressure (PSI)	30.16	31.90	33.06	34.80	35.96	37.70	38.86	40.60	41.76	43.50
Engine Coolant Temp (F)	53.6	59.0	62.6	68.0	71.6	77.0	80.6	86.0	89.6	95.0
Battery Voltage (V)	7.85	8.25	8.60	9.00	9.35	9.75	10.10	10.50	10.85	11.25
Fuel Level (%)	20.8	22.0	22.8	24.0	24.8	26.0	26.8	28.0	28.8	30.0
Vehicle Speed (MPH)	32.75	34.31	35.87	37.43	38.99	40.55	42.11	43.67	45.23	46.79
Engine Boost Pressure (PSI)	15.1	15.9	16.5	17.4	18.0	18.9	19.4	20.3	20.9	21.8
Instant Fuel Economy (MPG)	23.6	24.7	25.9	27.0	28.1	29.2	30.4	31.5	32.6	33.7
Instant Fuel Rate (GPH)	15.7	16.5	17.2	18.0	18.7	19.5	20.2	21.0	21.7	22.5
Accelerator Position (%)	20.8	22.0	22.8	24.0	24.8	26.0	26.8	28.0	28.8	30.0
Inlet Air Temp (F)	35.6	39.2	42.8	46.4	50.0	53.6	57.2	60.8	64.4	68.0
Engine Load %	26	27	28	30	31	32	33	35	36	37
Engine Trip (mile)	326.2	341.8	357.3	372.8	388.4	403.9	419.4	435.0	450.5	466.0
Total Vehicle Distance (mile)	652.4	683.5	714.6	745.6	776.7	807.8	838.9	869.9	901.0	932.1
Transmission Temp (F)	-32.8	-25.6	-18.4	-11.2	-4.0	3.2	10.4	17.6	24.8	32.0
Vehicle Identification (VIN)	~021*	~022*	~023*	~024*	~025*	~026*	~027*	~028*	~029*	~030*

Table 5 – 8 SAE J1939 Simulation result vs. control step values (from 31 to 40)

Control Step	31	32	33	34	35	36	37	38	39	40
RPM (rpm)	2489.88	2570.13	2650.50	2730.75	2811.13	2891.38	2971.75	3052.00	3132.38	3212.75
Engine Hour (Hr)	387.5	400.0	412.5	425.0	437.5	450.0	462.5	475.0	487.5	500.0
Engine Oil Pressure (PSI)	44.66	46.40	47.56	49.30	50.46	52.20	53.36	55.10	56.26	58.00
Engine Coolant Temp (F)	98.6	104.0	107.6	113.0	116.6	122.0	125.6	131.0	134.6	140.0
Battery Voltage (V)	11.60	12.00	12.35	12.75	13.10	13.50	13.85	14.25	14.60	15.00
Fuel Level (%)	30.8	32.0	32.8	34.0	34.8	36.0	36.8	38.0	38.8	40.0
Vehicle Speed (MPH)	48.35	49.91	51.47	53.07	54.59	56.14	57.71	59.26	60.82	62.38
Engine Boost Pressure (PSI)	22.3	23.2	23.8	24.6	25.2	26.1	26.7	27.5	28.1	29.0
Instant Fuel Economy (MPG)	34.9	36.0	37.1	38.2	39.4	40.5	41.6	42.7	43.9	45.0
Instant Fuel Rate (GPH)	23.2	24.0	24.7	25.5	26.2	27.0	27.7	28.5	29.2	30.0
Accelerator Position (%)	30.8	32.0	32.8	34.0	34.8	36.0	36.8	38.0	38.8	40.0
Inlet Air Temp (F)	71.6	75.2	78.8	82.4	86.0	89.6	93.2	96.8	100.4	104.0
Engine Load %	38	40	41	42	43	45	46	47	48	50
Engine Trip (mile)	481.6	497.1	512.6	528.2	543.7	559.2	574.8	590.3	605.8	621.4
Total Vehicle Distance (mile)	963.1	994.2	1025.3	1056.3	1087.4	1118.5	1149.5	1180.6	1211.7	1242.7
Transmission Temp (F)	39.2	46.4	53.6	60.8	68.0	75.2	82.4	89.6	96.8	104.0
Vehicle Identification (VIN)	~031*	~032*	~033*	~034*	~035*	~036*	~037*	~038*	~039*	~040*



Table 5 – 9 SAE J1939 Simulation result vs. control step values (from 41 to 50)

Control Step	41	42	43	44	45	46	47	48	49	50
RPM (rpm)	3293.00	3373.38	3453.63	3534.00	3614.25	3694.63	3774.88	3855.25	3935.50	4015.88
Engine Hour (Hr)	512.5	525.0	537.5	550.0	562.5	575.0	587.5	600.0	612.5	625.0
Engine Oil Pressure (PSI)	59.16	60.90	62.06	63.80	64.96	66.70	67.86	69.60	70.76	72.50
Engine Coolant Temp (F)	143.6	149.0	152.6	158.0	161.6	167.0	170.6	176.0	179.6	185.0
Battery Voltage (V)	15.35	15.75	16.10	16.50	16.85	17.25	17.60	18.00	18.35	18.75
Fuel Level (%)	40.8	42.0	42.8	44.0	44.8	46.0	46.8	48.0	48.8	50.0
Vehicle Speed (MPH)	63.94	65.50	67.06	68.62	70.18	71.74	73.30	74.86	76.42	77.98
Engine Boost Pressure (PSI)	29.6	30.4	31.0	31.9	32.5	33.3	33.9	34.8	35.4	36.3
Instant Fuel Economy (MPG)	46.1	47.2	48.4	49.5	50.6	51.7	52.9	54.0	55.1	56.2
Instant Fuel Rate (GPH)	30.7	31.5	32.2	33.0	33.7	34.5	35.2	36.0	36.7	37.5
Accelerator Position (%)	40.8	42.0	42.8	44.0	44.8	46.0	46.8	48.0	48.8	50.0
Inlet Air Temp (F)	107.6	111.2	114.8	118.4	122.0	125.6	129.2	132.8	136.4	140.0
Engine Load %	51	52	53	55	56	57	58	60	61	62
Engine Trip (mile)	636.9	652.4	668.0	683.5	699.0	714.6	730.1	745.6	761.2	776.7
Total Vehicle Distance (mile)	1273.8	1304.9	1336.0	1367.0	1389.1	1429.2	1460.2	1491.3	1522.4	1553.4
Transmission Temp (F)	111.2	118.4	125.6	132.8	140.0	147.2	154.4	161.6	168.8	176.0
Vehicle Identification (VIN)	~041*	~042*	~043*	~044*	~045*	~046*	~047*	~048*	~049*	~050*

Table 5 – 10 SAE J1939 Simulation result vs. control step values (from 51 to 60)

Control Step	51	52	53	54	55	56	57	58	59	60
RPM (rpm)	4096.25	4176.50	4256.88	4337.13	4417.50	4497.75	4578.13	4685.38	4738.75	4819.13
Engine Hour (Hr)	637.5	650.0	662.5	675.0	687.5	700.0	712.5	725.0	737.5	750.0
Engine Oil Pressure (PSI)	73.66	75.40	76.56	78.30	79.46	81.20	82.36	84.10	85.26	87.00
Engine Coolant Temp (F)	188.6	194.0	197.6	203.0	206.6	212.0	215.6	221.0	244.6	230.0
Battery Voltage (V)	19.10	19.50	19.85	20.25	20.60	21.00	21.35	21.75	22.10	22.50
Fuel Level (%)	50.8	52.0	52.8	54.0	54.8	56.0	56.8	58.0	58.8	60.0
Vehicle Speed (MPH)	79.54	81.10	82.66	84.22	85.78	87.34	88.90	90.46	92.02	93.58
Engine Boost Pressure (PSI)	36.8	37.7	38.3	39.1	39.7	40.6	41.2	42.0	42.6	43.5
Instant Fuel Economy (MPG)	57.4	58.5	59.6	60.7	61.9	63.0	64.1	65.2	66.4	67.5
Instant Fuel Rate (GPH)	38.2	39.0	39.7	40.5	41.2	42.0	42.7	43.5	44.2	45.0
Accelerator Position (%)	50.8	52.0	52.8	54.0	54.8	56.0	56.8	58.0	58.8	60.0
Inlet Air Temp (F)	143.6	147.2	150.8	154.4	158.0	161.6	165.2	168.8	172.4	176.0
Engine Load %	63	65	66	67	68	70	71	72	73	75
Engine Trip (mile)	792.3	807.8	823.3	838.9	854.4	869.6	885.5	901.0	916.5	932.1
Total Vehicle Distance (mile)	1584.3	1615.6	1646.6	1677.7	1708.8	1739.8	1770.9	1802.0	1833.0	1864.1
Transmission Temp (F)	183.2	190.4	197.6	204.8	212.0	219.2	226.4	233.6	240.8	248.0
Vehicle Identification (VIN)	~051*	~052*	~053*	~054*	~055*	~056*	~057*	~058*	~059*	~060*

Table 5 – 11 SAE J1939 Simulation result vs. control step values (from 61 to 70)

Control Step	61	62	63	64	65	66	67	68	69	70
RPM (rpm)	4899.38	4979.75	5060.00	5140.38	5220.63	5301.00	5381.25	5461.63	5541.88	5622.25
Engine Hour (Hr)	762.5	775.0	787.5	800.0	812.5	825.0	837.5	850.0	862.5	875.0
Engine Oil Pressure (PSI)	88.16	89.90	91.06	92.80	93.96	95.70	96.86	98.60	99.76	101.50
Engine Coolant Temp (F)	233.6	239.0	242.6	248.0	251.6	257.0	260.6	266.0	269.6	275.0
Battery Voltage (V)	22.85	23.25	23.60	24.00	24.35	24.75	25.10	25.50	25.85	26.25
Fuel Level (%)	60.8	62.0	62.8	64.0	64.8	66.0	66.8	68.0	68.8	70.0
Vehicle Speed (MPH)	95.14	96.70	98.25	99.83	101.37	102.93	104.49	106.05	107.61	109.17
Engine Boost Pressure (PSI)	44.1	44.9	45.5	46.4	47.0	47.8	48.4	49.3	49.9	50.8
Instant Fuel Economy (MPG)	68.6	69.7	70.9	72.0	73.1	74.2	75.4	76.5	77.6	78.8
Instant Fuel Rate (GPH)	45.7	46.5	47.2	48.0	48.7	49.5	50.2	51.0	51.7	52.5
Accelerator Position (%)	60.8	62.0	62.8	64.0	64.8	66.0	66.8	68.0	68.8	70.0
Inlet Air Temp (F)	179.2	183.2	186.8	190.4	194.0	197.6	201.2	204.8	208.4	212.0
Engine Load %	76	77	78	80	81	82	83	85	86	87
Engine Trip (mile)	947.6	963.1	978.7	994.2	1009.7	1025.3	1040.8	1056.3	1071.9	1087.4
Total Vehicle Distance (mile)	1895.2	1926.3	1957.3	1988.4	2019.5	2050.5	2081.6	2112.7	2143.7	2174.8
Transmission Temp (F)	255.2	262.4	269.6	276.8	284.0	291.2	298.4	305.6	312.8	320.0
Vehicle Identification (VIN)	~061*	~062*	~063*	~064*	~065*	~066*	~067*	~068*	~069*	~070*

Table 5 – 12 SAE J1939 Simulation result vs. control step values (from 71 to 80)

Control Step	71	72	73	74	75	76	77	78	79	80
RPM (rpm)	5702.63	5782.88	5863.25	5943.50	6023.88	6104.13	6184.50	6264.75	6345.13	6425.50
Engine Hour (Hr)	887.5	900.0	912.5	925.0	937.5	950.0	962.5	975.0	987.5	1000.0
Engine Oil Pressure (PSI)	102.66	104.40	105.56	107.30	108.46	110.20	111.36	113.10	114.26	116.00
Engine Coolant Temp (F)	278.6	284.0	287.6	293.0	296.6	302.0	305.6	311.0	314.6	320.0
Battery Voltage (V)	26.60	27.00	27.35	27.75	28.10	28.50	28.85	29.25	29.60	30.00
Fuel Level (%)	70.8	72.0	72.8	74.0	74.8	76.0	76.8	78.0	78.8	80.0
Vehicle Speed (MPH)	110.73	112.29	113.85	115.41	116.97	118.53	120.09	121.65	123.21	124.77
Engine Boost Pressure (PSI)	51.3	52.2	52.8	53.6	54.2	55.1	55.7	56.5	57.1	58.0
Instant Fuel Economy (MPG)	79.9	81.0	82.1	83.2	84.4	85.5	86.6	87.7	88.9	90.0
Instant Fuel Rate (GPH)	53.2	54.0	54.4	55.5	56.2	57.0	57.7	58.5	59.2	60.0
Accelerator Position (%)	70.8	72.0	72.4	74.0	74.8	76.0	76.8	78.0	78.8	80.0
Inlet Air Temp (F)	215.6	219.2	222.8	226.4	230.0	233.6	237.2	240.8	244.4	248.0
Engine Load %	88	90	91	92	93	95	96	97	98	100
Engine Trip (mile)	1102.9	1118.5	1134.0	1149.5	1165.1	1180.6	1196.1	1211.7	1227.2	1242.7
Total Vehicle Distance (mile)	2205.9	2236.9	2268.0	2299.1	2330.1	2361.2	2392.3	2423.4	2454.4	2485.5
Transmission Temp (F)	327.2	334.4	341.6	348.8	356.0	363.2	370.4	377.6	384.8	392.0
Vehicle Identification (VIN)	~071*	~072*	~073*	~074*	~075*	~076*	~077*	~078*	~079*	~080*

Table 5 – 13 SAE J1939 Simulation result vs. control step values (from 81 to 90)

Control Step	81	82	83	84	85	86	87	88	89	90
RPM (rpm)	6505.75	6586.13	6666.38	6746.75	6827.00	6907.38	6987.63	7068.00	7148.25	7228.63
Engine Hour (Hr)	5095.0	100899.9	150849.8	200799.8	250749.7	300699.7	350649.6	400599.6	450549.5	500499.5
Engine Oil Pressure (PSI)	117.16	118.90	120.06	121.80	122.96	124.70	125.86	127.60	128.76	130.50
Engine Coolant Temp (F)	323.6	329.0	332.6	338.0	341.6	347.0	350.6	356.0	359.6	365.0
Battery Voltage (V)	33.00	36.00	39.00	42.00	45.00	48.00	51.00	54.00	57.00	60.00
Fuel Level (%)	80.8	82.0	82.8	84.0	85.8	86.0	86.8	88.0	88.8	90.0
Vehicle Speed (MPH)	126.33	127.89	129.45	131.01	132.57	134.13	135.68	137.25	138.80	140.36
Engine Boost Pressure (PSI)	58.6	59.4	60.0	60.9	61.5	62.3	62.9	63.8	64.4	65.3
Instant Fuel Economy (MPG)	100.3	110.5	120.8	131.0	141.3	151.6	161.8	172.1	182.3	192.6
Instant Fuel Rate (GPH)	99.4	138.9	178.3	217.7	257.2	296.6	336.0	375.5	414.9	454.3
Accelerator Position (%)	80.8	82.0	82.8	84.0	84.8	86.0	86.8	88.0	88.8	90.0
Inlet Air Temp (F)	255.2	264.2	271.4	280.4	287.6	296.6	303.8	312.8	320.0	329.0
Engine Load %	101	102	103	105	106	107	108	110	111	112
Engine Trip (mile)	32249.2	63255.7	94262.1	125268.6	156275.1	187281.5	218288.0	249494.4	280300.9	311307.4
Total Vehicle Distance (mile)	33429.8	64374.1	95318.4	126262.8	157207.1	188151.4	219095.8	250040.1	280984.4	311928.8
Transmission Temp (F)	530.1	668.2	806.4	944.5	1082.7	1220.8	1359.0	1497.1	1635.3	1773.4
Vehicle Identification (VIN)	~081*	~082*	~083*	~084*	~085*	~086*	~087*	~088*	~089*	~090*

Table 5 – 14 SAE J1939 Simulation result vs. control step values (from 91 to 100)

Control Step	91	92	93	94	95	96	97	98	99	100
RPM (rpm)	7309.00	7389.25	7469.63	7549.88	7630.25	7710.50	7790.88	7871.13	7951.50	8031.88
Engine Hour (Hr)	550449.4	600399.4	650349.3	700299.3	750249.2	800199.2	850149.2	900099.1	950049.0	999999.0
Engine Oil Pressure (PSI)	131.66	133.40	134.56	136.30	137.46	139.20	140.36	142.10	143.26	145.00
Engine Coolant Temp (F)	368.6	374.0	377.6	383.0	386.6	392.0	395.6	401.0	404.6	410.0
Battery Voltage (V)	375.25	690.55	1005.80	1321.10	1636.35	1951.65	2266.90	2582.20	2897.45	3212.75
Fuel Level (%)	90.8	92.0	92.8	94.0	94.8	96.0	96.8	95.0	98.8	100.0
Vehicle Speed (MPH)	141.93	143.48	145.04	146.60	148.16	149.72	151.28	152.84	154.40	155.96
Engine Boost Pressure (PSI)	65.8	66.7	67.3	68.2	68.7	69.6	70.2	71.0	71.6	72.5
Instant Fuel Economy (MPG)	202.8	213.1	223.4	233.6	243.9	254.2	264.4	274.7	284.9	295.2
Instant Fuel Rate (GPH)	493.8	533.2	572.7	612.1	651.5	691.0	730.4	769.8	809.3	848.7
Accelerator Position (%)	90.8	92.0	92.8	94.0	94.8	96.0	96.8	98.0	98.8	100.0
Inlet Air Temp (F)	336.2	345.2	352.4	361.4	368.6	377.6	384.8	393.8	401.0	410.0
Engine Load %	113	115	116	117	118	120	121	122	123	125
Engine Trip (mile)	342313.9	373320.4	404326.8	435333.3	466339.8	497346.2	528352.7	559359.1	590365.6	621372.1
Total Vehicle Distance (mile)	342873.1	373817.5	404761.7	435706.1	466650.5	497594.7	528539.1	559483.4	590427.8	621372.1
Transmission Temp (F)	1911.6	2049.7	2187.9	2326.0	2464.2	2602.3	2740.5	2878.6	3016.8	3154.9
Vehicle Identification (VIN)	~091*	~092*	~093*	~094*	~095*	~096*	~097*	~098*	~099*	~100*

## Appendix A - Remote Terminal GUI Installation Guide

A remote terminal program can be used to control and display detail information of simulated SAE J1939 signals on a PC screen.

### A.1. What you need before install Au J1939 Simulator Remote Terminal GUI

1. A "Plus" edition of Au SAE J1939 Simulator (Engine Basic plus Edition or Engine Premium plus edition or Vehicle Platinum plus Edition).
2. PC software: The installation program "AU setup J1939 Simulator Remote Terminal V1.00A" will be provided when Au SAE-J1939 Simulator is ordered.
3. A PC equipped with serial port, with a serial extension cable
4. Or a PC equipped with USB port, plus a "USB to Serial Converter".

### A.2. Step by step guide on installing the software to your PC.

1. Double click the "Setup J1939 Simulator Remote Terminal V1.00A" installation file, as shown in Figure A-1.

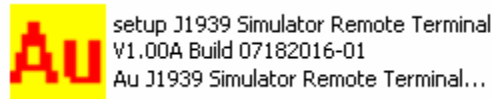


Figure A-1

2. Open file – security warning window pop up, click "Run" ( Figure A-2 )

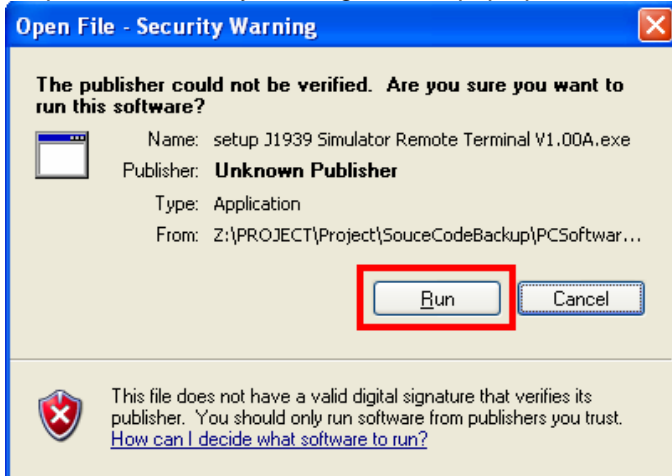


Figure A-2

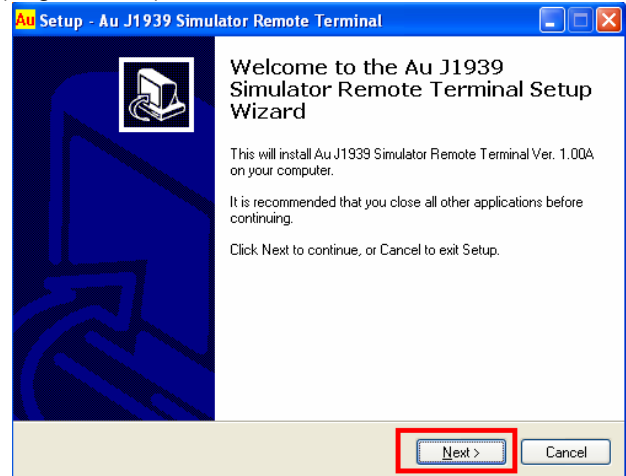


Figure A-3

3. "Welcome to the Au J1939 Simulator Remote Terminal Setup Wizard" window pop up, click "Next" to continue (Figure A-3).
4. "License Agreement" window pop up, please read the license agreement and select "I accept the agreement", click "Next" to continue (Figure A-4).

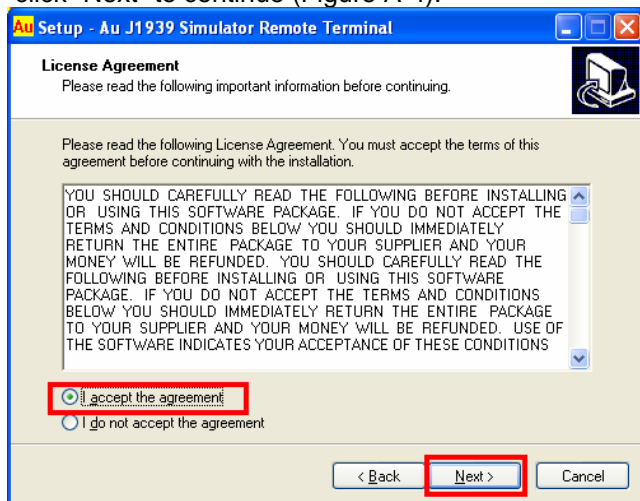


Figure A-4

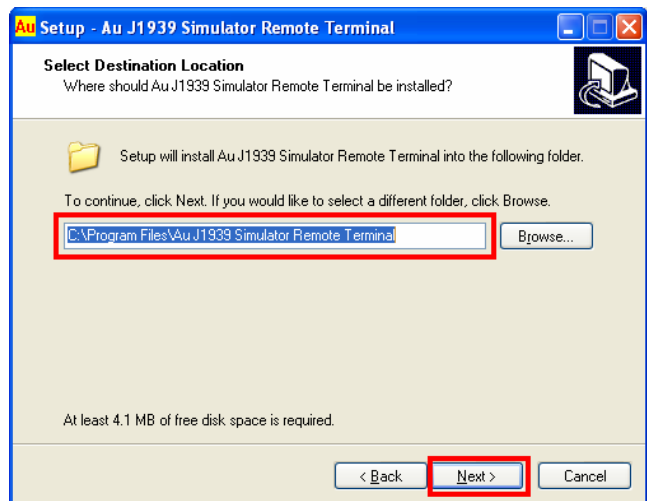


Figure A-5



5. "Select Destination Location" window pop up, use the default folder, and click "Next" to continue (Figure A-5).
6. "Select Start Menu Folder" window pop up, use the default folder and click "Next" to continue (Figure A-6).

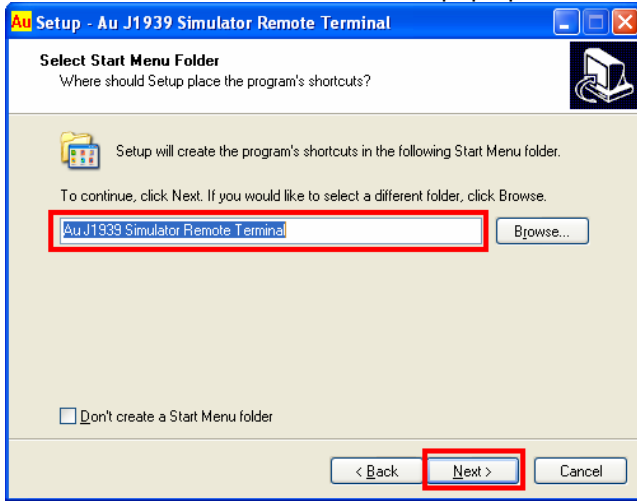


Figure A-6

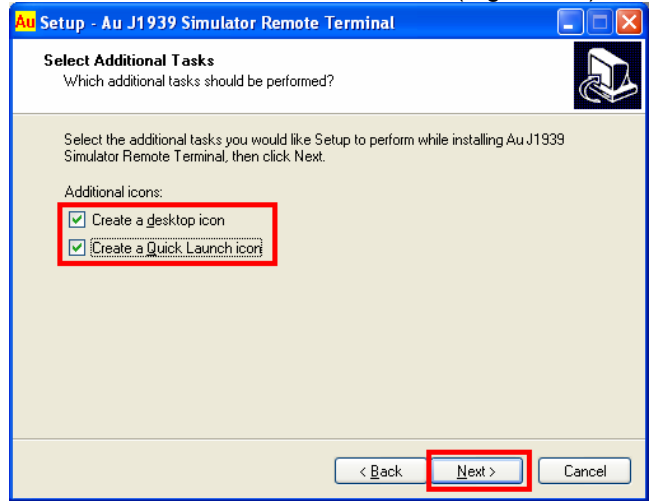


Figure A-7

7. "Select Additional Tasks" window pop up, check both "Create a desktop icon, and Create a Quick Launch icon", click "Next" to continue (Figure A-7).
8. "Ready to Install" window pop up, click "Install" (Figure A-8)

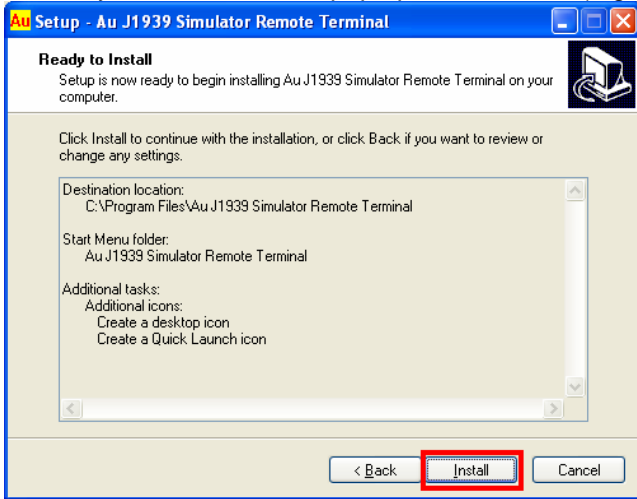


Figure A-8

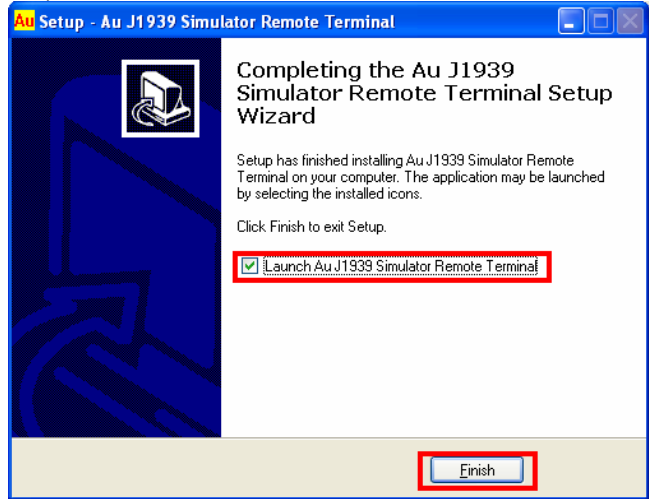


Figure A-9

9. Check "launch Au J1939 Simulator Remote Terminal", click "Finish" (Figure A-9)

## Appendix B - CAN Baud Rate Configuration

Au J1939 Simulator can be configured to the following 5 baud rate: 62.5K bps, 125K bps, 250K bps, 500K bps, 1M bps. The default factory setting of Au J1939 Simulator CAN Baud Rate is 250K bps. The following example illustrate on how to change the default CAN baud rate from 250K bps to 500K bps.

Video demonstration can be view from the link here: <https://youtu.be/J7ii7VnbSio>

B.1. Click Au icon on Au J1939 Simulator Remote Terminal GUI, then click "About J1939 Simulator Remote Terminal..." button from the list.

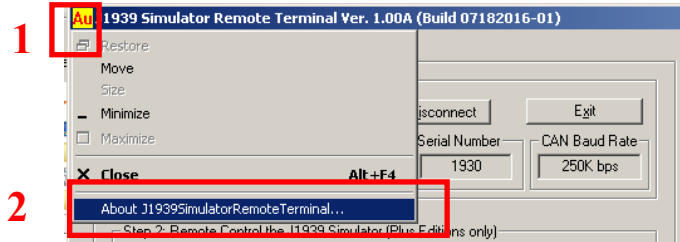


Figure B-1

B.2. Click "Proceed to Change CAN Baud Rate"

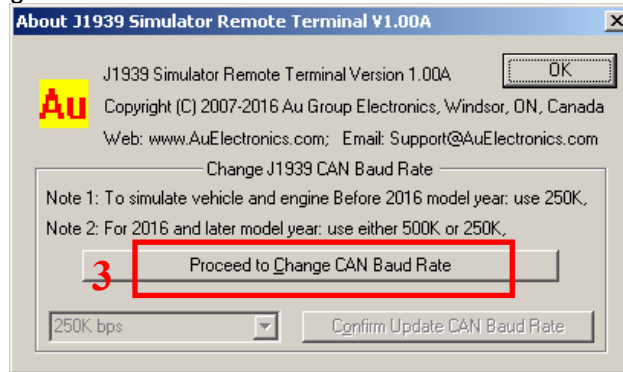


Figure B-2

B.3. Choose 500K bps from the drop down list, then click "Confirm Update CAN Baud Rate" button.

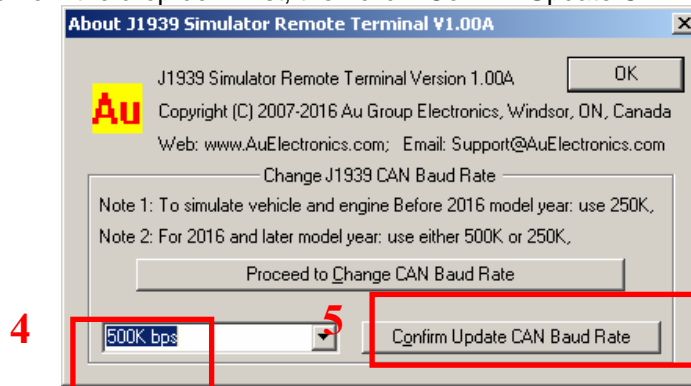


Figure B-3

B.4. Notice that the CAN Baud Rate now changed to 500K bps.

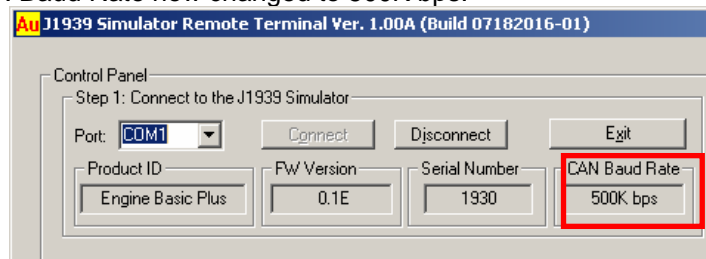


Figure B-4

## Appendix C - License Management Toolset

Au J1939 Simulator License Management Toolset enables user to upgrade Au J1939 Simulator from Basic Edition(s) to Platinum Edition(s) or Vehicle Edition in-field. For instance, an engine basic edition can be upgraded to an engine premium edition.

### C.1. What you need for upgrade Au SAE-J1939 Simulator License.

1. Order new license code from the following web link:  
<http://www.auelectronics.com/System-J1939Simulator.htm>
2. PC software: "AU J1939 Simulator License Management Toolset V2.00A" is included in the software disc when any Au J1939 Simulator is ordered.
3. A PC equipped with serial port and a serial extension cable or a PC equipped with USB port and a "USB to Serial Converter".

### C.2. Step by Step License management Toolset Installation

**Note:** For any user had the License management Toolset installed on your PC before, please bypass step 1 to step 8, and start with step 9.

1. Double click the installation program of "AU setup J1939 Simulator License Management Toolset V2.00A", as shown in Figure C-1.

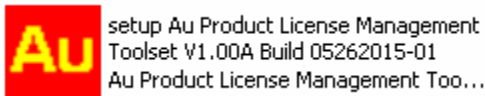


Figure C-1

2. "Welcome to Au J1939 simulator License Management Toolset Setup wizard" window shows up, click "next", as shown in Figure C-2
3. "License Agreement" window shows up, please read the license agreement and select "I accept the agreement", then click "next" (Figure C-3)

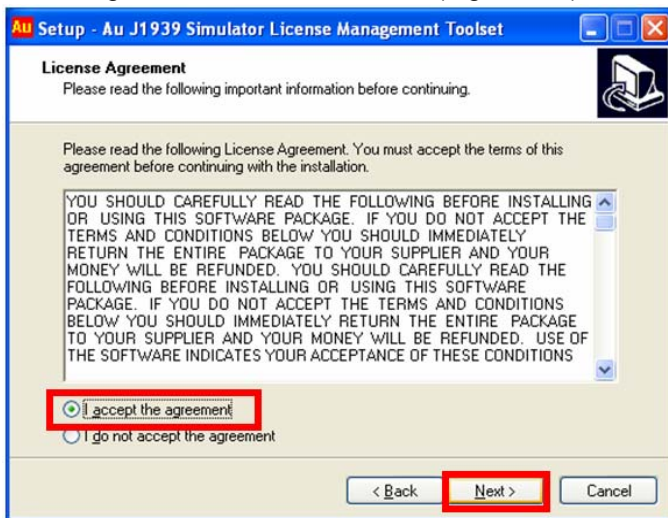


Figure C-2



Figure C-3

4. "Select Destination" window shows up, use default: C:\Program Files\ AU J1939 Simulator License Management Toolset", then click "next" (Figure C-4).
5. "Select Start Menu Folder" window shows up, use default setting "AU J1939 Simulator License Management Toolset", then click "next" (Figure C-5)

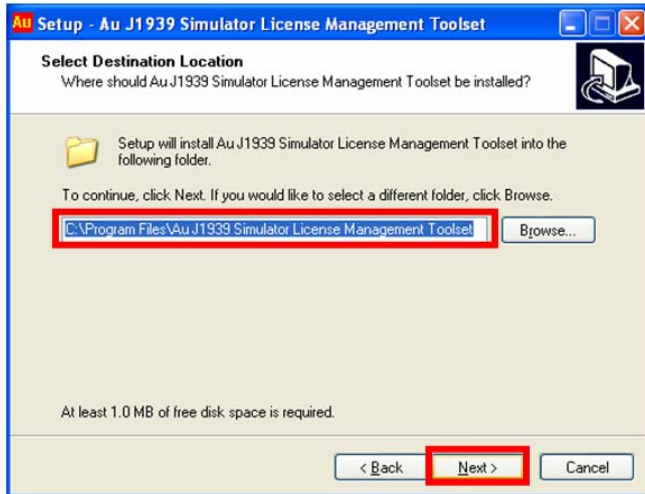


Figure C-4

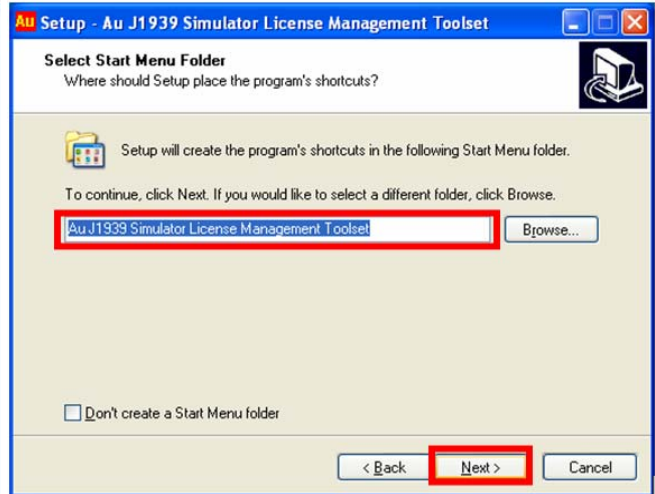


Figure C-5

6. "Select Additional Task" window shows up, check both "create a desktop icon" and "Create a quick launch icon", then click "next" (Figure C-6)
7. "Ready to Install" window shows up, click "Install", as shown in Figure C-7.

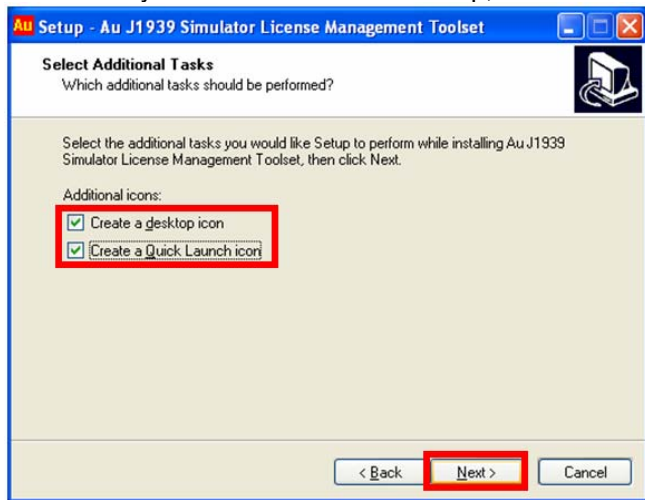


Figure C-6

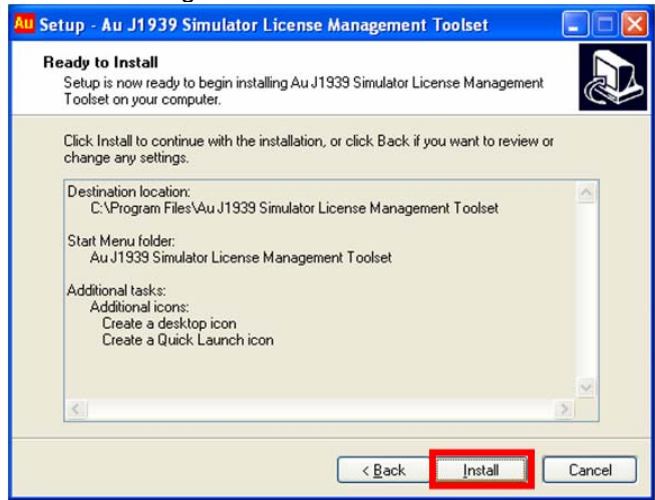


Figure C-7

8. Wait until "Completing Au J1939 Simulator License Management Toolset Setup Wizard" window shows up, check "launch Au J1939 Simulator License Management Toolset", then click "Finish" (Figure C-8, Figure C-9).



Figure C-8

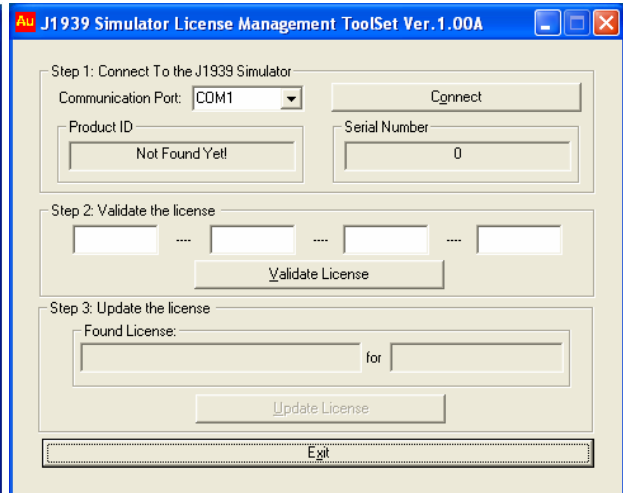


Figure C-9



### C.3. Step by Step License Upgrading Procedure

Use a serial cable to connect PC with the J1939 simulator, and then proceed to next step.

1. Select a proper Serial Communication Port, e.g. COM1, which is used to connect Au J1939 Simulator, then click "Connect" button.

Au J1939 simulator ID and serial number will show up (Figure C-10). Notice that Product ID showing "Engine Basic" in this demonstration.

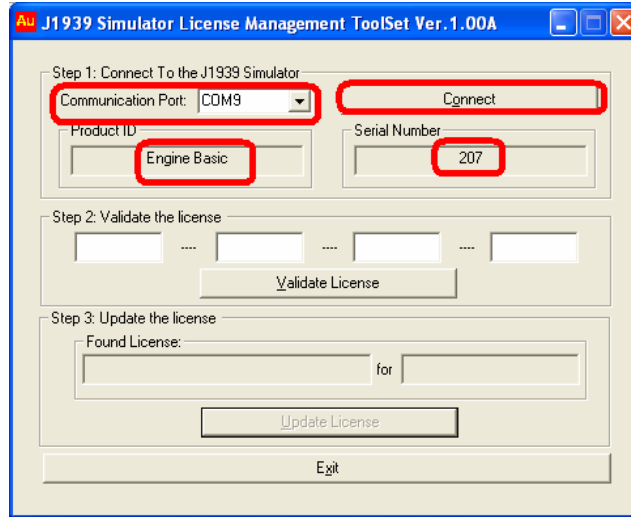


Figure C-10

**Note:** Each Au J1939 Simulator will have a unique Serial Number and may have a different Product ID (J1939 Simulator Edition).

2. Enter a validate license code in the license management toolset, then click "Validate license" button (Figure C-11)

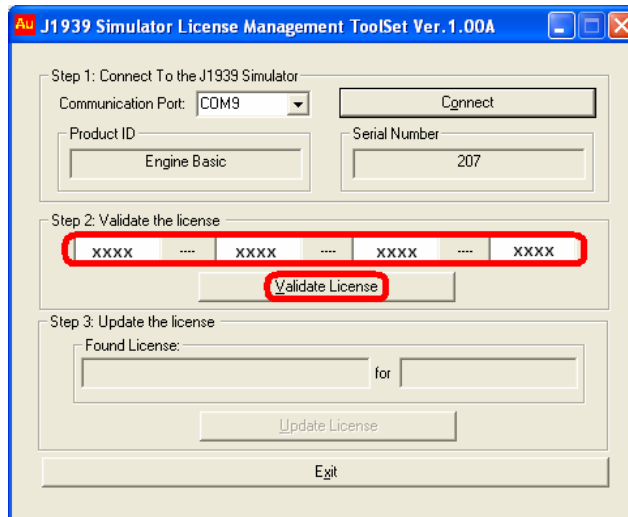


Figure C-11

3. Au J1939 Simulator License Toolset will check if entered license number is valid or not. If not, "the license is not for this product" message window will show up, click OK, "Sorry, Invalidate license!" then show up, click OK, (Figure C-12).

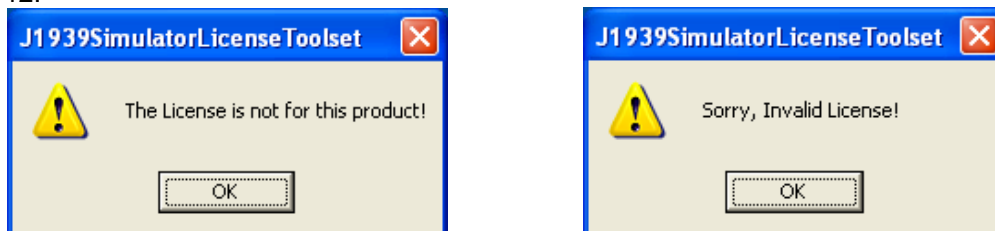


Figure C-12 – Warning message boxes show up if license is not valid

- After a validate license is entered, Au J1939 Simulator License Toolset will show the license information for the new license code, click "Update License" button (Figure C-13), Engine premium is demonstrated here.

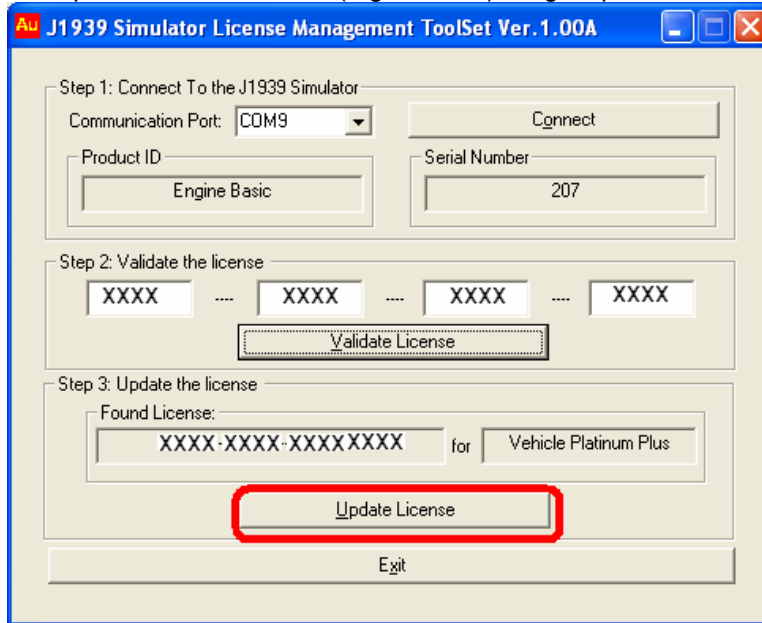


Figure C-13 Engine premium license validate

- When it is updated successfully, a beep will be heard. And Au J1939 Simulator License Toolset will show the new license (Engine premium in this demonstration), it means your product has been upgraded to engine premium edition successfully, click "Exit", as shown in Figure C-14.

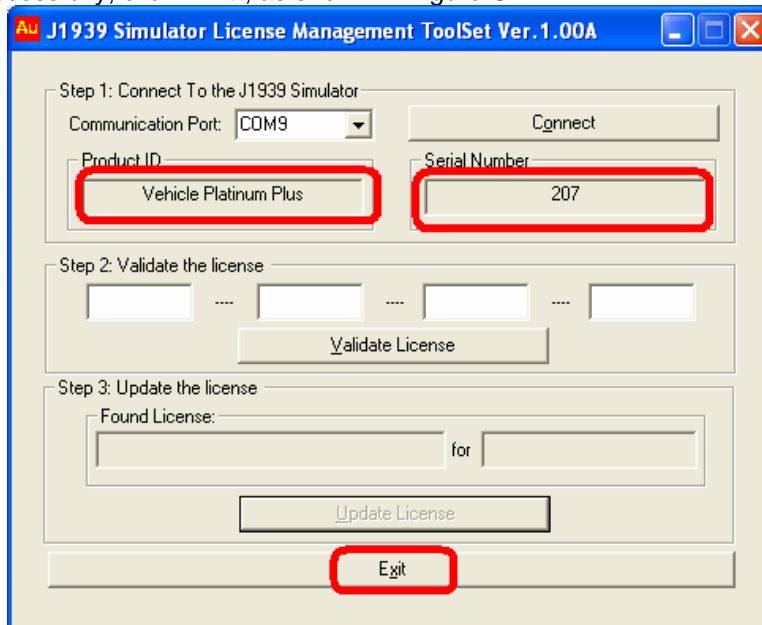


Figure C-14 Product updated to Engine premium successfully

## Appendix D - Au PIC Serial Bootloader Application Note

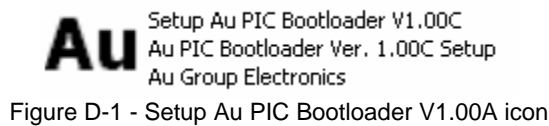
### D.1. What's needed Before Install Au PIC Bootloader?

- A PC equipped with serial port or PC equipped with USB port + "USB to Serial Converter".
- Serial cable to connect a PC to a PIC target board.
- Au PIC Bootloader installation program (it is available through Au Group Electronics)
- An encrypted PIC-code file with extension of "aud" (it will be provided by Au Group Electronics for different products, e.g. SAE-J1939 simulator, etc.)

### D.2. How to Install Au PIC Bootloader

**Note:** If the Au PIC Bootloader has been installed on PC before, please bypass step 1 to step 8, and start with step 9.

1. Double click icon of the "Setup Au PIC Bootloader V1.00B" to start installing Au PIC Bootloader (Figure D-1).



2. "Welcome to the Au PIC Bootloader Setup Wizard" window show up, click "Next" (Figure D- 2)

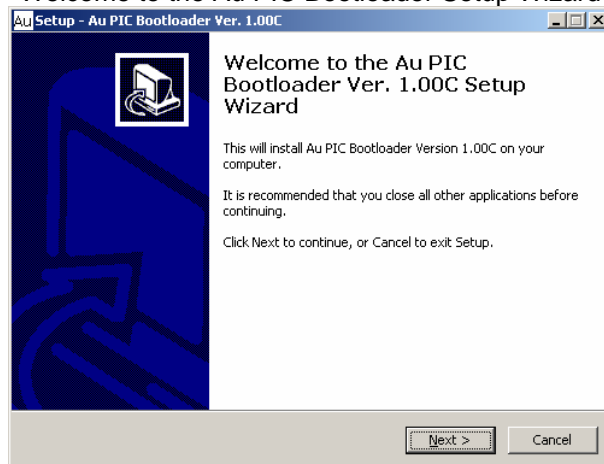


Figure D-2

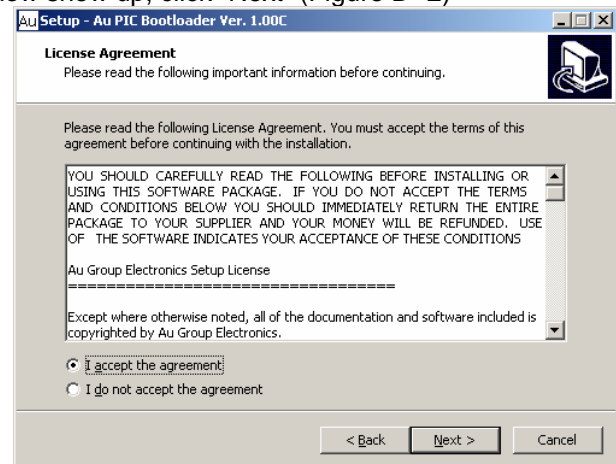


Figure D-3

3. "License Agreement" window show up, read the license agreement and select "I accept the agreement", then click "Next" to continue (Figure D-3).
4. "Select Destination" window shows up, use default path: C:\Program Files\ AU PIC Bootloader", then click "next" to continue (Figure D-4).

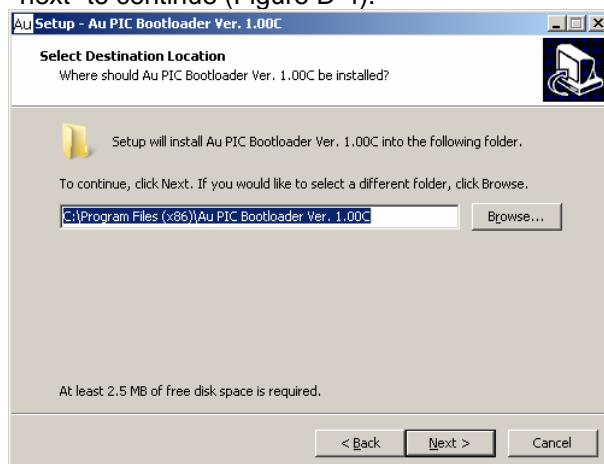


Figure D-4

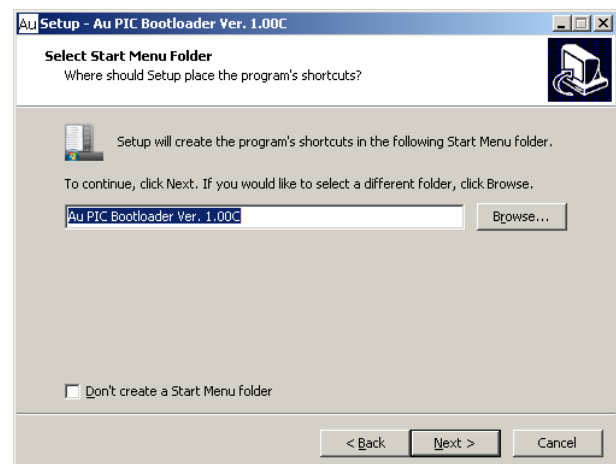


Figure D-5

- “Select Start Menu Folder” window show up, use default setting “AU PIC Bootloader”, then click “next” (Figure D-5).
- “Select Additional Task” window shows up, check both “create a desktop icon” and “Create a quick launch icon”, and then click “next” to continue (Figure D-6).

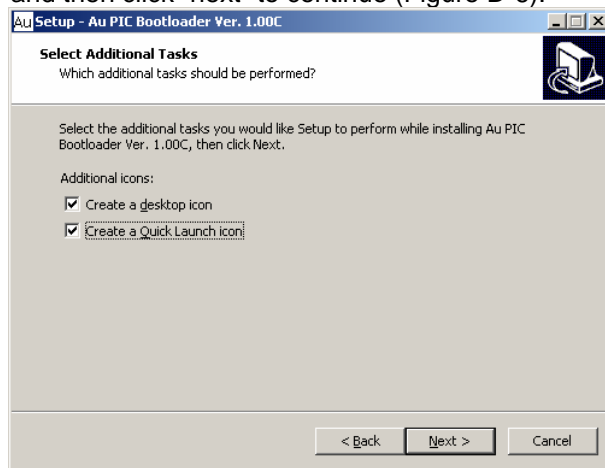


Figure D-6

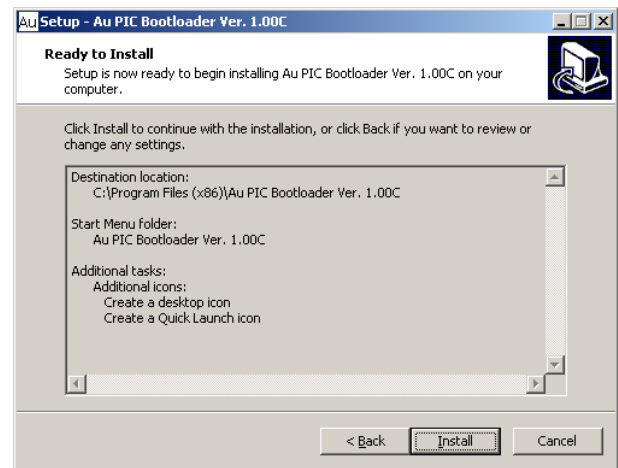


Figure D-7

- “Ready to Install” window shows up. Click “Install” (Figure D-7).
- After a few seconds, “Completing the Au PIC Bootloader Setup Wizard” window shows up, check “launch Au Bootloader”, click “Finish” to exit setup (FigureC-8).

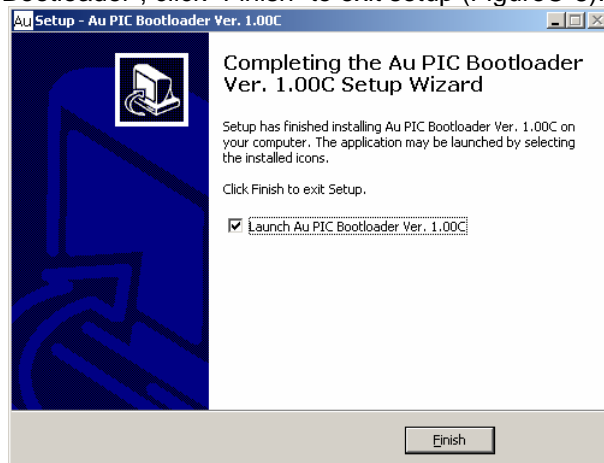


Figure D-8

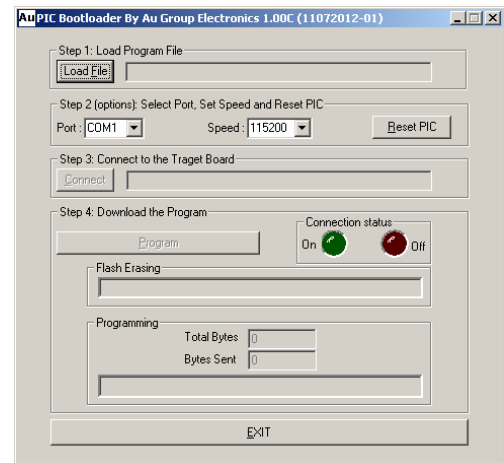


Figure D-9

- Au PIC18 Bootloader is launched, as shown in Figure D-9

### Thank You

Thank you for choosing Au Group Electronics products.

Should you have any question or comments, please contact us at:  
[support@AuElectronics.com](mailto:support@AuElectronics.com)

Please visit our website for recent product releases and the latest news.  
[www.AuElectronics.com](http://www.AuElectronics.com)

Our products can be ordered 24/7 at our on-line store:  
<http://www.auelectronics.com/products/>

We look forward to serving you again in the near future.