



Au SAE J1939 Data Center System User Manual

Rev. B

By Au Group Electronics

March, 2011



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Table of Contents

1.	AU J1939 DCS HARDWARE	3
1.1.	<i>Major Hardware Features</i>	<i>3</i>
1.2.	<i>3 ways of PC connection.....</i>	<i>3</i>
2.	AU J19393 DCS PC SOFTWARE WITH GUI	5
2.1.	<i>Major Software Features</i>	<i>5</i>
2.2.	<i>Control Item Area</i>	<i>5</i>
2.3.	<i>CAN Filter Area</i>	<i>6</i>
2.4.	<i>Data Display Area</i>	<i>6</i>
2.4.1.	<i>Data Display Format</i>	<i>7</i>
2.4.2.	<i>Data Save/Re-load options</i>	<i>7</i>
APPENDIX A.	HOW TO USE CAN FILTERS IN AU SAE J1939 DCS	11
A-1.	<i>No CAN filter enabled.....</i>	<i>11</i>
A-2.	<i>One CAN filter enabled, one parameter applied.....</i>	<i>11</i>
A-3.	<i>One CAN filter enabled, two parameters applied</i>	<i>12</i>
A-4.	<i>Two CAN filters enabled</i>	<i>13</i>
APPENDIX B.	HOW TO USE BLUETOOTH MODULE	14
APPENDIX C.	HOW TO INSTALL AU SAE J1939 DATA CENTER GUI.....	17



1. Au J1939 DCS Hardware

Au SAE J1939 Data Center System (DCS) is a system capable of capture, and display SAE J1939 data on a computer screen. Au J1939 DCS includes a handheld device and computer software with graphic user interface (GUI).

1.1. Major Hardware Features

Au J1939 DCS device (figure 1-1) is a handheld device with 2 LEDs, 1 push button, and 2 DB9 connectors (1 female connector on RS232 side, 1 male connector on BUS side). Major features of the device are listed below:

- Size: 3-1/8”L X 1-11/16”W X13/16” H (78mm X 42mm X 21mm)
- Enclosure Color: Black or PC white
- 1 push button
- 2 LED (Power, Communication)
- 1 RS232 Interface: for connection to PC
- 1 DB9 Bus connector: for CAN bus network connection and power supply
- Power supply: +12V DC, 250mA max



Figure 1-1

It can be connected to CAN / SAE J1939 network on the Bus side through a CAN cable (part #: CBL-CAN-01). The Pinout of the DB9 male “Bus” interface is illustrated in Figure 1-2.

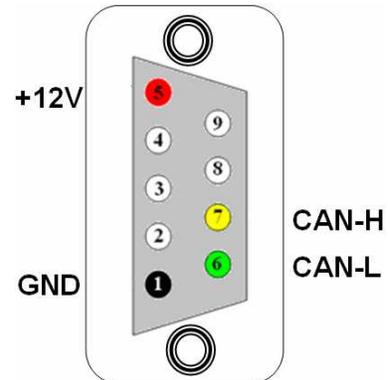


Figure 1-2

1.2. 3 ways of PC connection

Au J1939 DCS device has an RS232 interface. It can be connected to PC with one of the three ways, as shown in Figure 1 – 3:



Figure 1 – 3

1.2.1. It can be connected to the RS232 (serial) port of a PC through a RS232 serial extension cable (part#: CBL-RS232-01, order separately)



- 1.2.2. It can be connected to the USB port of a PC through a USB to RS232 converter cable (part#: CBL-USB-232, order separately).
- 1.2.3. With an optional build-in Bluetooth module, Au J1939 DCS device can be wireless connected to PC through Bluetooth module and PC Bluetooth dongle(order separately).

Note: Default Bluetooth pairing code is 1234.

Please refer to attachment B for detail information on how to use Bluetooth module.

A typical SAE J1939 -15 network topology with Au SAE J1939 DCS is illustrated in Figure 1 – 4.

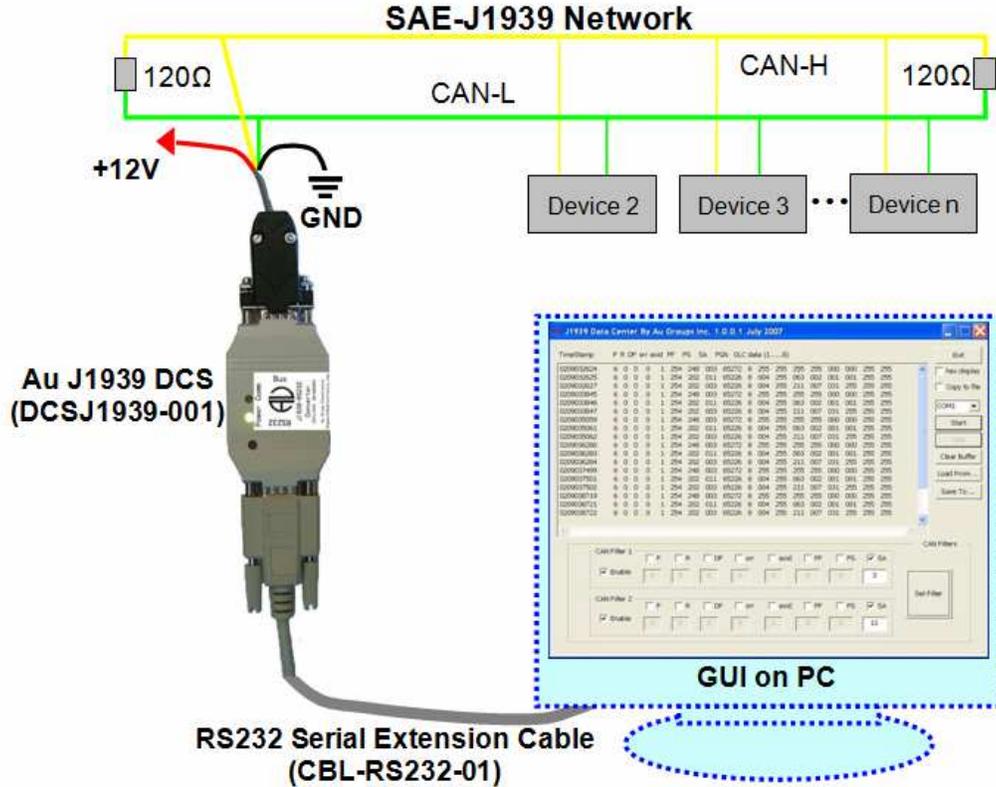


Figure 1-4 A typical SAE J1939 -15 network topology with Au J1939 DCS

All items for the DCS hardware connection and their Au Part# are listed in table 1-2.

Table 1-2 Hardware list and part # for Data center system

Au Part#	Accessories
DCSJ1939-001	Au SAE J1939 Data Center System without Bluetooth module
DCSJ1939-001B	Au SAE J1939 Data Center System with Bluetooth module
CBL-CAN-01	4-wire CAN cable for DB9 male BUS connector
CBL-RS232-01	RS232 Serial Extension Cable
CBL-USB-232	USB to RS232 Serial Convert Cable
CBL-CAN-03	CAN /J1939 Cable with DB9 Female Connector and 9-way Round Threaded Plug

2. Au J19393 DCS PC Software with GUI

A PC software with graphic user interface (GUI) is used to display the J1939 data on a CAN network (Figure 2 – 1).

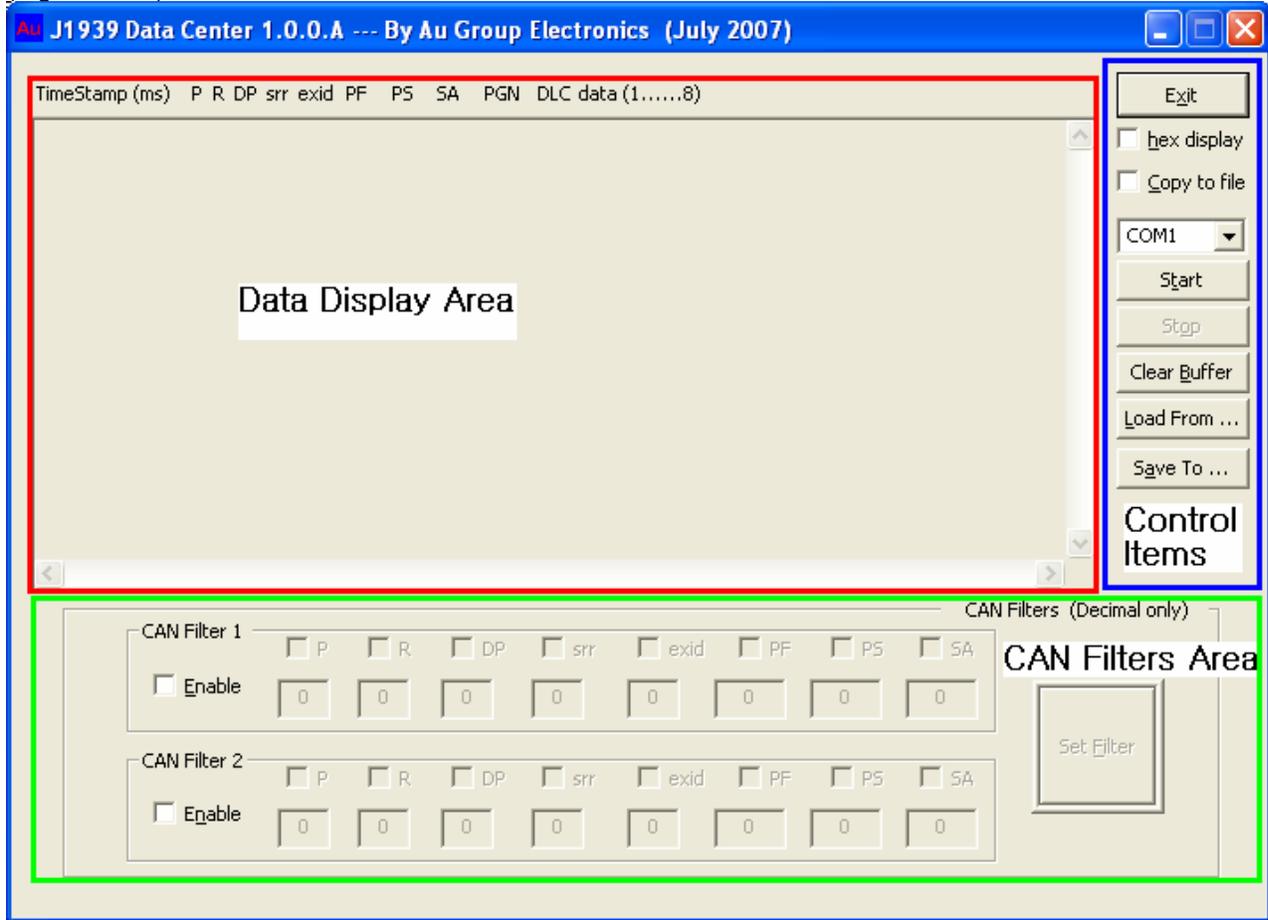


Figure 2-1 Au SAE-J1939 DCS PC software with GUI

2.1. Major Software Features

- Ease to Use: Capture and display SAE-J1939 message from CAN network without the requirement of decent J1939 knowledge/experience or very complicate configuration settings.
- 3 Function areas:
 - Control Item area
 - CAN Filter area
 - Data Display Area
- 2 CAN filters available
- Data could be displayed in hex format or decimal format
- Data could be saved either while receiving or after received
 - "Copy-to-file" mode saves data directly to hard drive.
 - "Save-to" mode saves data after received
- Saved data can be re-load from hard driver

2.2. Control Item Area

The Control Items area is located in the right upper corner, it includes 6 push buttons (Exit, Start, Stop, Clear Buffer, Load From..., Save To...), 2 check boxes (hex display, Copy to file), and 1 serial port dropdown list, as shown in figure 2-1.

The function of each control item is listed in table 2-1.

Table 2-1 Function of Control Items

Control Item	Function
Exit	Close GUI and exit the Au SAE J1939 Data Center System software
hex display	Display all data in hex code
Copy to file	Copy data to a dedicated file on hard drive while receiving
COM1	Select PC serial port to connect with Au SAE J1939 DCB-CAN
Start	Start to display captured SAE J1939 Data in Data Display area
Stop	Stop to display new captured SAE J1939 Data in Data Display area
Clear	Clear all data in the Data Display area
Load From...	Load hex file and show it in the Data Display area
Save to...	Save the data in the Data Display area into a dedicated file

2.3. CAN Filter Area

There are 2 CAN filters available in Au J1939 DCS. Each filter has 8 selective filter parameters: P, R, DP, srr, exid, PF, PS, and SA (defined by SAE J1939 protocol).

To enable a CAN filter, first, check one of the “Enable” check box, then check the desired option(s), enter the value of the filter, then click “Set Filter” icon (see appendix A for more details on how to set CAN filters)

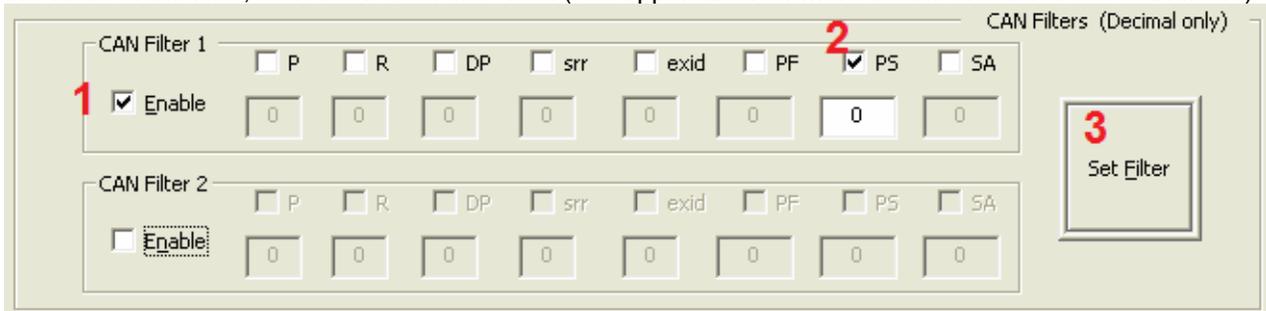


Figure 2 - 2

2.4. Data Display Area

Au SAE J1939 DCS is able to capture and display the following message of SAE J1939 data: Time stamp, priority, reserved, data page, substitutes remote request, extended identifier, PDU format, PDU specific, source address, parameter group number, data length, and data.

The captured data can be displayed in the Data Display Area, which is located in the upper right corner, as shown in figure 1-4.

The abbreviation, description, and example of each data are listed in table 1-4.

Table 1-4 Abbreviation and description for SAE J1939 Data

Abbreviations	Description	Example
Timestamp (ms)	Data received time in milliseconds	0007255045
P	Priority	3
R	Reserved	0
DP	Data Page	0
srr	Substitute Remote Request	0
exid	Extended Identifier	1
PF	PDU Format	240
PS	PDU Specific	002
SA	Source Address	003
PGN	Parameter Group Number	61442
DLC	Data Length Code	8
data (1...8)	Data Content of each byte	255 255 255 114 238 255 255 255



2.4.1. Data Display Format

The captured data can be displayed in either **hex format** or **decimal format**.

Hex Format: If the "hex display" in the Control Items area is checked, all data display in a hex format (figure 2-3).

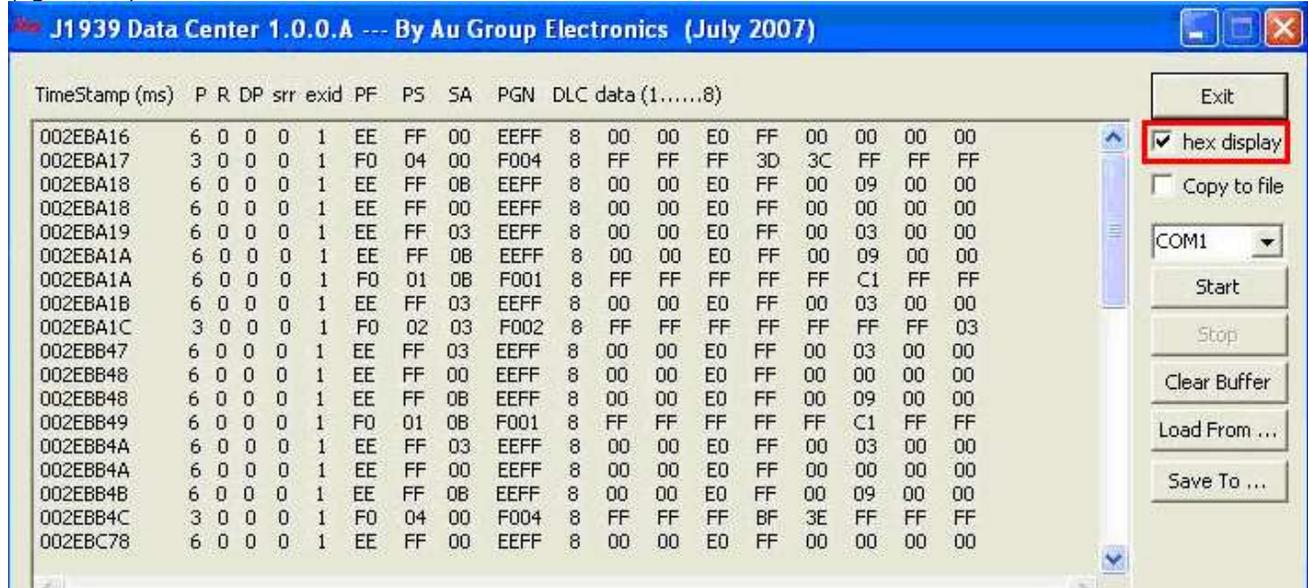


Figure 2-3 Data displayed in Hex format

Decimal Format: If the "hex display" in the Control Items area is unchecked, all data display in a decimal format (figure 1-7)

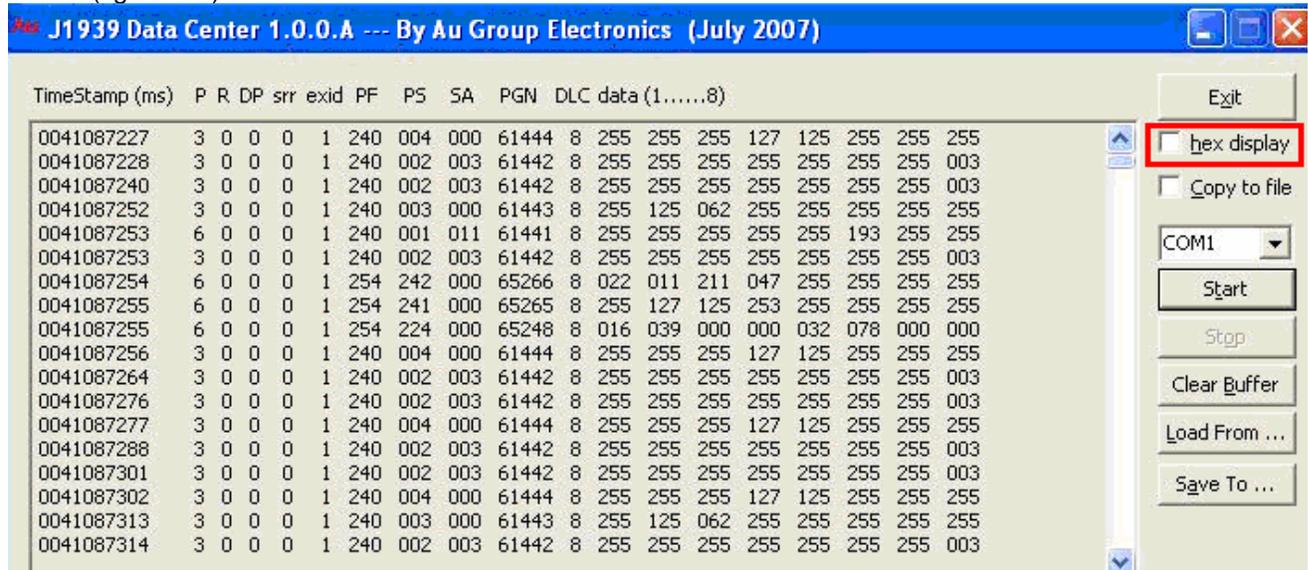


Figure 2-4 Data displayed in Decimal format

2.4.2. Data Save/Re-load options

Au SAE J1939 DCS has two approaches to save captured SAE J1939 data to files on computer hard drive, and all saved data file can be re-loaded into the Data Display Area:

- Copy data to hard drive while data is receiving– **Copy-to-File Function**
- Save received data to hard drive after finishing – **Save-to-File Function**
- Saved data can be re-loaded into Data Display Area – **Re-load Function**

2.4.2.1 Copy-to-File Function

→Check "Copy-to-file"(Figure 2-3)

→ "Save As" windows pop up (Figure 2-4)



Figure 2-3

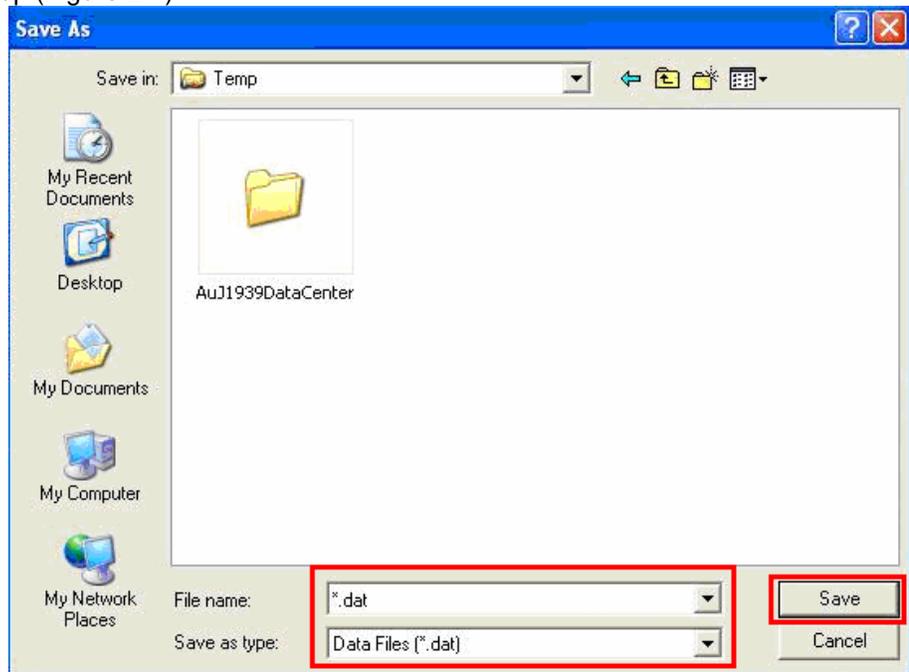


Figure 2-4

→ J1939 data can then be saved in *.dat file

→ Notice that when using "Copy-to-file", only the last line of received data will be displayed in the Data display area (Figure 2-5)

TimeStamp (ms)	P	R	DP	srr	exid	PF	PS	SA	PGN	DLC	data (1.....8)
006538A8	6	0	0	0	1	FE	FC	00	FEFC	8	FF 7D FF FF FF FF FF

Figure 2-5

→ The captured data stored in a dedicated data file, which can also be opened and edited by any text edit software, such as a excel program, a notepad program (Figure 2-6) etc.

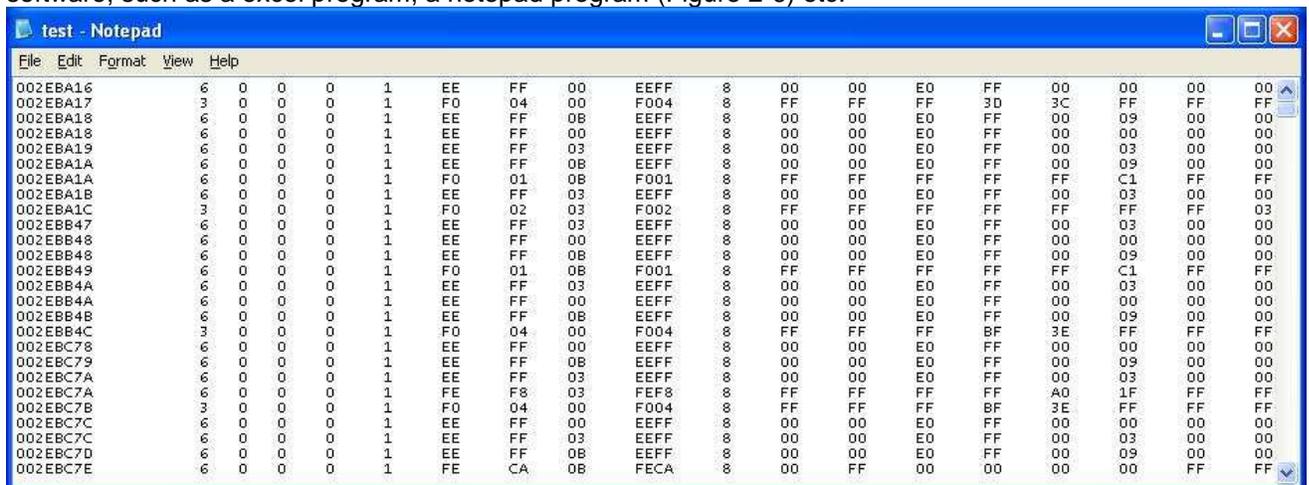


Figure 2-6

2.4.2.2 Save-to-File Function

- Click "Stop" button to stop data transferring
- "Save-to" button is active, click "Save-to" button (Figure 2-7)
- "Save As" window pop up (Figure 2-8)



Figure 2-7



Figure 2-8

→ Name the file, and click "Save" button, all data in the Data display area will be saved in a "*.dat" file

2.4.2.3 Re-load file

Saved data can be re-loaded from the hard driver, and displayed in the Data Display Area:

- Click "Load From..." button (Figure 2-9)
- "Open" window pops up, select "test.dat" file, then click "Open" button (Figure 2-10)



Figure 2-9

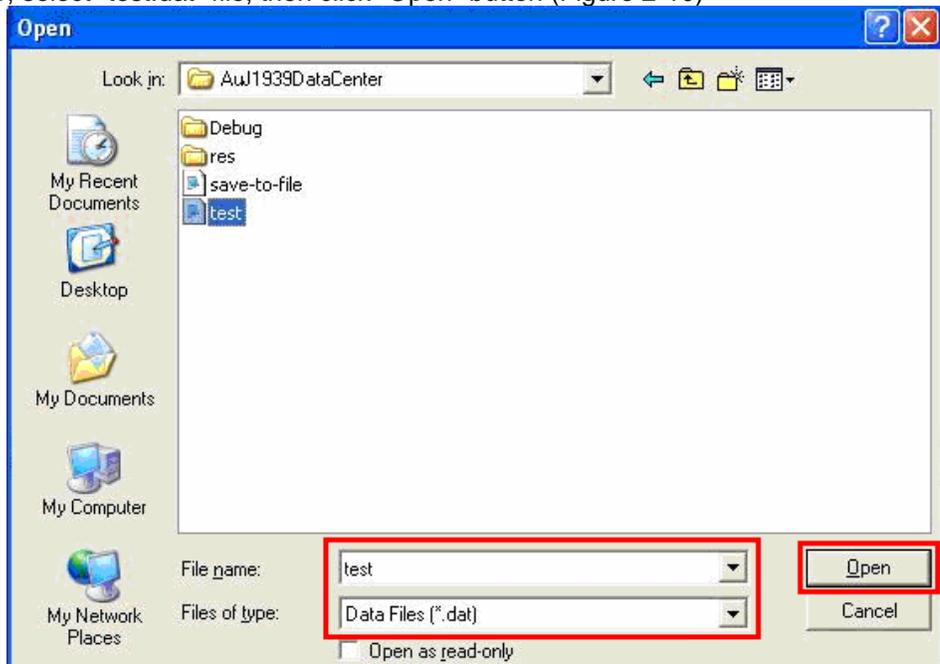


Figure 2-10

→ Data from the "test.dat" file displays in the Data Display Area (Figure 2-11)



TimeStamp (ms)	P	R	DP	srr	exid	PF	PS	SA	PGN	DLC	data (1.....8)							
0006633640	6	0	0	0	1	254	252	000	65276	8	255	125	255	255	255	255	255	255
0013548961	6	0	0	0	1	254	248	003	65272	8	255	255	255	255	216	021	255	255
0013548962	3	0	0	0	1	240	004	000	61444	8	255	255	255	166	037	255	255	255
0013548962	6	0	0	0	1	254	202	011	65226	8	000	255	000	000	000	000	255	255
0013548963	6	0	0	0	1	254	242	000	65266	8	083	003	089	014	255	255	255	255
0013548964	6	0	0	0	1	254	241	000	65265	8	255	166	037	252	255	255	255	255
0013548965	6	0	0	0	1	254	224	000	65248	8	184	011	000	000	112	023	000	000
0013548965	6	0	0	0	1	254	239	000	65263	8	255	255	255	037	255	255	255	255
0013548966	6	0	0	0	1	238	255	003	60928	8	000	000	224	255	000	003	000	000
0013548967	6	0	0	0	1	238	255	011	60928	8	000	000	224	255	000	009	000	000
0013548967	6	0	0	0	1	238	255	000	60928	8	000	000	224	255	000	000	000	000
0013548968	6	0	0	0	1	254	246	000	65270	8	255	037	030	255	255	255	255	255
0013548969	6	0	0	0	1	254	247	000	65271	8	255	255	255	255	112	000	112	000
0013548970	6	0	0	0	1	238	255	003	60928	8	000	000	224	255	000	003	000	000
0013548970	6	0	0	0	1	238	255	000	60928	8	000	000	224	255	000	000	000	000
0013548971	6	0	0	0	1	238	255	011	60928	8	000	000	224	255	000	009	000	000

Figure 2-11



Appendix A. How to use CAN Filters in Au SAE J1939 DCS

A few examples are given here to illustrate how to use the CAN filters in Au SAE J1939 DCS.

A-1. No CAN filter enabled

In the CAN Filter area, neither of the CAN Filter "Enable" check boxes checked, which means no CAN filter applied, in this case, all data from a SAE J1939 network will be displayed in the Data Display area, as shown in figure A-1.

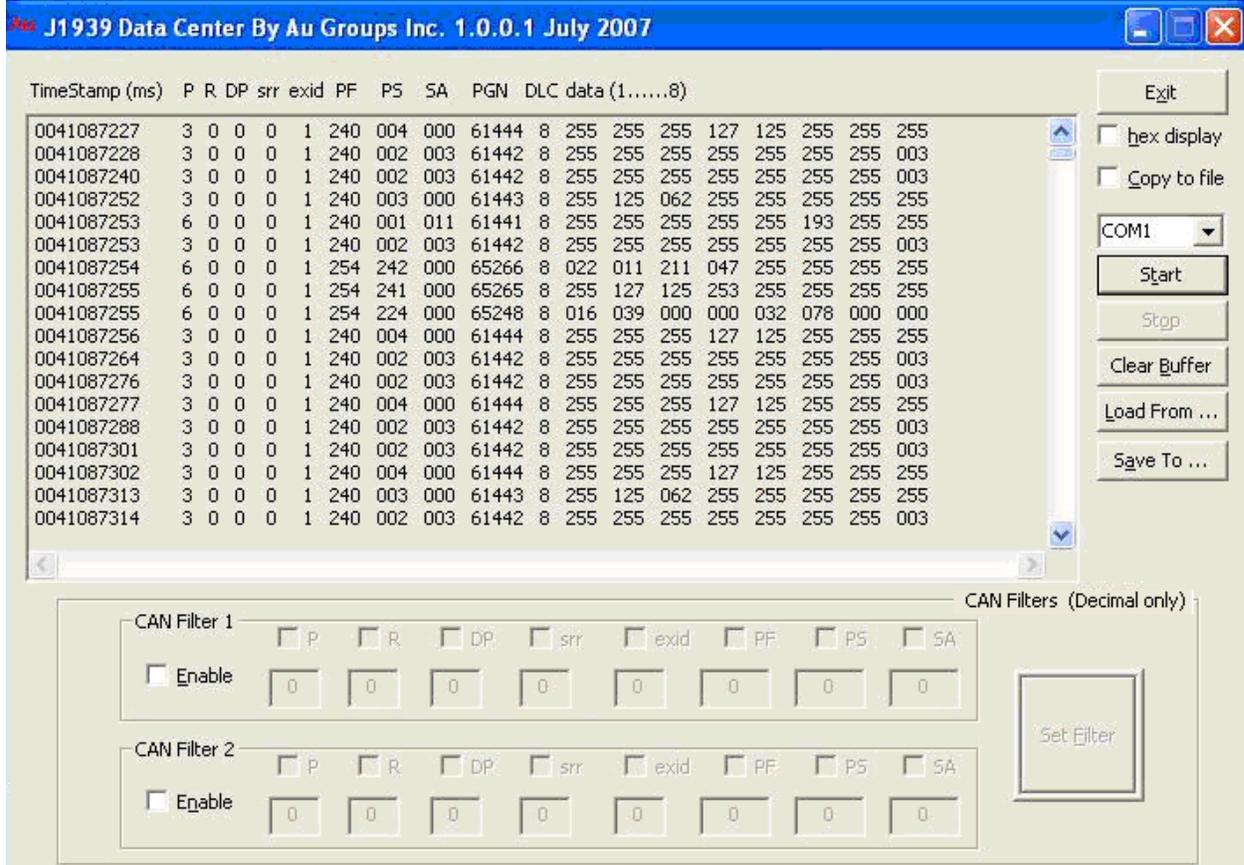


Figure A-1 No CAN filter enabled

A-2. One CAN filter enabled, one parameter applied

This example shows the steps of enable one CAN filter and one parameter in this filter (SA=3 (Transmission))

Step 1. In CAN Filter area: Check Enable for CAN Filter 1 → check SA → set SA=3 → click "Set Filter" button (figure A-2).

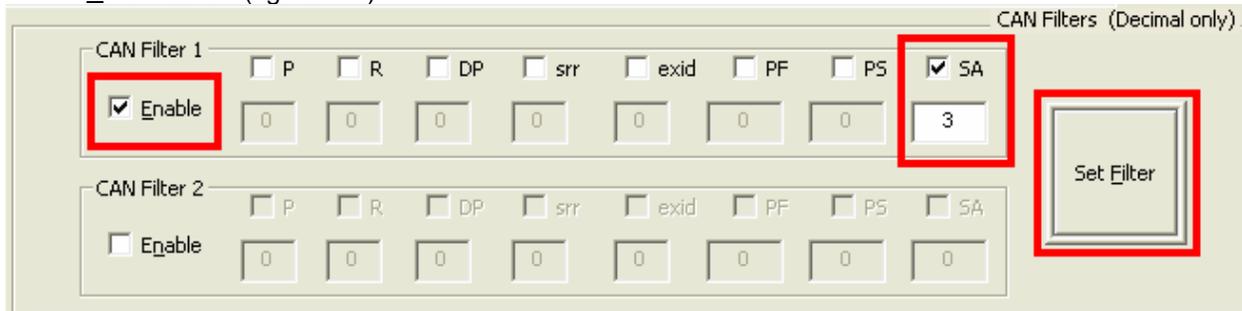


Figure A-2 Enable CAN Filter 1, display data with SA=3

Step 2. In Control area: Click "Clear Buffer" to clear the display area → click "Start" button to start display data (figure A-3)

Notice that in the Data Display area, only data with SA=003 (which is the transmission) displayed, as shown in figure A-4.



Figure A-3

TimeStamp (ms)	P	R	DP	srr	exid	PF	PS	SA	PGN	DLC data (1.....8)
0018159936	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018159948	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018159961	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018159972	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018159984	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018159997	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018160009	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018160022	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018160033	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018160046	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018160058	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018160071	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018160083	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018160095	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018160106	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018160120	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018160131	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003
0018160143	3	0	0	0	1	240	002	003	61442	8 255 255 255 255 255 255 003

Figure A-4

Only Data with SA=003 will be displayed when CAN filter 1 set

A-3. One CAN filter enabled, two parameters applied

- Step 1. In CAN Filter area,
 - a. check Enable for CAN Filter 1 → check PF, set PF=254 → check PS, set PS=242
 - b. click "Set Filter" button
- Step 2. In Control area,
 - a. click "Clear Buffer" to clear the display area
 - b. click "Start" button to start display data

Notice that in the Data Display area, all data showing PF = 254, PS =242, PGN=65266 (figure A-5)

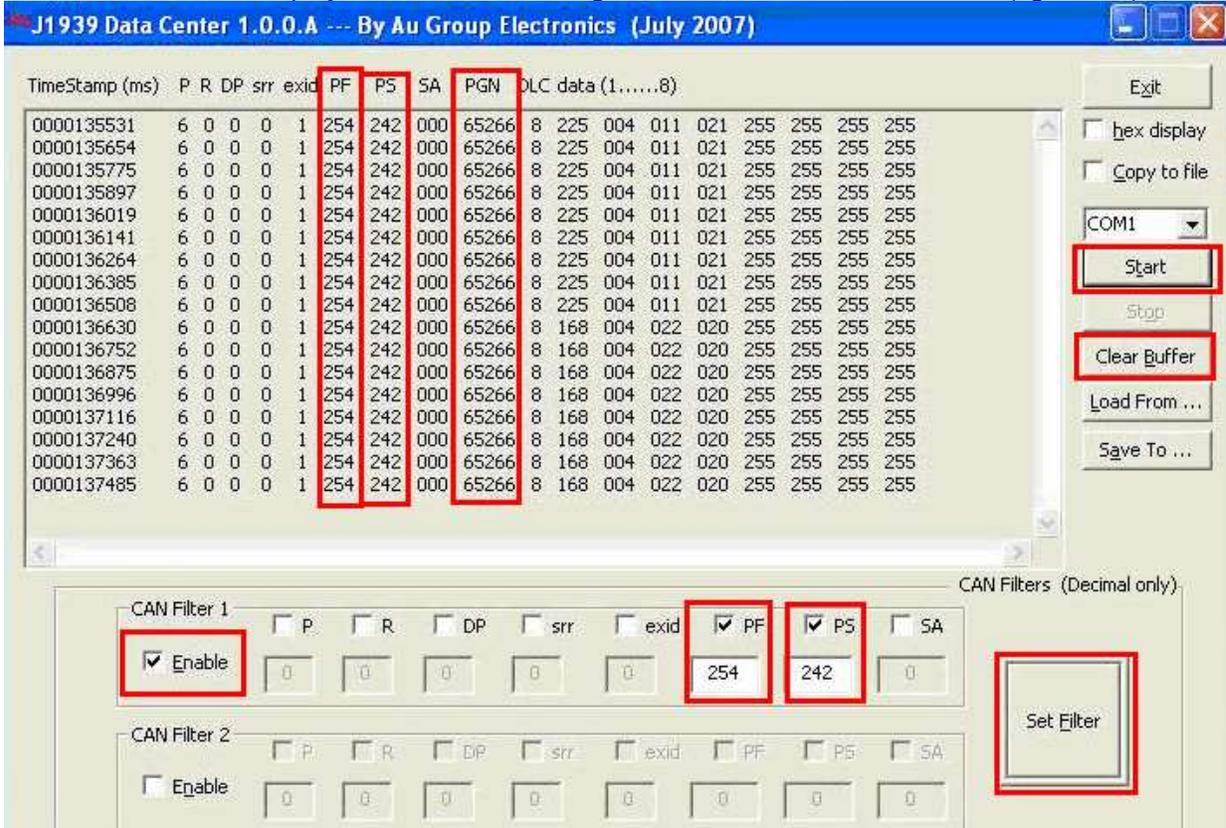


Figure A-5

One CAN Filter apply PGN=65266 (PF=254, PS=242)



A-4. Two CAN filters enabled

- Step 1. In CAN Filter area,
- check Enable for CAN Filter 1 → check PF, set PF=254 → check PS, set PS=241
 - check Enable for CAN Filter 2 → check PF, set PF=240 → check PS, set PS=001
 - click "Set Filter" button

Step 2. In Control area: Click "Clear Buffer" → click "Start" button to start display data

Notice that in the Data Display area, as shown in figure A-6, all displayed data are either with PF = 254, PS =241, PGN=65265 (Cruise Control) or PF =240, PS = 001, PGN=61441(Electronic Brake Controller 1)

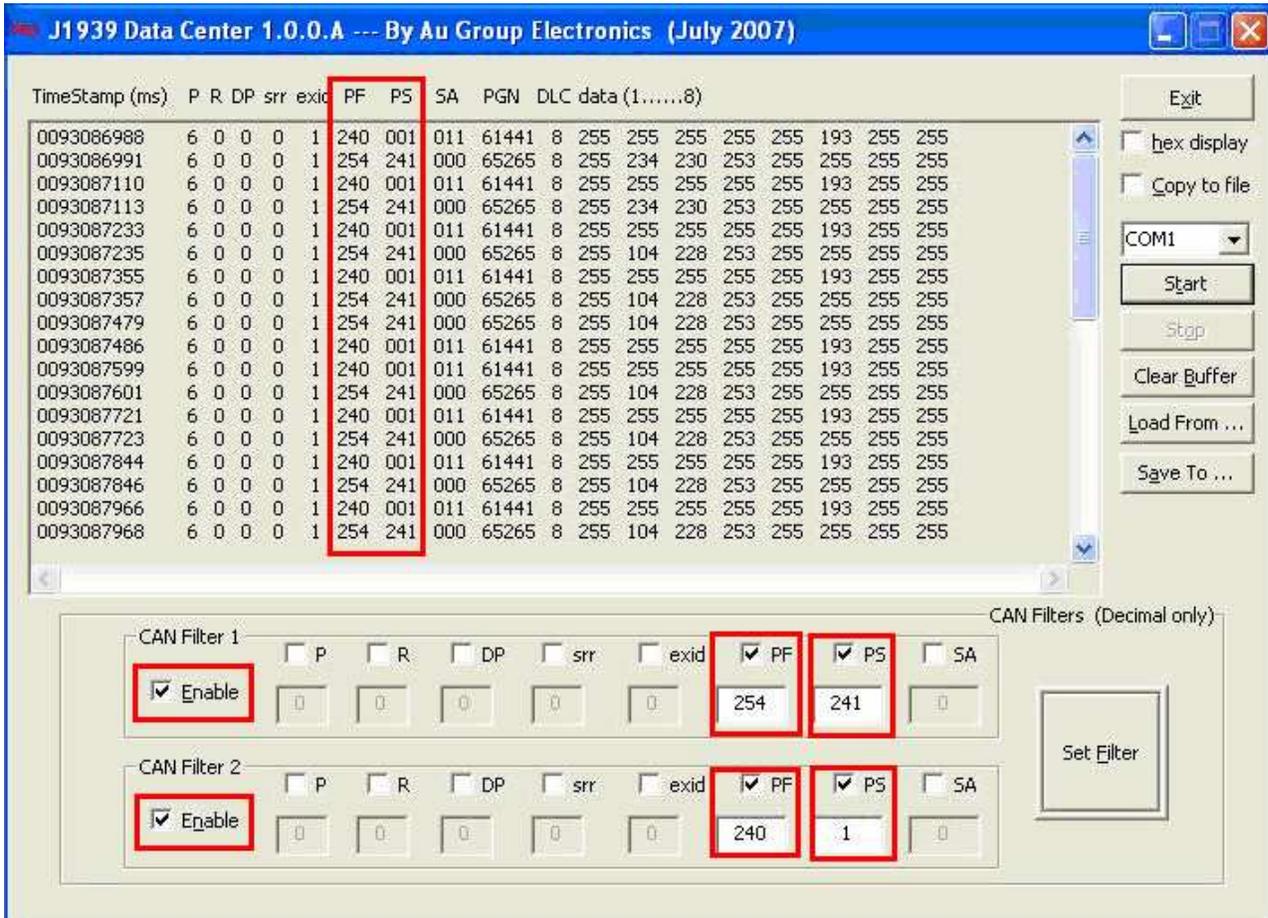


Figure A-6 Two CAN Filters Enabled

Appendix B. How to Use Bluetooth Module

B-1. Plug PC Bluetooth dongle to USB port.

B-2. Double click Bluetooth device icon

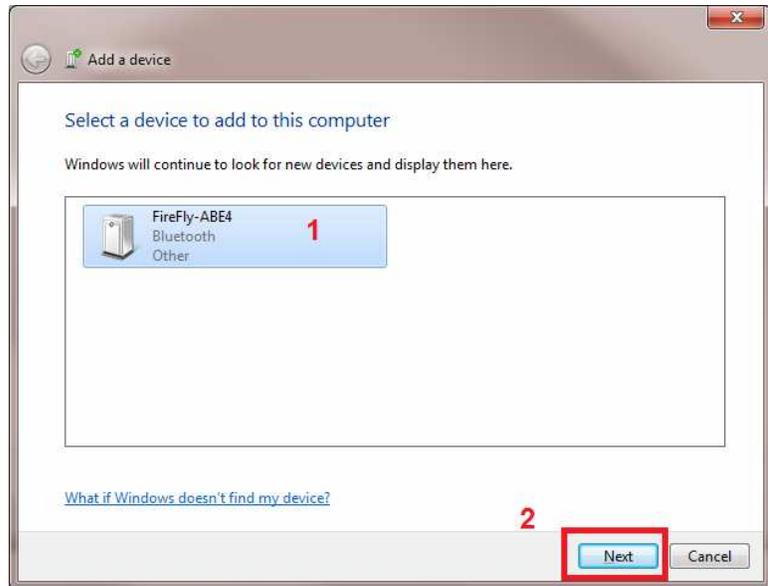
 to open a “Add a device” window

→Click “Add a device” tab to add a wireless device to this computer

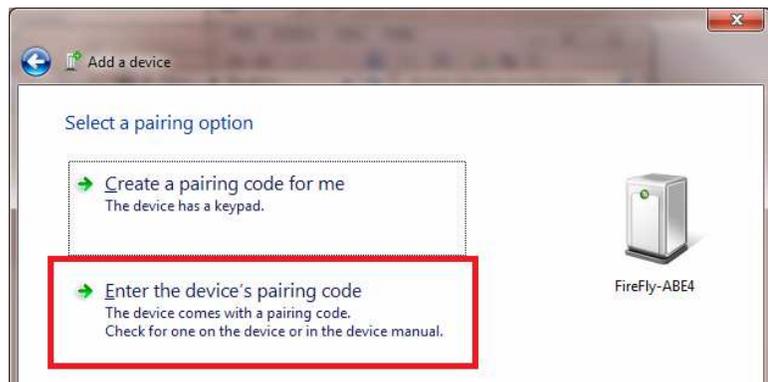


B-3. Windows will look for new device and display it, select the device.

→Click “Next”

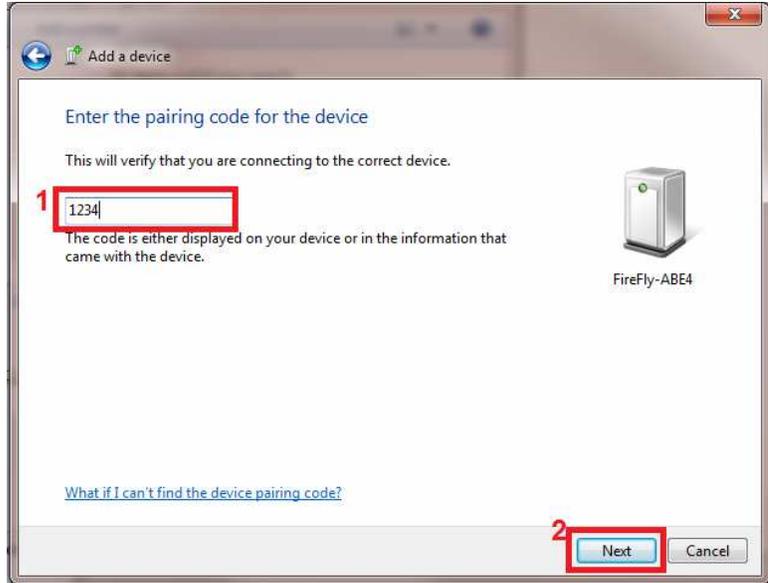


B-4. Select the 2nd pairing option: “Enter the device paring code”

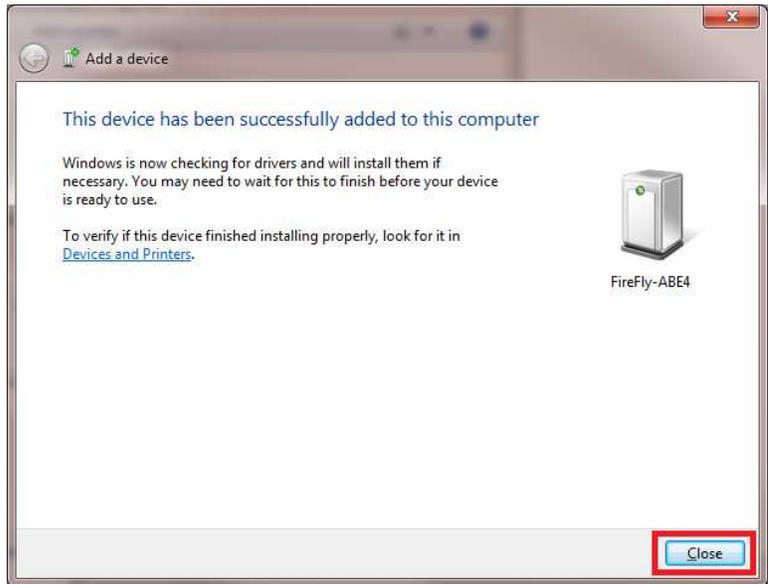




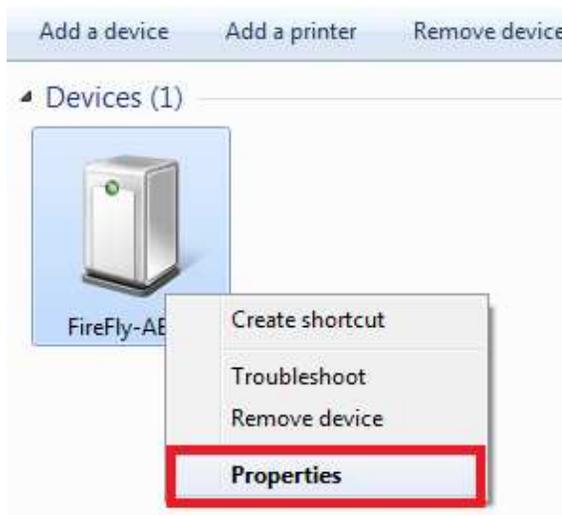
B-5.
Enter the default pairing code “1234”,
→Click “Next”.



B-6.
Close the window and wait for the
installation to finish before the device
is ready to use.



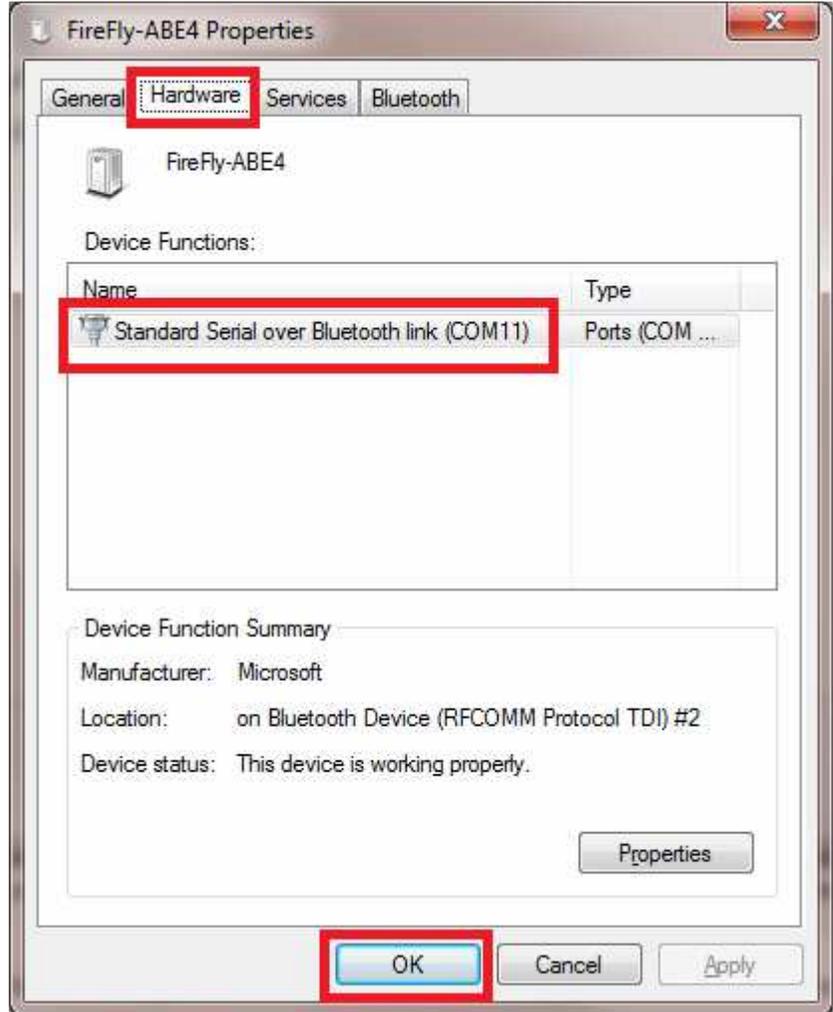
B-7.
Right click the icon of installed
device, select “Property” from the
drop-down list





B-8.

In the device properties window, select "Hardware" tab, the name and COM # will be seen. It is COM11 in this example.



B-9.

Click OK to close the window.

B-10. The wireless communication between Au J1939 Data Center and PC is set up and ready to use



Appendix C. How to install Au SAE J1939 Data Center GUI

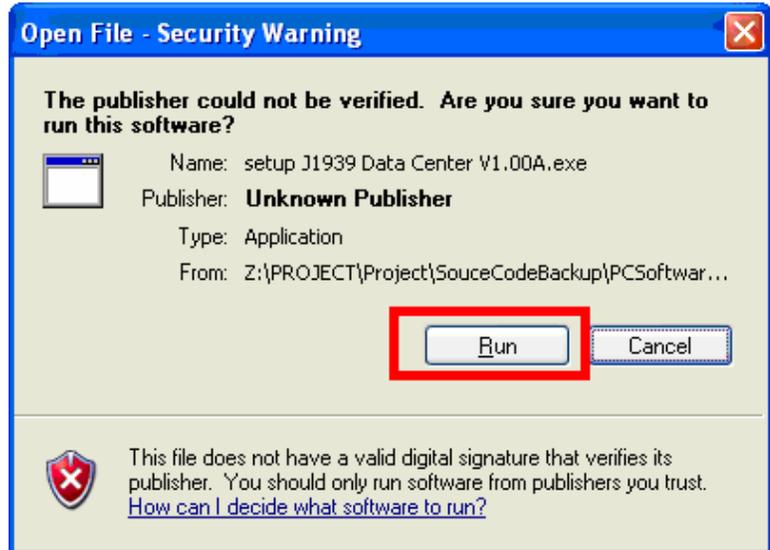
C- 1.

Double click Au Group Electronics provided application file “Setup J1939 Data Center V1.00A” to start installation.



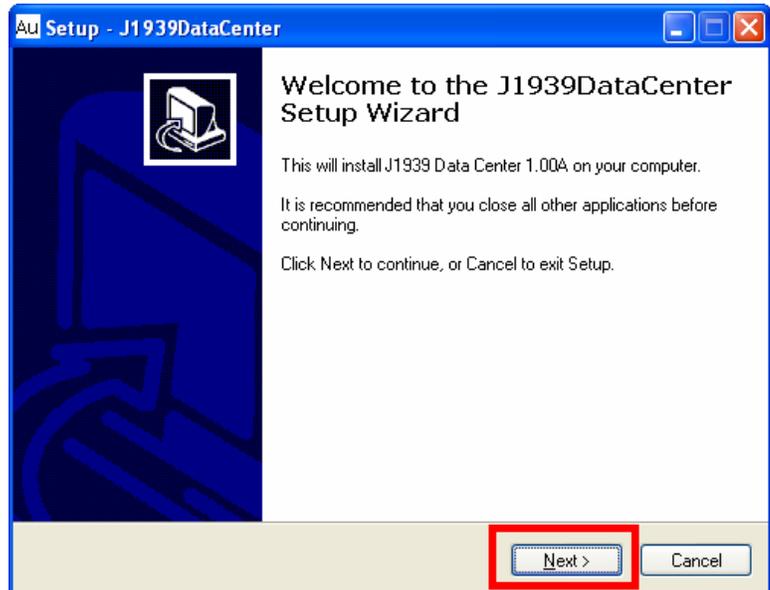
C- 2.

“Open File –Security Warning” window pops up
→Click “Run”



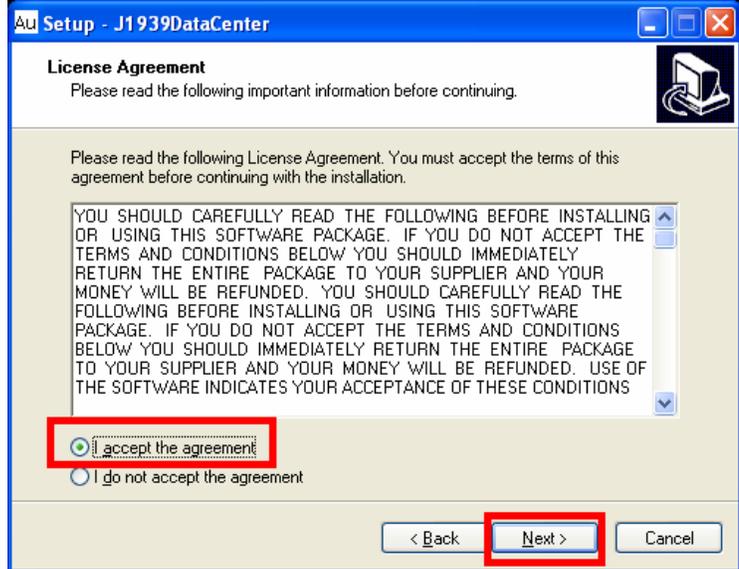
C- 3.

“Welcome to the J1939 Data Center Setup Wizard” pops up,
→Click “Next”.

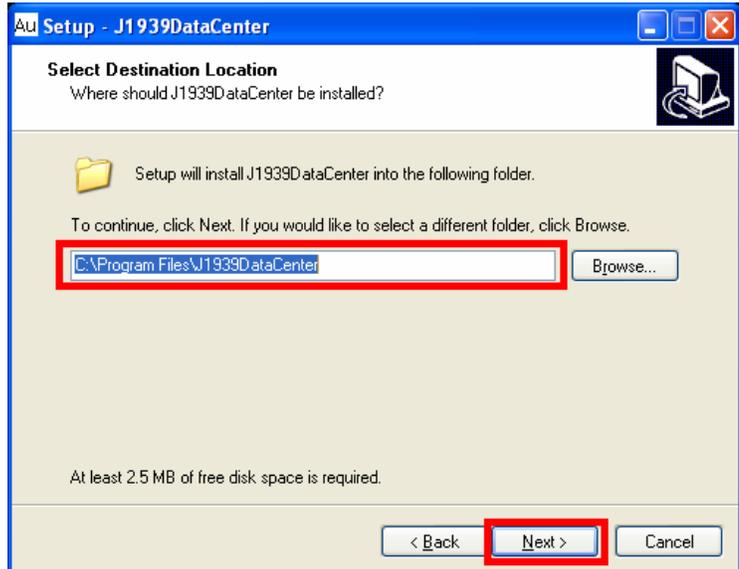




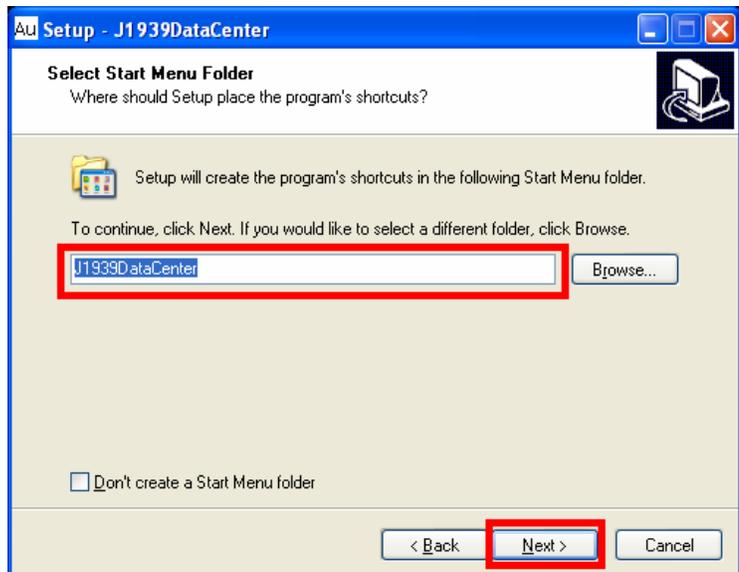
- C- 4.
Select "I accept the agreement"
"License Agreement" window
→ Click "Next" to continue.



- C- 5.
Select Destination Location,
→ Click "Next".

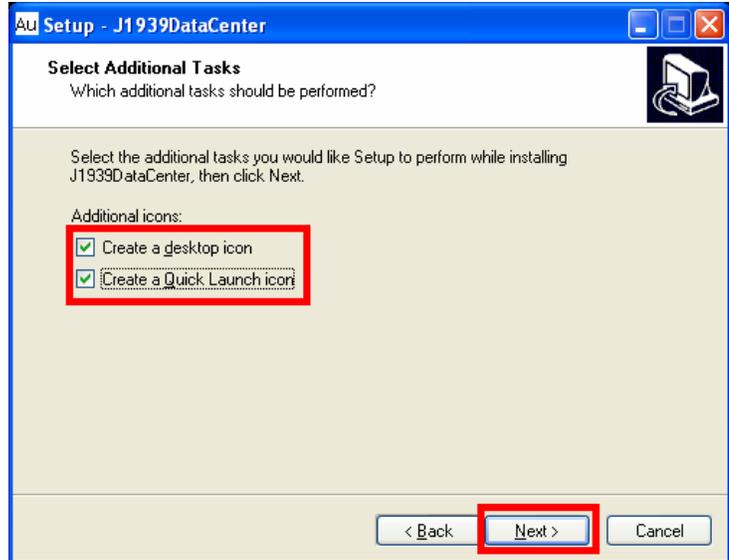


- C- 6.
Name "J1939DataCenter" as the Start
Menu Folder to place the program's
shortcut
→ Click "Next".

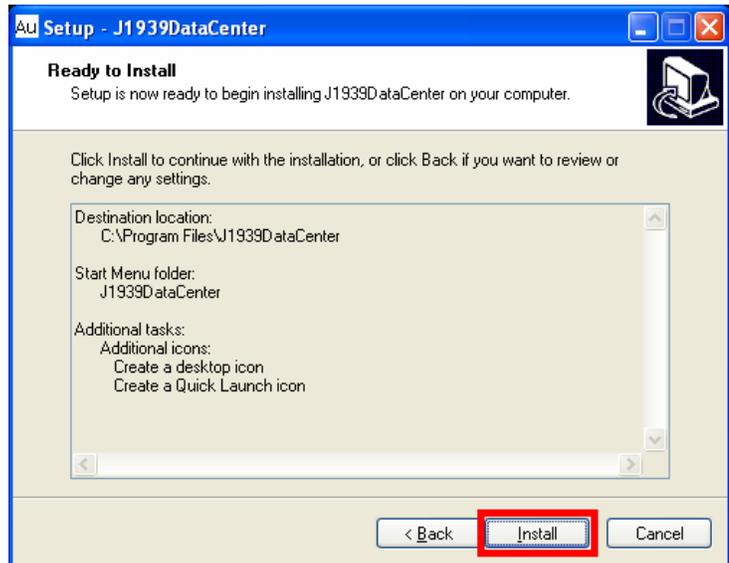




- C- 7.
Create additional icons: desktop icon
and a quick launch icon
→ Click “Next”



- C- 8.
Setup is ready, click “Install”.



- C- 9.
Setup has finished installation J1939
Data Center on your computer.
→ Check “Launch J1939 Data Center”
→ Click “Finish” to exit Setup.

