

# OBDII J1708/J1587 Simulator

## Features:

- Support the total 8 protocols., Customer can choose any 2 protocols or any 5 protocols or all 8 protocols in different cost
  1. ISO14230-4 (KWP2000) Fast Init
  2. ISO14230-4 (KWP2000) Baud 5 Init
  3. ISO9141-2
  4. SAE J1850 PWM
  5. SAE J1850 VPW
  6. ISO 15765-4 CAN 250/500 kbps 11 bit
  7. ISO 15765-4 CAN 250/500 kbps 29 bit
  8. J1708/J1587
- Supports three virtual ECUs: ECM, TCM, and ABS
- DTC Button and MIL LED output
- Freeze Frame handling
- On-the-fly protocol switching
- Monitor the vehicle bus traffic and give the debug information via RS32 of PC
- 3 knobs to give the 3 adjustable PIDs value: vehicle speed, Engine speed and Coolant Temperature
- J1979 Mode 1, 2, 3, 4, 7, 9
- VIN# can be specified by customer before shipping

## Product Specification

- Power supply : +12DC(range: +10V to 14V) regulated
- Working current : Less than 200mA at 12VDC Power supply. Maximum Output current of 12V DC in the OBDii DB9 and OBDII J1708/J1587 DB15 is the maximum current of 12VDC input power supply minus 0.2Amp
- Working temperature : 0 ~70

## 1 Get started

Step 1: Please see the Fig.1

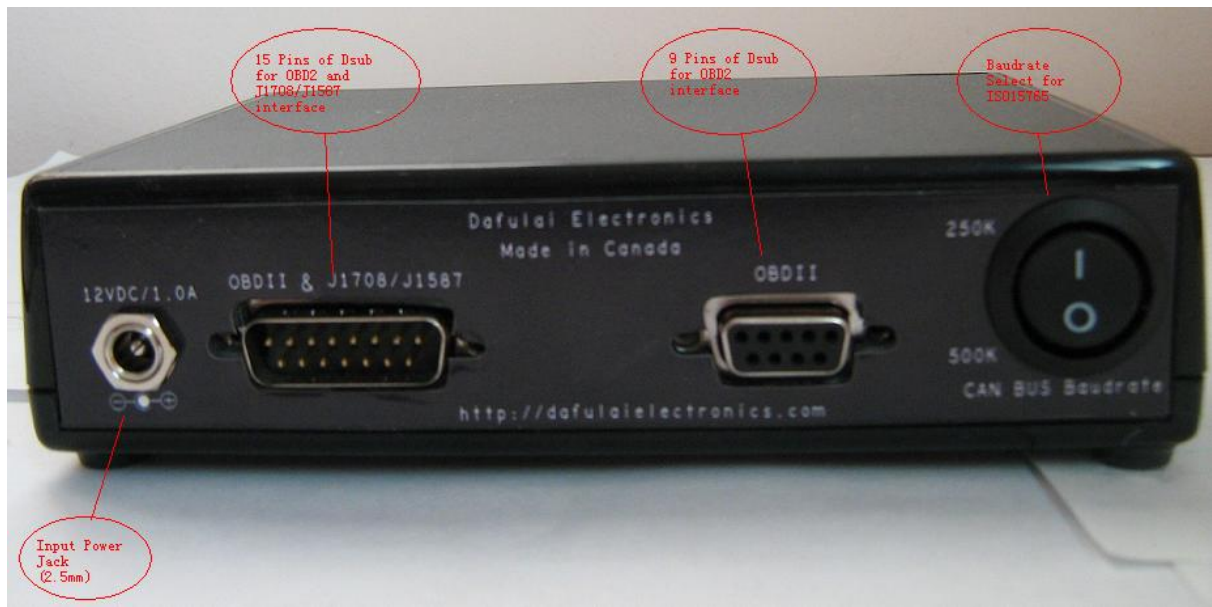


Fig.1 Rear panel of Simulator

Please connect OBD2 tester to 9 pins's db9 interface, or connect OBD2/J1708/J1587 tester to 15 pins' DB15 interface, or use DB9-J1962 cable (Part number: DFL-J1962 ) plug in to DB9, and then plug the OBD2 tester into J1962 connector. See Fig 2. If you want to use ISO15765 protocol, please press the rear switch to select correct CAN BUS baud rate.

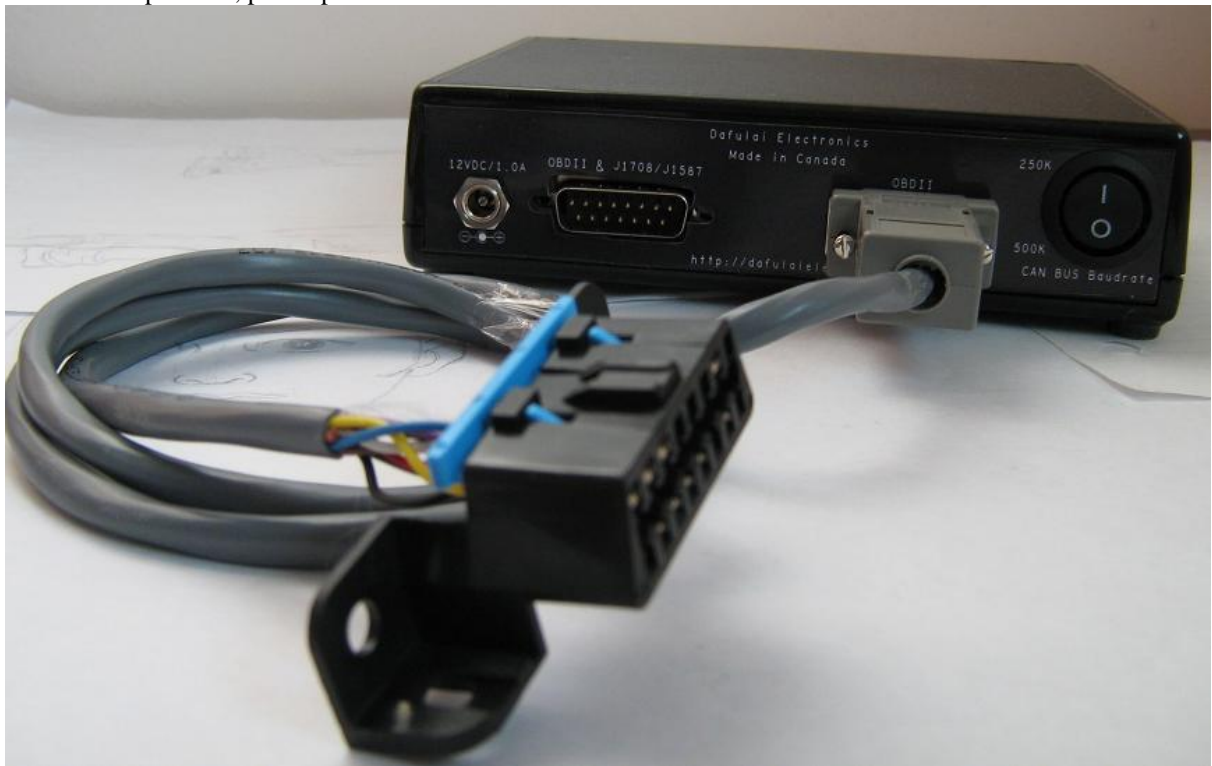


Fig.2 Rear panel with J1962 Female connector plug in

If you order our Deutsch connector cable (Part Number:DFLDC15CV1 ), you can plug th cable to DB15 and then plug the OBD2 tester into Deutsch socket. Please see figure below:



Of course, you can connect our J1939 Simulator to this cable too. But If you use J1939 Protocols, you **cannot** select "ISO15765" protocol from this OBD2/J1708/J1939 Simulator. In the same way, if you select "ISO15765" protocol from this OBD2/J1708/J1939 Simulator, you **must unplug** "J1939 Simulator" because both "J1939" and "ISO15765" use low layer's "CAN BUS" protocol, it could cause "data collision". Please see figure below:



Step2: See Fig. 3. Connect DB9 of front panel to PC's COM port using DB9 cross-over (pin2 and pin3) female to female serial cable. Open the hyper-terminal in PC, and set up the COM port as 57600 baud rate, 8 bits of data, 1 stop bit, no parity bit, no flow control.

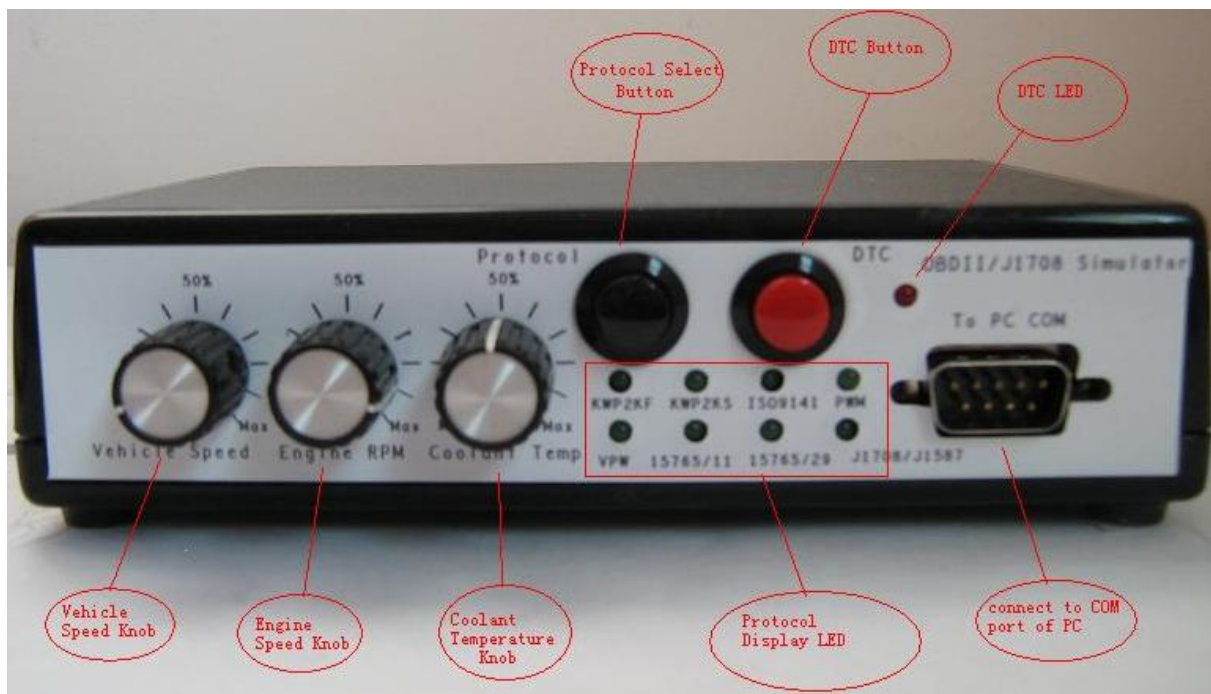


Fig. 3 Front panel of Simulator

- Step3: Plug in 12VDC/1.0A power in to Jack of rear panel. The power supply must be 12VDC /1.0A (0.5A is OK , but the output current of OBD2 DB9 or DB15 will be less than 0.3A). The power jack is 2.5mm I.D. and 5.5mm O.D. The power adaptor needs be purchased by customer itself. The power adaptor Mfg number is EPSA120100U-P6P-EJ, Digikey number is T1063-P6P-ND. Customers can choose other power adaptor too, but it needs to be regulated.
- Step 4: You will see one LED light on in the "Protocol Display LED"area of front panel to indicate which protocol it is. At the same time, you will see the information below in the hyper-terminal:

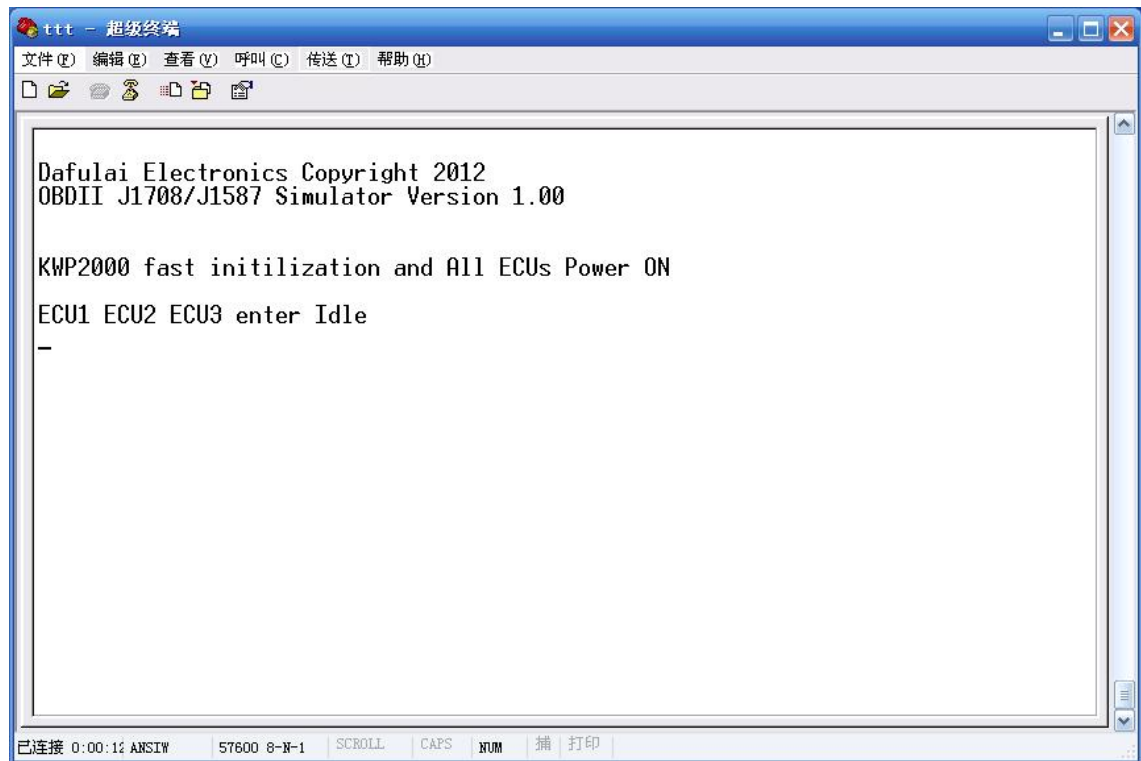


Fig. 4 Hyper-terminal Display

You can choose the different protocol by pressing and releasing "Protocol select button", the related LED light on in the "Protocol Display LED" area of front panel. And after 2.1 seconds, the simulator will really start to use the protocol you choose. If you press and hold the "Protocol select button" more than 2 seconds, protocol will be changed continuously at the rate of 4 times every second and the corresponding protocol LED lights on. When you see the protocol LED you expect light on, you release the "Protocol select button", and you will get the protocol you want, and after 2.1 seconds, the simulator will really start to use the protocol you choose.

The simulator has the function of remembering the protocol you use. The simulator will use the previous protocol when power on.

Step5: You can adjust the 3 knobs in the front panel to change the Vehicle speed, engine speed and coolant temperature. You will see the corresponding protocol LED blink if your tester communication with the simulator successfully within every 5 seconds. Fig.5 is the example of KWP2000 fast.



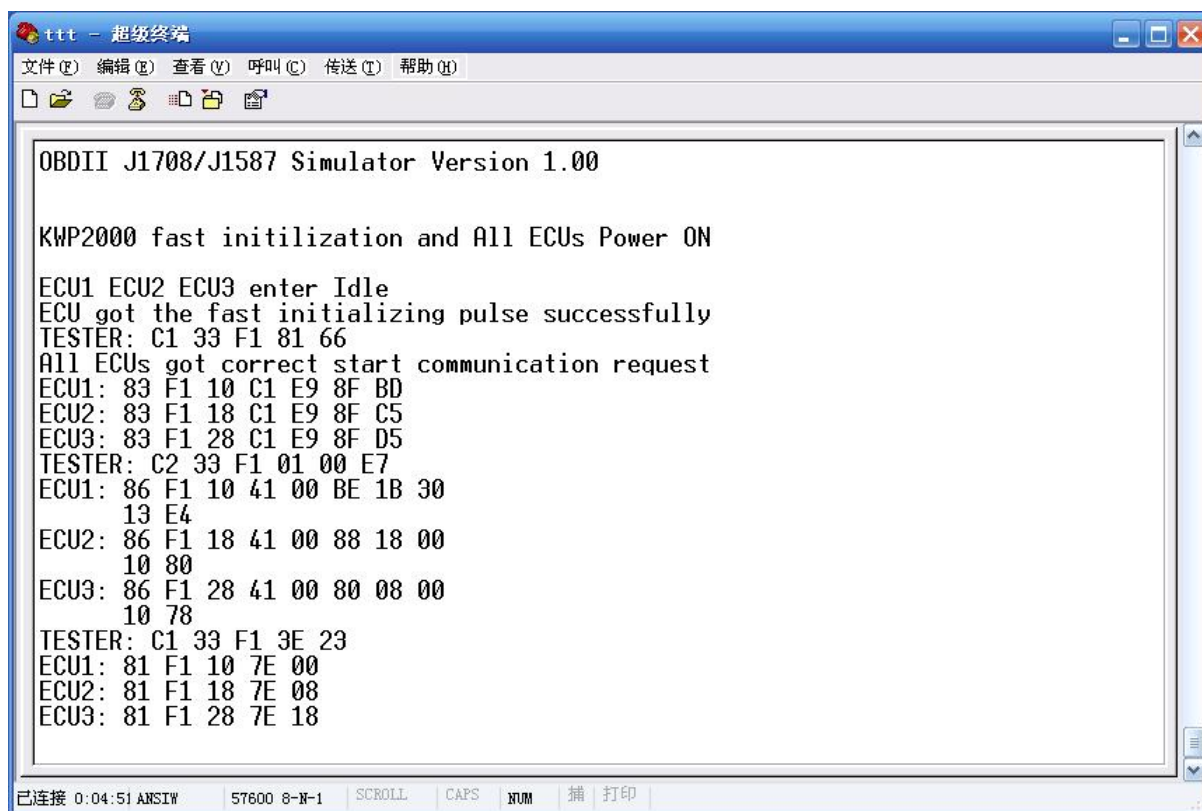


Fig.5 Hyper-terminal Display for KWP2000 FAST

**Notes:**1 The current of tester connected to DB9 or DB15 or J1962 cannot be over the allowable maximum current. Otherwise, the fuse inside the simulator maybe blows. And it will make the simulator malfunction. For 12VDC/1.0A power supply, the maximum current will be 0.8Amp.

2. Make sure the pinout of tester match the pinout of DB9 or DB15 below

3. OBDII DB9 (female) Pinout:

| Pin number | Signal         | Pin number | Signal     |
|------------|----------------|------------|------------|
| 1          | Signal Ground  | 6          | J1850 BUS- |
| 2          | Chassis Ground | 7          | J1850 BUS+ |
| 3          | CAN High       | 8          | L          |
| 4          | K              | 9          | +12VDC     |
| 5          | CAN Low        |            |            |

4. OBDII J1708/J1587 DB15 (male) Pinout:

| Pin number | Signal         | Pin number | Signal      |
|------------|----------------|------------|-------------|
| 1          | K              | 9          | +12VDC      |
| 2          | N/A            | 10         | L           |
| 3          | N/A            | 11         | N/A         |
| 4          | J1850 BUS-     | 12         | CAN Low     |
| 5          | J1850 BUS+     | 13         | CAN High    |
| 6          | Signal Ground  | 14         | J1708 BUS - |
| 7          | Chassis Ground | 15         | J1708 BUS + |
| 8          | +12VDC         |            |             |

## 2. Function

OBDII & J1708/J1587 Simulator can simulate ECM ( engine ECU) , TCM ( transmission control ECU ) and ABS ECU simultaneously.

## 2.1 OBDII

For ISO14230-4 (KWP2000) Fast Init, ISO14230-4 (KWP2000) Baud 5 Init, ISO9141-2, SAE J1850 PWM, and SAE J1850 VPW, ECU1 (ECM) address is 0x10, ECU2 (TCM) address is 0x18, ECU3 (ABS) address is 0x28. Tester address is 0xF1. The Key Word of ISO14230-4 is that KW1=0xE9 KW2=0x8F. And the Key Word of ISO9141-2 is that KW1=0x08 KW2=0x08

For ISO 15765-4 CAN 250/500 kbps 11 bit, the CAN BUS ID of tester is 0x7DF for function address request, 0x7E0 for physical address request to ECU1, 0x7E1 for physical address request to ECU2, and 0x7E2 for physical address request to ECU3. At the same time, the CAN BUS ID of ECU1 is 0x7E8 for response to tester, the CAN BUS ID of ECU2 is 0x7E9 for response to tester, and the CAN BUS ID of ECU3 is 0x7EA for response to tester.

For ISO 15765-4 CAN 250/500 kbps 29 bit, the tester address is 0xF1, ECU1's physical address is 0x10, ECU2's physical address is 0x18, ECU3's physical address is 0x28, and all ECUs' function address is 0x33.

The corresponding protocol LED will blink when the tester communicate with any ECU successfully within 5 seconds.

The supported mode and PID are shown below:

### ECU1 (ECM)

#### Mode 1

| PID  | Description                               | Fixed Raw Value         | Variable Raw Value                                     |
|------|-------------------------------------------|-------------------------|--------------------------------------------------------|
| 0x00 | Supported PID information                 | 0xBE 0x1B 0x30 0x13     |                                                        |
| 0x01 | Monitor status since DTCs cleared         |                         | After DTC button pressed.<br>before DTC button pressed |
| 0x03 | Fuel System Status                        | 0x0000                  |                                                        |
| 0x04 | Calculated LOAD Value                     | 0x3C (Decimal: 60)      |                                                        |
| 0x05 | Engine Coolant Temperature                |                         | 0x00 to 0xff (pot given)                               |
| 0x06 | Short Term Fuel Trim - Bank 1             | 0x41 (Decimal: 65)      |                                                        |
| 0x07 | Long Term Fuel Trim - Bank 1              | 0x4B (Decimal: 75)      |                                                        |
| 0x0C | Engine RPM                                |                         | 0x0000 to 0xffff (pot given)                           |
| 0x0D | Vehicle Speed Sensor                      |                         | 0x00 to 0xff (pot given)                               |
| 0x0F | Intake Air Temperature                    | 0x32 (Decimal: 50)      |                                                        |
| 0x10 | Air Flow Rate from MAF Sensor             | 0x8000 (Decimal: 32768) |                                                        |
| 0x13 | Location of Oxygen Sensors                | 0x01                    |                                                        |
| 0x14 | Oxygen Sensor Output Voltage              | 0x5A (Decimal: 90)      |                                                        |
| 0x1C | OBD Type                                  | 0x01 (OBDII)            |                                                        |
| 0x1F | Time Since Engine Start                   |                         | 2 Bytes ( real time calculation)                       |
| 0x20 | Supported PID information                 | 0x80 0x02 0x20 0x01     |                                                        |
| 0x21 | Distance Travelled While MIL is Activated |                         | 2 Bytes ( real time calculation)                       |
| 0x2F | Fuel Level Input                          | 0xC8 (Decimal: 200)     |                                                        |
| 0x33 | Barometric Pressure                       | 0x6E (Decimal: 110)     |                                                        |
| 0x40 | Supported PID                             | 0x44 0x00 0x00 0x00     |                                                        |

|      |                         |                         |  |
|------|-------------------------|-------------------------|--|
|      | information             |                         |  |
| 0x42 | Control module voltage  | 0x2EE0 (Decimal: 12000) |  |
| 0x46 | Ambient air temperature | 0x4B (Decimal: 75)      |  |

**Mode 2**

P0100 will cause a freeze frame when DTC button pressed and released. And MIL LED will be light. It only supports the frame number 0.

| PID  | Description                                        | Fixed Raw Value        | Variable Raw Value                                                       |
|------|----------------------------------------------------|------------------------|--------------------------------------------------------------------------|
| 0x02 | DTC that caused required freeze frame data storage |                        | P0100 when DTC has been pressed<br>0x0000 when no fault or Fault cleared |
| 0x05 | Engine Coolant Temperature                         | 0x3F (Decimal: 63)     |                                                                          |
| 0x0C | Engine RPM                                         | 0x05DC (Decimal: 1500) |                                                                          |
| 0x0D | Vehicle Speed Sensor                               | 0x50 (Decimal: 80)     |                                                                          |
| 0x14 | Oxygen Sensor Output Voltage                       | 0x5F (Decimal: 95)     |                                                                          |

**Mode 3**

If DTC button is pressed once or more, 4 DTCs from ECU1 will be generated, and MIL LED will be light. When requesting the mode, you can get 4 DTCs from ECU1 in this situation. The 4 DTCs from ECU1 are P0100, U0100, B0200 and C0301

**Mode 4**

Delete all DTCs and freeze frame datum. MIL LED will be dark.

**Mode 7**

If MIL LED is light, you will get 4 DTCs from ECU1 when requesting this mode. The 4 DTCs from ECU1 are P0168, P0207, P0307, and P0261

**Mode 9**

Info type 1 and Info type 2 are supported. If you request VIN number, the ECU1 will respond in the following information:

Default VIN# =DAFULA1ELECTRONIC (Total : 17 characters) .

**ECU2 (TCM)****Mode 1**

| PID  | Description                       | Fixed Raw Value     | Variable Raw Value                                     |
|------|-----------------------------------|---------------------|--------------------------------------------------------|
| 0x00 | Supported PID information         | 0x88 0x18 0x00 0x10 |                                                        |
| 0x01 | Monitor status since DTCs cleared |                     | After DTC button pressed.<br>before DTC button pressed |
| 0x05 | Engine Coolant Temperature        |                     | 0x00 to 0xff (pot given)                               |
| 0x0C | Engine RPM                        |                     | 0x00 to 0xff (pot given)                               |
| 0x0D | Vehicle Speed Sensor              |                     | 0x00 to 0xff (pot given)                               |
| 0x1C | OBD Type                          | 0x01 (OBDII)        |                                                        |

**Mode 2**

Not supported



**Mode 3**

If MIL LED is light, you will get 1 DTC from ECU2 when requesting this mode. The DTC from ECU2 is P0700

**Mode 4**

Delete the DTC and MIL LED will be dark.

**Mode 7**

If MIL LED is light, you will get 1 DTC from ECU2 when requesting this mode. The DTC from ECU1 is P0707

**Mode 9**

Not supported

**ECU3 (ABS)****Mode 1**

| PID  | Description                       | Fixed Raw Value     | Variable Raw Value                                     |
|------|-----------------------------------|---------------------|--------------------------------------------------------|
| 0x00 | Supported PID information         | 0x80 0x08 0x00 0x10 |                                                        |
| 0x01 | Monitor status since DTCs cleared |                     | After DTC button pressed.<br>before DTC button pressed |
| 0x0D | Vehicle Speed Sensor              |                     | 0x00 to 0xff (pot given)                               |
| 0x1C | OBD Type                          | 0x01 (OBDII)        |                                                        |

**Mode 2**

Not supported

**Mode 3**

If MIL LED is light, you will get 1 DTC from ECU3 when requesting this mode. The DTC from ECU3 is B2100

**Mode 4**

Delete the DTC and MIL LED will be dark.

**Mode 7**

If MIL LED is light, you will get 1 DTC from ECU3 when requesting this mode. The DTC from ECU3 is B2245

**Mode 9**

Not supported

**2.2 J1708/J1587**

For J1708/J1587, ECU1 (ECM) message ID is 0x80 (Decimal 128), ECU2 (TCM) message ID is 0x82 (Decimal 130), ECU3 (ABS) message ID is 0x89 (Decimal 137).

**ECU1 (ECM)**

| PID | Description                        | Transmission Update Period | Fixed Raw Value     | Variable Raw Value       |
|-----|------------------------------------|----------------------------|---------------------|--------------------------|
| 38  | Second Fuel Level (Right Side)     | 10 S                       | 0x52 (Decimal: 82)  |                          |
| 51  | Throttle Position                  | 0.2S                       | 0x96 (Decimal: 150) |                          |
| 84  | Road Speed                         | 0.1S                       |                     | 0x00 to 0xff (pot given) |
| 89  | Power Takeoff Status               | 1S                         | 0xD1 (Decimal: 209) |                          |
| 91  | Percent Accelerator Pedal Position | 0.1S                       | 0x7D (Decimal: 125) |                          |

|     |                                                               |                                                     |                                                                                                                                                                                                                                                                                         |                                                                                          |
|-----|---------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| 92  | Percent Engine Load                                           | 0.1S                                                | 0x78 (Decimal: 120)                                                                                                                                                                                                                                                                     |                                                                                          |
| 96  | Fuel Level                                                    | 10S                                                 | 0x76 (Decimal: 118)                                                                                                                                                                                                                                                                     |                                                                                          |
| 98  | Engine Oil Level                                              | 10S                                                 | 0x7A (Decimal: 122)                                                                                                                                                                                                                                                                     |                                                                                          |
| 100 | Engine Oil Pressure                                           | 1S                                                  | 0x46 (Decimal: 70) for normal state.<br>0x14 (Decimal: 20) for low oil pressure detection fault                                                                                                                                                                                         |                                                                                          |
| 105 | Intake Manifold Temperature                                   | 1S                                                  | 0x55 (Decimal: 85)                                                                                                                                                                                                                                                                      |                                                                                          |
| 110 | Engine Coolant Temperature                                    | 1S                                                  |                                                                                                                                                                                                                                                                                         | 0x00 to 0xff (pot given)                                                                 |
| 158 | Battery Voltage—Switched                                      | On Request                                          | 0x1E0 (Decimal: 480)                                                                                                                                                                                                                                                                    |                                                                                          |
| 183 | Fuel Rate (Instantaneous)                                     | 0.2S                                                | 0x1F40 (Decimal: 8000)                                                                                                                                                                                                                                                                  |                                                                                          |
| 184 | Instantaneous Fuel Economy                                    | 0.2S                                                | 0x7D00 (Decimal: 32000)                                                                                                                                                                                                                                                                 |                                                                                          |
| 190 | Engine Speed                                                  | 0.1S                                                |                                                                                                                                                                                                                                                                                         | 0x00 to 0xffff (pot given)                                                               |
| 192 | Multisection Parameter                                        | Depends on transmitted long parameter               |                                                                                                                                                                                                                                                                                         |                                                                                          |
| 194 | Transmitter System Diagnostic Code and Occurrence Count Table | once automatically when state changed or On Request | PID of standard diagnostic code is 100 and Diagnostic code character is 33 when "DTC"key pressed once. (low oil pressure detection)<br><br>PID of standard diagnostic code is 100 and Diagnostic code character is 35 when "DTC"key pressed more than once. (Oil pressure sensor fails) |                                                                                          |
| 196 | Diagnostic Data/Count Clear Response                          | As needed                                           |                                                                                                                                                                                                                                                                                         | Only support the most significant 2 bit of Diagnostic code character is binary 01 or 10  |
| 237 | Vehicle Identification Number                                 | On Request                                          | DAFULAIELECTRONIC                                                                                                                                                                                                                                                                       | We can change it once before shipping                                                    |
| 243 | Component Identification Parameter                            | On Request                                          | Transmit by PID 192, Its value is 00401*DAFULAIELECTRONICS*001                                                                                                                                                                                                                          |                                                                                          |
| 244 | Trip Distance                                                 | 10S                                                 |                                                                                                                                                                                                                                                                                         | Calculate on real-time                                                                   |
| 245 | Total Vehicle Distance                                        | 10S                                                 |                                                                                                                                                                                                                                                                                         | Calculate on real-time, And the initial value is 200,000km when turning on the simulator |
| 247 | Total Engine Hours                                            | On Request                                          |                                                                                                                                                                                                                                                                                         | Calculate on real-time                                                                   |

**ECU2 (TCM)**

| PID | Description                    | Transmission Update Period | Fixed Raw Value     | Variable Raw Value       |
|-----|--------------------------------|----------------------------|---------------------|--------------------------|
| 37  | Transmission Tank Air Pressure | 1 S                        | 0x26 (Decimal: 38)  |                          |
| 64  | Direction Switch Status        | On Request                 | 0xD0 (Decimal: 208) |                          |
| 124 | Transmission Oil Level         | 10S                        | 0xA0 (Decimal: 160) | 0x00 to 0xff (pot given) |
| 127 | Transmission Oil Pressure      | 1S                         | 0x34 (Decimal: 52)  |                          |

**ECU3 (ABS)**

| PID | Description                 | Transmission Update Period | Fixed Raw Value    | Variable Raw Value |
|-----|-----------------------------|----------------------------|--------------------|--------------------|
| 49  | ABS Control Status          | 0.5 S                      | 0x14 (Decimal: 20) |                    |
| 209 | ABS Control Status, Trailer | 0.5 S                      | 0x40 (Decimal: 64) |                    |

**TESTER**

| PID | Description                         | Transmission Update Period | Fixed Raw Value | Variable Raw Value                                                                      |
|-----|-------------------------------------|----------------------------|-----------------|-----------------------------------------------------------------------------------------|
| 0   | Request Parameter                   | As needed                  |                 | Parameter ID of the Requested parameter                                                 |
| 195 | Diagnostic Data Request/Clear Count | As needed                  |                 | Only support the most significant 2 bit of Diagnostic code character is binary 01 or 10 |

**Notes:** 1 For broadcast , if the the periods of broadcast is shorter than 10 seconds once, then the display periods on the hyper-terminal of PC will be 5 seconds  
2 The simulator cannot accept the data packet from tester with multiple PID=0. For the request data packet from tester, the simulator accept only one request for one request data packet.

**3 Mechanical dimension**

The size of simulator is 4.2" X 6.1" X 1.5"

**IMPORTANT NOTICE**

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