DFL168A .net Component

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1 Features Highlights

- Simply use our .NET Component of DFL168A , you will easily get vehicle Data in the Microsoft .net framework environment
- Don't need to know OBD2 and J1939/J1708/J1587 protocol, don't need to read DFL168A data sheet, just need to know DFL168A pinout, so easily get vehicle parameters values in real time.
- Support .Net framework 3.5 or Higher, Support Windows XP, Windows 7,Windows 8, Windows 8.1, Windows 10

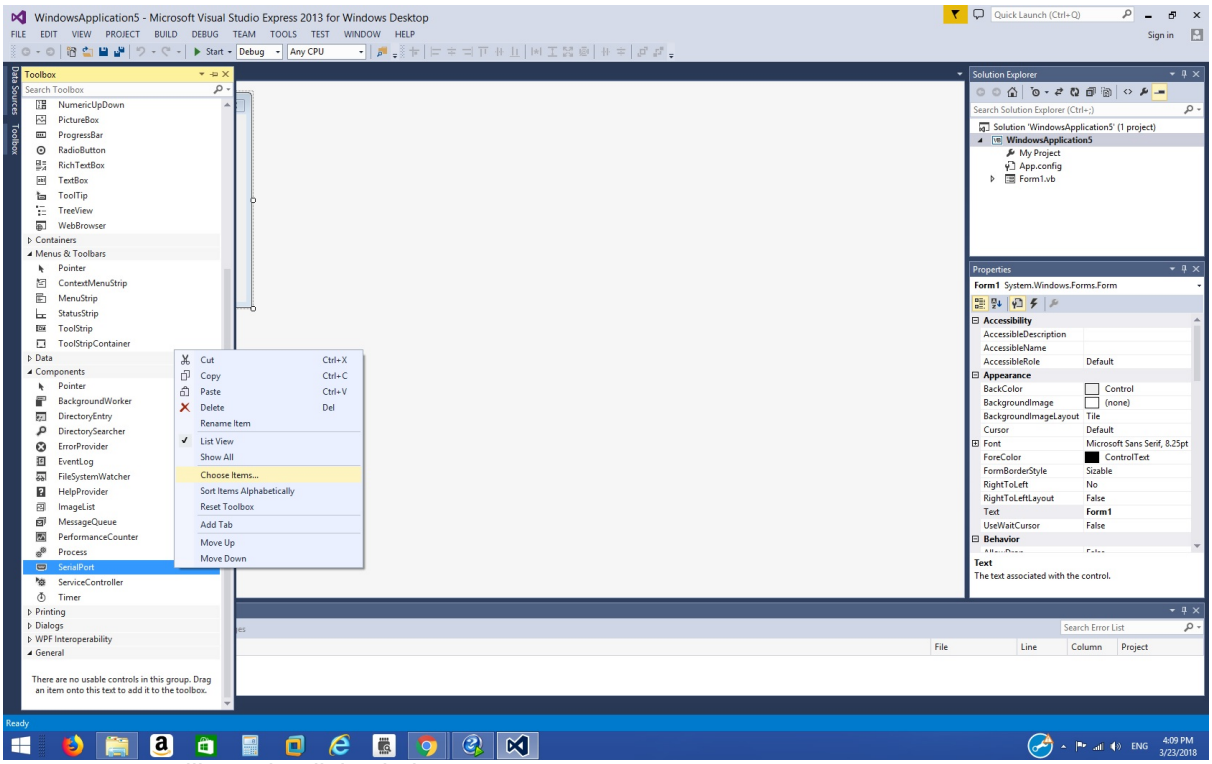
2 How to install DFL168A Component?

Install Library steps:

Step1: Download the component file : DFL168A.dll (http://dafulaielectronics.com/DFL168A.dll)

Step2: Run Microsoft Visual Studio or Visual studio community.

In the Components of toolbox, right click mouser, click "choose items...."



You will see the dialog below:

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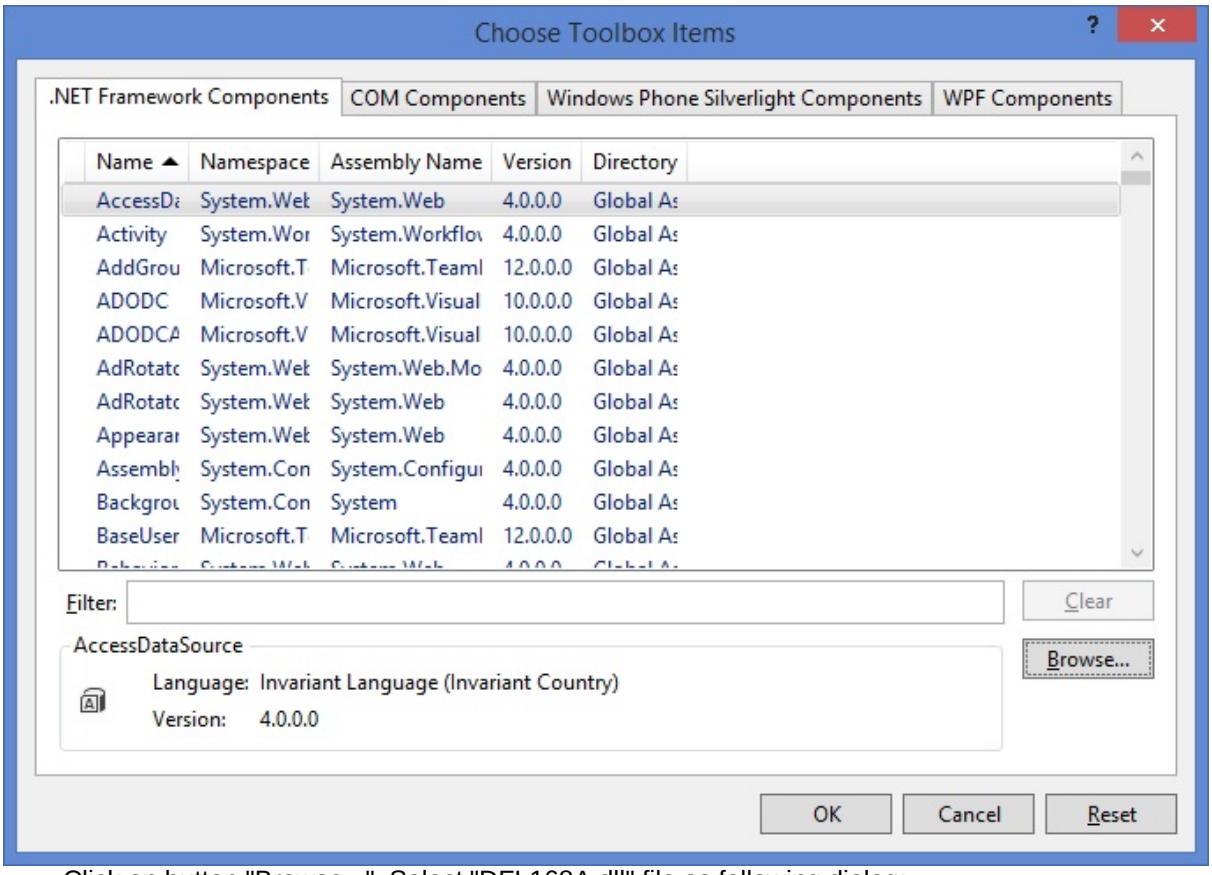

Click on button "Browse...", Select "DFL168A.dll" file as following dialog:

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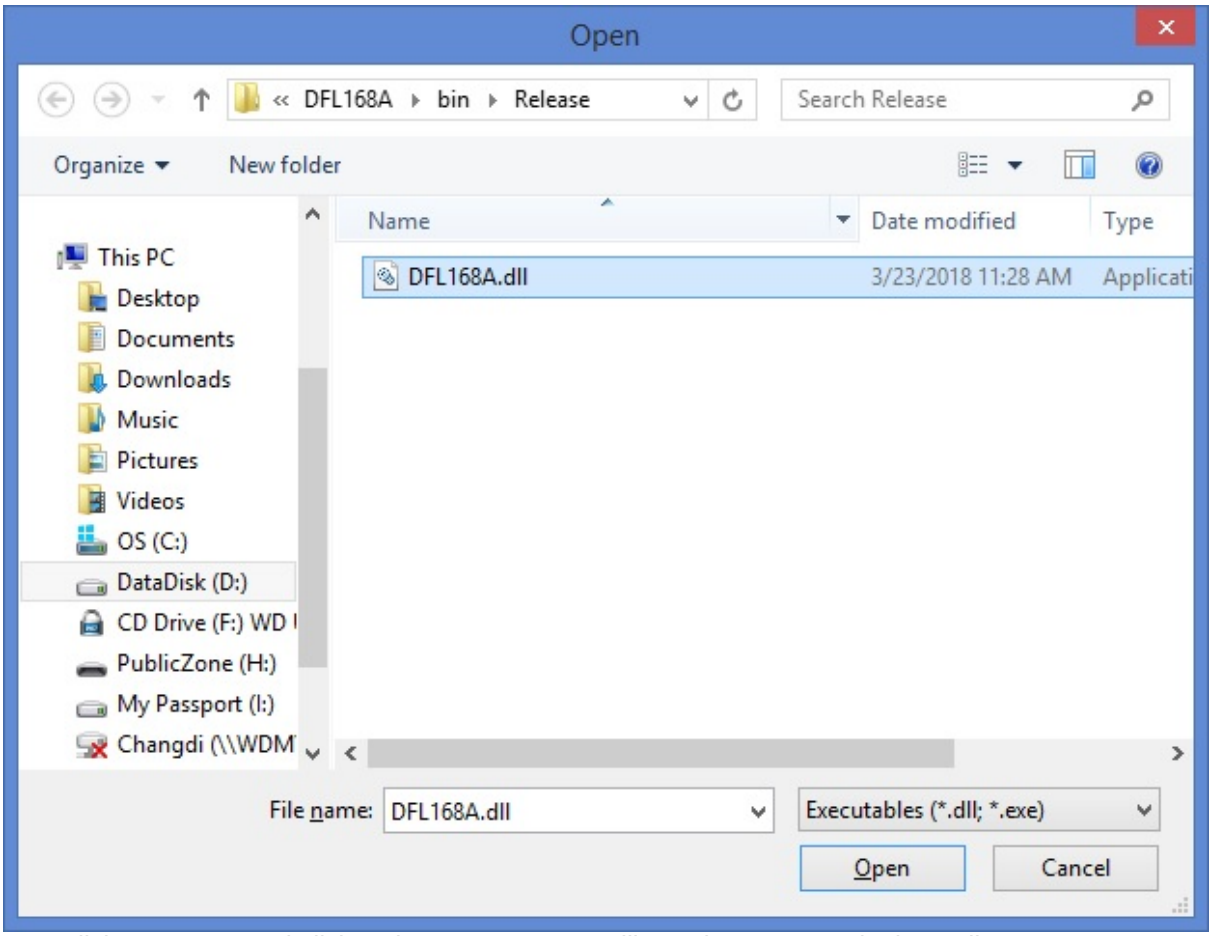

Click on Open, and click on button "OK", You will see the DFL168A in the toolbox:

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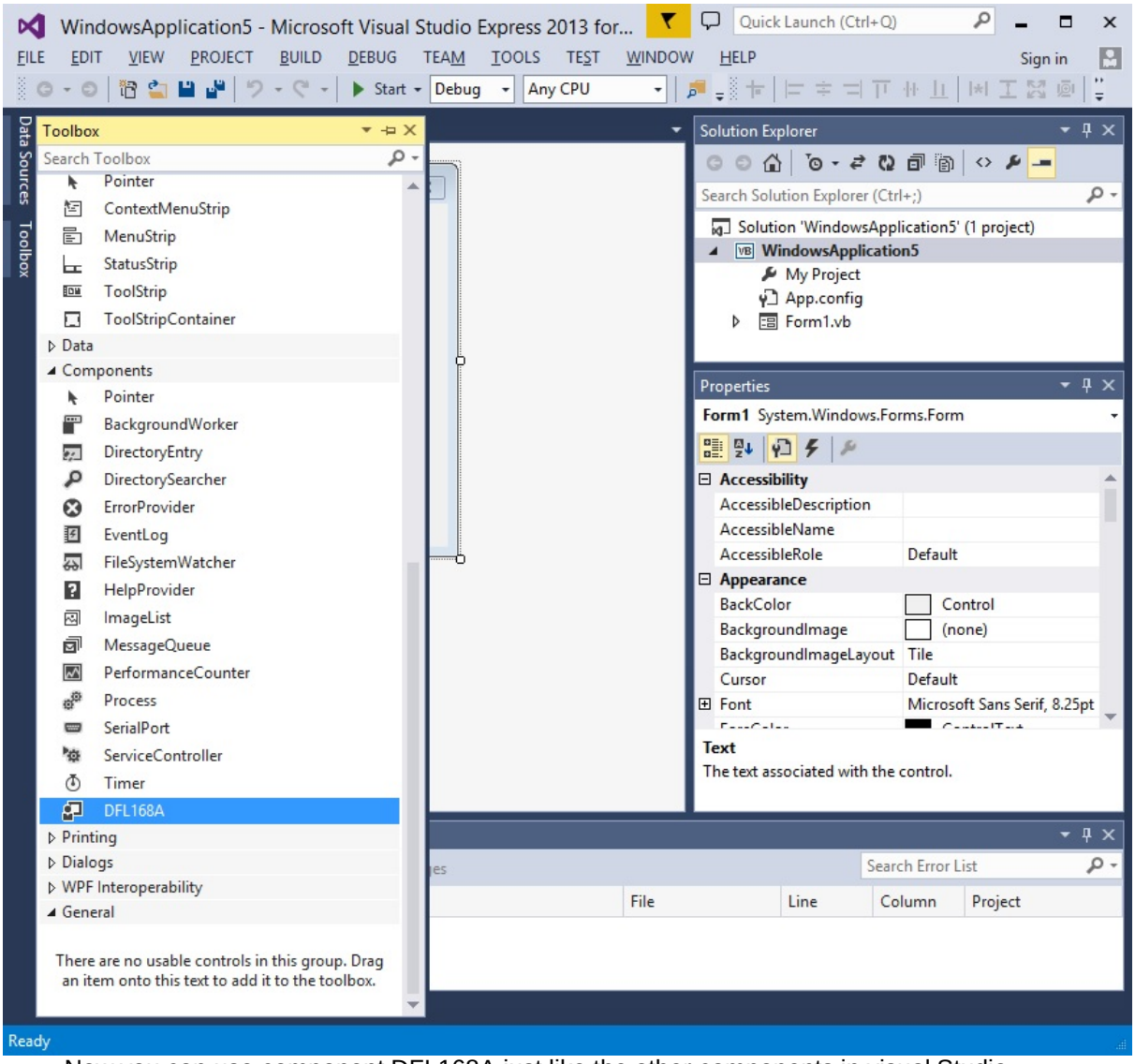

Now you can use component DFL168A just like the other components in visual Studio.

3 How to use the component?

You can simply set some properties in the design time or use the code to change it in the run time.

In general, we must set up the following properties.

- Protocol. It tells IC which protocol will be used for car/truck. It will be one of these values (Enumeration type) :

    1. AUTO_PROTOCOL, ---------- It will automatically choose specific ISO15765 protocol. But it cannot select J1708/J1939 automatically.
    2. ISO15765_11_500_PROTOCOL----------ISO15765 11bit ID and baud rate is 500Kbit/sec
    3. ISO15765_29_500_PROTOCOL----------ISO15765 29bit ID and baud rate is 500Kbit/sec

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4. ISO15765_11_250_PROTOCOL----------ISO15765 11bit ID and baud rate is 250Kbit/sec
5. ISO15765_29_250_PROTOCOL----------ISO15765 29bit ID and baud rate is 250Kbit/sec
6. J1939_PROTOCOL----------J1939 Protocol for Heavy Duty Truck.
7. J1708_PROTOCOL----------J1708/J1587 Protocol for Heavy Duty Truck.

Notes: If you change protocol in the runtime, you must call close() method, and then call open() method.

- PortName. It tells PC which COM port connects DFL168A. It is String type. It is like " COM1" , "COM2",.....
- J1939Baudrate. It will set up baud rate of J1939 protocol. The unit is bit/second. For example, 250Kb/sec, you must input 250000
- OBD_Timeout. It will set up all vehicle protocol's responding time out (including J1939 and J1708 protocol). The unit is ms. For example, PGN65269 broadcast every 1 second, so OBD_Timeout must be set up to 1000 or bigger
- GPS_Baudrate. It will set up GPS's baud rate. The unit is bit/second. For example, 9600b/sec, you must input 9600
- GPS_Timeout. It will set up GPS's responding time out. The unit is ms. For example, One GPS broadcast every 2 second, so GPS_Timeout must be set up to 2000 or bigger

In the run time, we will call DFL168A component's method. All methods will be explained in the next chapter.

Let's make example for using DFL168A component. We use VB.net as language in the examples, of cause, you can use C# easily.

Example 1: ISO15765. In this example, you can get ambient temperature and engine speed by two buttons.

We set up a Form with 2 buttons and one DFL168A component at design time. Please see figure below:

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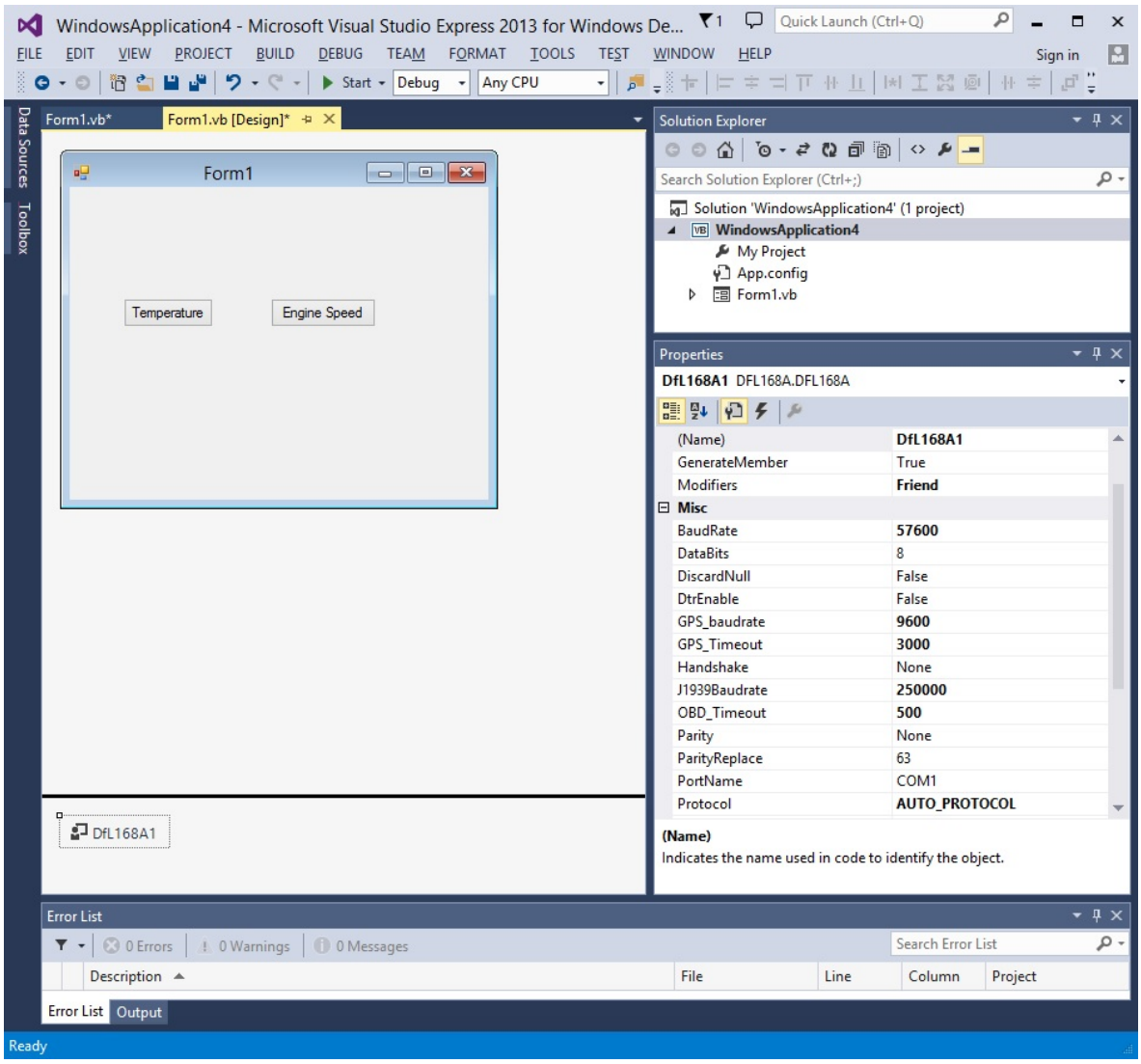

Button1 settings:

Name: btnTemperature

Text: Temperature

Button2 settings:

Name: btnEnginespeed

Text: Engine Speed

DFL168A1 settings:

Name: DFL168A1

Protocol: AUTO_PROTOCOL

OBD_Timeout: 500

PortName: COM1 (Please set to your COM port number)

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EtrEnable: false

DataBits: 8

You must call DFL168A component's open method once. For example, you can have code in Form1's load event

```
Private Sub Form1_Load(sender As Object, e As EventArgs) Handles Me.Load
    DfL168A1.open()
    If DfL168A1.SuccessProtocol = True Then
       btnTemperature.Enabled = True
       btnEnginespeed.Enabled = True
    Else
       btnTemperature.Enabled = false
       btnEnginespeed.Enabled = false
    End If
End Sub
```

It will run for about 5 seconds to make sure whether the protocol you choose in the property is available. You can get read-only property of DfL168A1.SuccessProtocol. If DfL168A1.SuccessProtocol is true, it means that your protocol property match your vehicle. Otherwise, you should call DfL168A1.close(), and set different Protocol value, and call DfL168A1.open() again.

For any method which return Enumeration type: Result, you can use dead-loop to call this method repeatedly until returned result is not WAITING. We double click "Temperature" button to open this button's click event code. Please write code below:

```
Private Sub btnTemperature_Click(sender As Object, e As EventArgs)  _
                                Handles btnTemperature.Click
    Dim Ret As DFL168A.Result
    Dim temp As Single
    Do
       Ret = DfL168A1.ISO15765.getAmbientTemp(temp)
    Loop While Ret = DFL168A.Result.WAITING
    If Ret = DFL168A.Result.SUCCESS Then
       MsgBox("Ambient temperature is " & temp)
    Else
       MsgBox("fail")
    End If
End Sub
```

We double click "Engine Speed" button to open this button's click event code. Please write code below:

```
Private Sub btnEnginespeed_Click(sender As Object, e As EventArgs)  _
                                Handles btnEnginespeed.Click
    Dim Ret As DFL168A.Result
    Dim EngineSpeed As Single
    Do
       Ret = DfL168A1.ISO15765.getEngineSpeed(EngineSpeed)
    Loop While Ret = DFL168A.Result.WAITING
```

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```
      If Ret = DFL168A.Result.SUCCESS Then
         MsgBox("Engine Speed is " & EngineSpeed)
      Else
        MsgBox("fail")
      End If
   End Sub
```

We have done this example. Now you can click "Temperature" button to get ambient temperature, and click "Engine Speed" button to get Engine speed.

We have another way to implement previous function. For any method which return Enumeration type: Result, you can call once, and if returned value is not FAIL, it will generate DataReceived event when success or fail. So you can call this method again in DataReceived event.

In order to identify which button is clicked in the DataReceived event, we have to set up a variable called CMD in the form1 class.

```
            Private CMD As Button
```

We double click "Temperature" button to open this button's click event code. Please write code below:

```
  Private Sub btnTemperature_Click(sender As Object, e As EventArgs)  _
                                  Handles btnTemperature.Click
     Dim temp As Single
     CMD = CType(sender, Button)
     If  DfL168A1.ISO15765.getAmbientTemp(temp)=DFL168A.Result.FAIL Then
         MsgBox("fail")
     End If
  End Sub
```

We double click "Engine Speed" button to open this button's click event code. Please write code below:

```
  Private Sub btnEnginespeed_Click(sender As Object, e As EventArgs)  _
                                  Handles btnEnginespeed.Click
     Dim EngineSpeed As Single
     CMD = CType(sender, Button)
     If  DfL168A1.ISO15765.getEngineSpeed(EngineSpeed)=DFL168A.Result.FAIL  _
     Then  MsgBox("fail")
  End Sub
```

We write the code in the DataReceived event below:

```
  Private Sub DfL168A1_DataReceived(sender As Object,  _
                                  e As IO.Ports.SerialDataReceivedEventArgs)  _
                                    Handles DfL168A1.DataReceived
     Dim temp, EngineSpeed As Single
     If CMD Is btnTemperature Then
         If DfL168A1.ISO15765.getAmbientTemp(temp) =  _
         DFL168A.Result.SUCCESS Then
            MsgBox("Ambient temperature is " & temp)
         Else
            MsgBox("fail")
         End If
     End If
```

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```
    If CMD Is btnEnginespeed Then
        If DfL168A1.ISO15765.getEngineSpeed(EngineSpeed) =  _
        DFL168A.Result.SUCCESS Then
           MsgBox("Engine Speed is " & EngineSpeed)
        Else
           MsgBox("fail")
        End If
    End If
End Sub
```

Now you can click "Temperature" button to get ambient temperature, and click "Engine Speed" button to get Engine speed.

Example 2: J1708/J1587. In this example, you can get ambient temperature and engine speed by two buttons.

All code are almost the same as example1.

Differences from example1:

At design time, DFL168A1"s property: Protocol will be "J1708_PROTOCOL"

At run time, the method name `DfL168A1.ISO15765.getAmbientTemp will be changed to DfL168A1.J1708.getAmbientTemp, and` the method name `DfL168A1.ISO15765.getEngineSpeed will be changed to DfL168A1.J1708.getEngineSpeed.`

Example 3: J1939. In this example, you can get ambient temperature, engine speed, and engine torque by 4 buttons. We know that engine speed and engine torque belong to the same PGN which is PGN61444. So we add "PGN61444 Refresh" button to get the latest data of PGN61444.

We set up a Form with 4 buttons and one DFL168A component at design time. Please see figure below:

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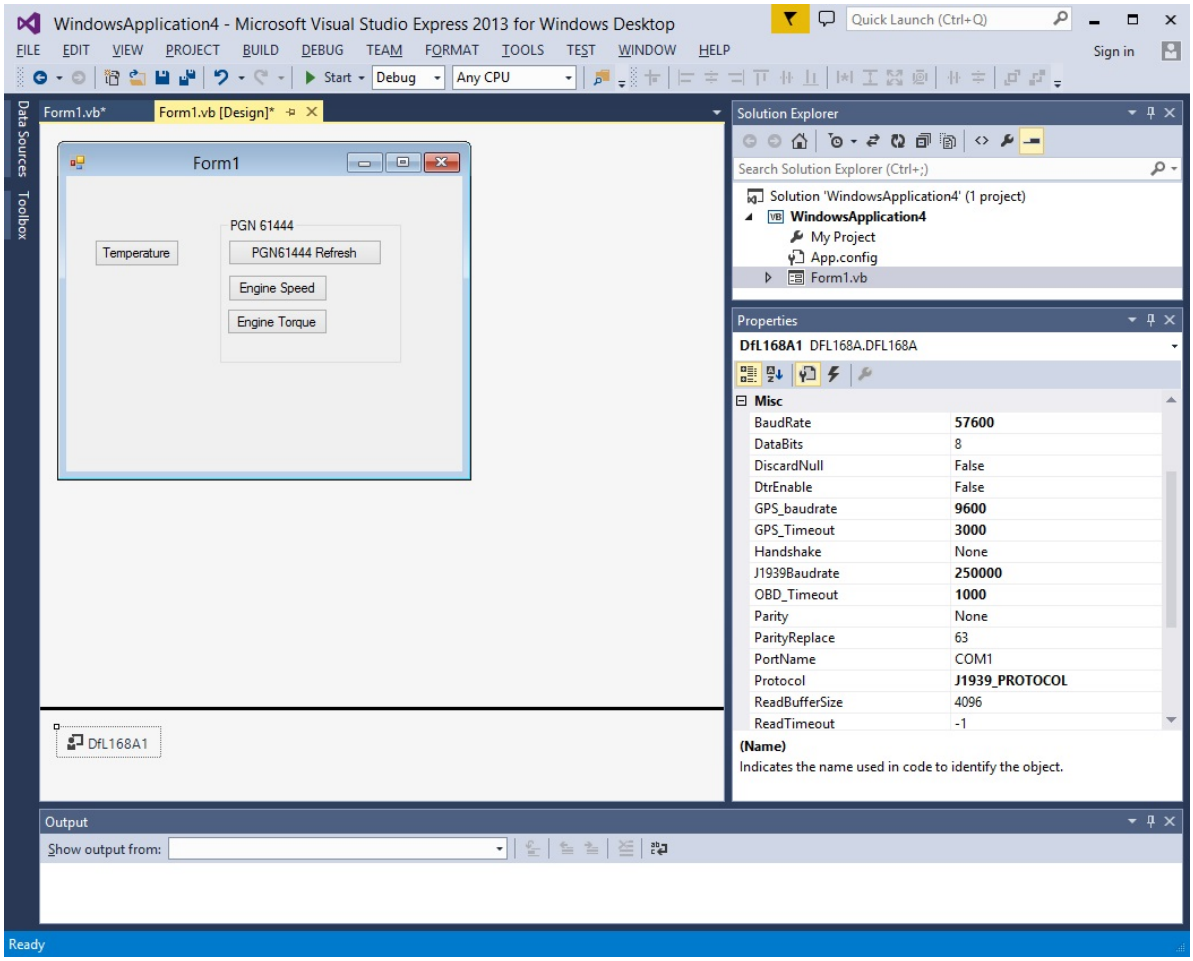

Button1 settings:

Name: btnTemperature

Text: Temperature

Button2 settings:

Name: btnEnginespeed

Text: Engine Speed

Button3 settings:

Name: btnEngineTorque

Text: Engine Torque

Button4 settings:

Name: btnPGN61444_Refresh

Text: PGN61444 Refresh

DFL168A1 settings:

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Name: DFL168A1

Protocol: J1939_PROTOCOL

J1939Baudrate: 250000

OBD_Timeout: 1000

PortName: COM1 (Please set to your COM port number)

EtrEnable: false

DataBits: 8

You must call DFL168A component's open method once. For example, you can have code in Form1's load event

```
Private Sub Form1_Load(sender As Object, e As EventArgs) Handles Me.Load
    DfL168A1.open()
    If DfL168A1.SuccessProtocol = True Then
       btnTemperature.Enabled = True
       btnEnginespeed.Enabled = False
       btnEngineTorque.Enabled = False
       btnPGN61444_Refresh.Enabled = True
    Else
       btnTemperature.Enabled = False
       btnEnginespeed.Enabled = False
       btnEngineTorque.Enabled = False
       btnPGN61444_Refresh.Enabled = False
    End If
End Sub
```

It will run for about 5 seconds to make sure whether the protocol you choose in the property is available. You can get read-only property of DfL168A1.SuccessProtocol. If DfL168A1.SuccessProtocol is true, it means that your protocol property matches your vehicle. Otherwise, you should call DfL168A1.close(), and set different Protocol value, and call DfL168A1.open() again.

For any method which return Enumeration type: Result, you can use dead-loop to call this method repeatedly until returned result is not WAITING. We double click "Temperature" button to open this button's click event code. Please write code below:

```
Private Sub btnTemperature_Click(sender As Object, e As EventArgs)  _
                                Handles btnTemperature.Click
    Dim Ret As DFL168A.Result
    Dim temp As Single
    Do
       Ret = DfL168A1.J1939.PGN65269.refresh()
    Loop While Ret = DFL168A.Result.WAITING
    If Ret = DFL168A.Result.SUCCESS Then
       If DfL168A1.J1939.PGN65269.getAmbientTemp(temp) Then
          MsgBox("Ambient temperature is " & temp)
       Else
         MsgBox("fail to get result")
       End If
    Else
      MsgBox("fail to refresh")
    End If
```

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```
  End Sub
```

We double click "PGN61444 Refresh" button to open this button's click event code. Please write code below:

```
  Private Sub btnPGN61444_Refresh_Click(sender As Object, e As EventArgs)  _
                                        Handles btnPGN61444_Refresh.Click
      Dim Ret As DFL168A.Result
      Do
         Ret = DfL168A1.J1939.PGN61444.refresh()
      Loop While Ret = DFL168A.Result.WAITING
      If Ret = DFL168A.Result.SUCCESS Then
         btnEnginespeed.Enabled = True
         btnEngineTorque.Enabled = True
      Else
         btnEnginespeed.Enabled = False
         btnEngineTorque.Enabled = False
      End If
  End Sub
```

We double click "Engine Speed" button to open this button's click event code. Please write code below:

```
  Private Sub btnEnginespeed_Click(sender As Object, e As EventArgs)  _
                                   Handles btnEnginespeed.Click
      Dim EngineSpeed As Single
      If  DfL168A1.J1939.PGN61444.getEngineSpeed(EngineSpeed) Then
        MsgBox("Engine Speed is " & EngineSpeed)
      Else
        MsgBox("fail to get result")
      End If
  End Sub
```

We double click "Engine Torque" button to open this button's click event code. Please write code below:

```
  Private Sub btnEngineTorque_Click(sender As Object, e As EventArgs)  _
                                    Handles btnEngineTorque.Click
      Dim EngineTorque As Single
      If  DfL168A1.J1939.PGN61444.getActualEngineTorque(EngineTorque) Then
         MsgBox("Engine Torque is " & EngineTorque)
      Else
         MsgBox("fail to get result")
      End If
  End Sub
```

We have done this example. Now you can click "Temperature" button to get ambient temperature, and click "Engine Speed" button to get Engine speed, click "Engine Torque" button to get Engine Torque. Of cause, you must click "PGN61444 Refresh" button in order to get latest "Engine Speed" and "Engine Torque".

We have another way to implement previous function. For any method which return Enumeration type: Result, you can call once, and if returned value is not FAIL, it will generate DataReceived event when success or fail. So you can call this method again in DataReceived event.

In order to identify which button is clicked in the DataReceived event, we have to set up a variable called CMD in the form1 class.

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```
            Private CMD As Button
```

We double click "Temperature" button to open this button's click event code. Please write code below:

```
Private Sub btnTemperature_Click(sender As Object, e As EventArgs)  _
                                Handles btnTemperature.Click
    Dim temp As Single
    CMD = CType(sender, Button)
    If DfL168A1.J1939.PGN65269.refresh()=DFL168A.Result.FAIL Then MsgBox("fail")

End Sub
```

We double click "PGN61444 Refresh" button to open this button's click event code. Please write code below:

```
Private Sub btnPGN61444_Refresh_Click(sender As Object, e As EventArgs)  _
                                    Handles btnPGN61444_Refresh.Click
    Dim temp As Single
    CMD = CType(sender, Button)
    If DfL168A1.J1939.PGN61444.refresh()=DFL168A.Result.FAIL Then
       MsgBox("fail")
       btnEnginespeed.Enabled = False
       btnEngineTorque.Enabled = False
    End If
End Sub
```

We write the code in the DataReceived event below:

```
Private Sub DfL168A1_DataReceived(sender As Object, e  _
As IO.Ports.SerialDataReceivedEventArgs) Handles DfL168A1.DataReceived
    Dim temp, EngineSpeed As Single
    If CMD Is btnTemperature Then
       If DfL168A1.J1939.PGN65269.refresh()=DFL168A.Result.SUCCESS Then
          If  DfL168A1.J1939.PGN61444.getEngineSpeed(EngineSpeed) Then
             MsgBox("Ambient temperature is " & temp)
          Else
            MsgBox("fail")
          End If
       Else
          MsgBox("fail to refresh")
       End If
    End If
    If CMD Is btnPGN61444_Refresh Then
       If DfL168A1.J1939.PGN61444.refresh() = DFL168A.Result.SUCCESS Then
          btnEnginespeed.Enabled = True
          btnEngineTorque.Enabled = True
       Else
          btnEnginespeed.Enabled = False
          btnEngineTorque.Enabled = False
       End If
    End If
End Sub
```

"Engine Speed" and "Engine Torque" buttons click event code are the same as before.

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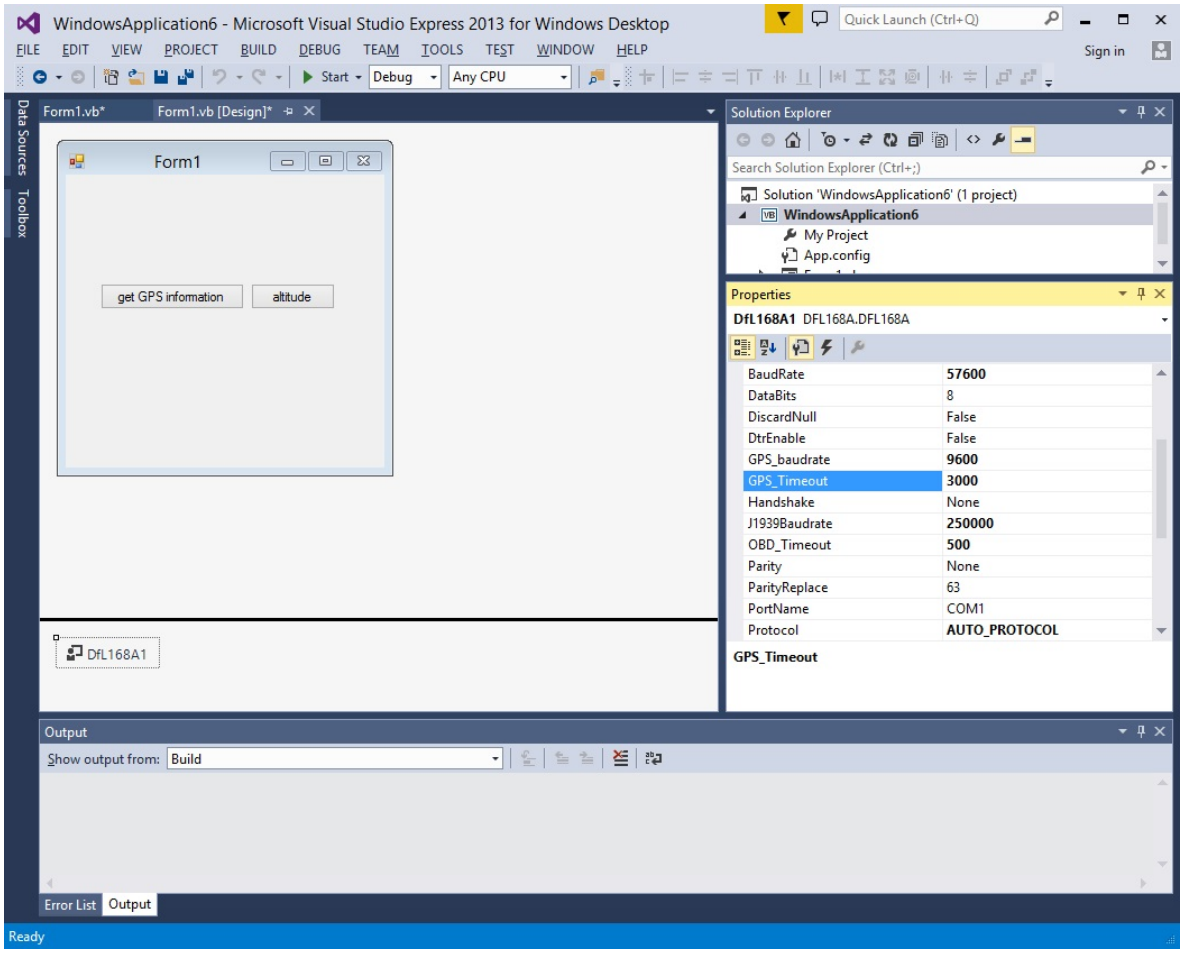
Now you can click "Temperature" button to get ambient temperature, and click "Engine Speed" button to get Engine speed, click "Engine Torque" button to get Engine Torque. Of cause, you must click "PGN61444 Refresh" button in order to get latest "Engine Speed" and "Engine Torque".

Example 4: GPS. In this example, you can get GPS information by two buttons

We set up a Form with 2 buttons and one DFL168A component at design time. Please see figure below:



Button1 settings:

Name: btnGPSinfo

Text: get GPS information

Button2 settings:

Name: btnAltitude

Text: altitude

DFL168A1 settings:

Name: DFL168A1

GPS_baudrate: 9600 (Please set to your GPS Baud rate)

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GPS_Timeout: 3000

PortName: COM1 (Please set to your COM port number)

EtrEnable: false

DataBits: 8

You must call DFL168A component's open method once. For example, you can have code in Form1's load event

```
Private Sub Form1_Load(sender As Object, e As EventArgs) Handles Me.Load
   DfL168A1.open()
End Sub
```

For any method which return Enumeration type: Result, you can use dead-loop to call this method repeatedly until returned result is not WAITING. We double click "get GPS information" button to open this button's click event code. Please write code below:

```
Private Sub btnGPSinfo_Click(sender As Object, e As EventArgs)  _
                            Handles btnGPSinfo.Click
   Dim Ret As DFL168A.Result
   Dim lat, longitu, speed As Single
   Dim TimeFrmGPS, DateFrmGPS As String
   TimeFrmGPS = ""
   DateFrmGPS = ""
   Do
      Ret = DfL168A1.GPS.getGPSinfo(lat, longitu, speed,  _
                                    TimeFrmGPS, DateFrmGPS)
   Loop While Ret = DFL168A.Result.WAITING
   If Ret = DFL168A.Result.SUCCESS Then
      MsgBox("Latitude is " & lat)
      MsgBox("Longitude is " & longitu)
      MsgBox("speed is " & speed)
      MsgBox("Time is " & TimeFrmGPS)
      MsgBox("Date is " & DateFrmGPS)
   Else
      MsgBox("fail")
   End If
End Sub
```

We double click "altitude" button to open this button's click event code. Please write code below:

```
Private Sub btnAltitude_Click(sender As Object, e As EventArgs)  _
                             Handles btnAltitude.Click
   Dim Ret As DFL168A.Result
   Dim Alti As Single
   Do
       Ret = DfL168A1.GPS.getAltitude(Alti)
   Loop While Ret = DFL168A.Result.WAITING
   If Ret = DFL168A.Result.SUCCESS Then
      MsgBox("Altitude is " & Alti)
   Else
```

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```
        MsgBox("fail")
    End If
End Sub
```

We have done this example. Now you can click "get GPS information" button to get longitude/latitude/speed/time/date, and click "altitude" button to get altitude.

We have another way to implement previous function. For any method which return Enumeration type: Result, you can call once, and if returned value is not FAIL, it will generate DataReceived event when success or fail. So you can call this method again in DataReceived event.
In order to identify which button is clicked in the DataReceived event, we have to set up a variable called CMD in the form1 class.

```
Private CMD As Button
```

We double click "get GPS information" button to open this button's click event code. Please write code below:

```
Private Sub btnGPSinfo_Click(sender As Object, e As EventArgs)  _
                            Handles btnGPSinfo.Click
    Dim lat, longitu, speed As Single
    Dim TimeFrmGPS, DateFrmGPS As String
    TimeFrmGPS = ""
    DateFrmGPS = ""
    CMD = CType(sender, Button)
    If DfL168A1.GPS.getGPSinfo(lat, longitu, speed, TimeFrmGPS, DateFrmGPS)  _
    = DFL168A.Result.FAIL Then MsgBox("fail")
End Sub
```

We double click "altitude" button to open this button's click event code. Please write code below:

```
Private Sub btnAltitude_Click(sender As Object, e As EventArgs)  _
                             Handles btnAltitude.Click
    Dim Alti As Single
    CMD = CType(sender, Button)
    If DfL168A1.GPS.getAltitude(Alti) = DFL168A.Result.FAIL Then MsgBox("fail")
End Sub
```

We write the code in the DataReceived event below:

```
Private Sub DfL168A1_DataReceived(sender As Object, e As  _
    IO.Ports.SerialDataReceivedEventArgs) Handles DfL168A1.DataReceived
    Dim lat, longitu, speed As Single
    Dim Alti As Single
    Dim TimeFrmGPS, DateFrmGPS As String
    TimeFrmGPS = ""
    DateFrmGPS = ""
    If CMD Is btnGPSinfo Then
        If DfL168A1.GPS.getGPSinfo(lat, longitu, speed, TimeFrmGPS, DateFrmGPS)
_
        = DFL168A.Result.SUCCESS Then
            MsgBox("Latitude is " & lat)
            MsgBox("Longitude is " & longitu)
            MsgBox("speed is " & speed)
            MsgBox("Time is " & TimeFrmGPS)
            MsgBox("Date is " & DateFrmGPS)
```

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```
            Else
               MsgBox("fail")
            End If
         End If
         If CMD Is btnAltitude Then
            If DfL168A1.GPS.getAltitude(Alti) = DFL168A.Result.SUCCESS Then
               MsgBox("Altitude is " & Alti)
            Else
               MsgBox("fail")
            End If
         End If
   End Sub
```

```
Now you can click "get GPS information" button to get
longitude/latitude/speed/time/date, and click "altitude" button to get altitude.
```

4 Enumeration

We have 2 enumerations.

One is Result which has 3 values: WAITING, SUCCESS and FAIL.

The other is Protocol which has 7 values: AUTO_PROTOCOL, ISO15765_11_500_PROTOCOL, ISO15765_29_500_PROTOCOL, ISO15765_11_250_PROTOCOL, ISO15765_29_250_PROTOCOL, J1939_PROTOCOL and J1708_PROTOCOL

From these symbol name, you can know the meaning easily.

5 DFL168A Class

Most of methods are non-blocked. It will return immediately, not waiting for the finish of DFL168A command.

5.1 Properties

Common Properties:

- Protocol---------- It is vehicle protocol, it is enumeration Protocol value
- OBD_Timeout----------It is vehicle command time out value in milliseconds.
- J1939Baudrate----------It is baud rate for J1939 protocol in bit/second
- GPS_baudrate----------It is baud rate for GPS Device in bit/second
- GPS_Timeout----------It is GPS command time out value in milliseconds. It depends on how often NMEA0183 information send out by GPS Device
- TransparantSerialAvailable--------Read-only. True or false, It tells us whether PC com port directly connect to DEV1 serial port of DFL168A virtually. You can call beginTransparentSerial() method to set up a virtual link between PC COM and DEV1 serial port.
- SuccessProtocol----------Read-only. True or false. It tell us whether vehicle protocol you

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set is correct after you call open method.

- PortName----------PC Com name which connects Serial port of DFL68A. It is string as "COM1, COM2,..."

5.2 Members

Class DFL168A has the following members:

J1939

J1708

ISO15765

GPS

Above members are actually object. We will explain these inner object later.

5.3 Event

We have a special event: DataReceived.
After you call non-block method, it will send DataReceived event if this method get SUCCESS/FAIL result. And then you can call this method again to get parameters value you want in this event.

5.4 Methods

```
Sub open(Optional ByVal intrude As Boolean = True,  _
        Optional ByVal Fast As Boolean = False)
Sub close()
Function setSleepDelay(ByVal SleepDelayms As UShort) As Boolean
Function getOnewireID(ByRef ID() As Short) As Boolean
Function getDIN(ByVal PortNum As Int16) As Boolean
Sub setDOUT(ByVal PortNum As Int16, ByVal value As Boolean)
Function getAnalog() As Single  '0.0 to 999.00
Sub beginTransparentSerial()
Sub endTransparentSerial()
Function setExitTransparentKey(ByVal EndTransparentChar As Byte) As Boolean
```

5.4.1 open Method

```
Sub open(Optional ByVal intrude As Boolean = True,   _
        Optional ByVal Fast As Boolean = False)
```

Description

open method will open PC COM Port and config DFL168A IC and check whether protocol is OK. If config and protocol succeed, it will set SuccessProtocol property to true, otherwise set to false. This method will run as long as 5 seconds for checking vehicle protocol.

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Parameters

intrude: the first parameter, boolean type, this is input parameter. It denotes DFL168A will send request to vehicle when its value is true. And DFL168A won't send request to vehicle for J1708/J1939 protocol when its value is false, so DFL168A only uses broadcast of vehicle data.

Fast: the second parameter, boolean type,this is input parameter. It won't send any config data to DFL168A if its value is true. So in this situation, you should setup DFL168A by yourself via hyper-terminal. Open method will send all config data to DFL168A if its value is false. You don't need take care of anything. Open method takes care of everything for you. We suggest you set Fast to false.

5.4.2 close Method

```
Sub close()
```

Description

DFL168A.close() will release PC serial port which is used by DFL168A, and You can use open method again only after you run this method.

Parameters

Nothing

Returns

Nothing

5.4.3 setSleepDelay

```
Function setSleepDelay(ByVal SleepDelayms As UShort) As Boolean
```

Description

setSleepDelay is delay time to enter sleep in seconds when DFL168A find no data activity in the vehicle Data bus for specified protocol. Maximum value is 65535 sec, that is around 18.2 hours. So you can disable sleep function if you call this method to delay sleep 18.2 hours once every 18 hours. It will return true if ID succeed to get, otherwise return false.

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Parameters

SleepDelayms: the first parameter, UShort type, this is input parameter. DFL168A will delay "SleepDelayms" seconds to .enter sleep state if DFL168A find no data activity in the vehicle Data bus for specified protocol

Returns

Boolean

5.4.4 getOnewireID Method

```
Function getOnewireID(ByRef ID() As Short) As Boolean
```

Description

getOnewireID will get ID from One wire bus device (iButton). It will return true if ID succeed to get, otherwise return false.

Parameters

ID: the first parameter, 7 short array type, this is output parameter. The 7 bytes' ID will be put into this parameter.

Returns

Boolean

5.4.5 getDIN Method

```
Function getDIN(ByVal PortNum As Int16) As Boolean
```

Description

getDIN will return Digital input of DFL168A. True means Logic High, false means Logic Low.

Parameters

portNo: the first parameter, int16 type, this is input parameter. It is DFL168A's Digital input number.

Returns

Boolean

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5.4.6 setDOUT Method

```
Sub setDOUT(ByVal PortNum As Int16, ByVal value As Boolean)
```

Description

setDOUT will set Digital output of DFL168A.

Parameters

portNo: the first parameter, int16 type, this is input parameter. It is DFL168A's Digital output number.

Value: the second parameter, Boolean type, this is input parameter,true means Logic High, false means Logic Low.

5.4.7 getAnalog Method

```
Function getAnalog() As Single
```

Description

getAnalog will read analog input of DFL168A. value range: 0.0 to 999.00

Parameters

Nothing

Returns

Single

5.4.8 beginTransparentSerial Method

```
Sub beginTransparentSerial()
```

Description

beginTransparentSerial will use PC COM port to access DEV1 (Another serial port) of DFL168A directly. This PC COM port was used for DFL168A Command in the past, now it is changed. You will use PC COM port to send/receive data to/from DEV1 of DFL168A directly. In general, DEV1 connects GPS module.

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Parameters

Nothing

5.4.9 endTransparentSerial Method

```
Sub endTransparentSerial()
```

Description

endTransparentSerial will resume PC COM Port to access DFL168A Command. For DEV1, now you cannot directly control it by PC's COM port.

Parameters

Nothing

5.4.10 setExitTransparentKey Method

```
Function setExitTransparentKey(ByVal EndTransparentChar As Byte) As Boolean
```

Description

setExitTransparentKey() will set up character for exiting Transparent Serial mode. When hardware Serial of DFL168A, which was used by DFL168A interface command, received this ASCII code from PC COM port, DFL168A will resume the hardware Serial to use for DFL168A interface Command. This method return true when setting succeed.

Parameters

EndTransparentChar: the first parameter, Byte type, this is input parameter. It is ASCII code of exiting Transparent Serial.

Returns

Boolean

5.5 Inner Class J1939

5.5.1 Members

Class J1939 has the following members:

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PGN65267;

PGN65262;

PGN65256;

PGN65269;

PGN65257;

PGN61444;

PGN61443;

PGN65270;

PGN65271;

PGN65272;

PGN65266;

PGN65263;

PGN65253;

PGN65214;

PGN65248;

PGN65276;

PGN65265;

PGN57344;

Above members are actually object. We will explain these inner object later. They are almost the same as counter parts of synchronous version

5.5.2 Methods

```
Public Function getVIN(ByRef VIN As String) As Result
Public Function getDTC(ByRef DTC_Num As Short, ByRef SPN() As Integer,  _
                       ByRef FMI() As Short, ByRef CM() As Short,  _
                       ByRef OC() As Short,  _
                       Optional ByVal DTCFormat As Short = 1) As Result
Public Function clearDTC() As Result
```

5.5.2.1 getVIN Method

```
Public Function getVIN(ByRef VIN As String) As Result
```

Description

J1939.getVIN will get 19 characters' VIN number from vehicle. It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL

Parameters

VIN: the first parameter, String type, this is output parameter, It is VIN string of vehicle.

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Returns

Result

5.5.2.2 getDTC Method

```
Public Function getDTC(ByRef DTC_Num As Short, ByRef SPN() As Integer,  _
                       ByRef FMI() As Short, ByRef CM() As Short,  _
                       ByRef OC() As Short, Optional ByVal DTCFormat  _
                       As Short = 1) As Result
```

Description

This method will get DTC information of vehicle. It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL. Note: It only can get maximum of 5 DTC because of hardware serial buffer limit

Parameters

DTC_Num: the first parameter, Short type, this is output parameter, It is quantity of vehicle DTC.

SPN: the second parameter, 5 elements' Integer array type, this is output parameter, It is SPN number of vehicle.

FMI: the third parameter, 5 elements' Short array type,this is output parameter,It is FMI of vehicle.

CM(): the 4th parameter, 5 elements' Short array type,this is output parameter, It is CM of vehicle.

OC(): the 5th parameter, 5 elements' Short array type,this is output parameter, It is OC of vehicle.

DTCFormat: the 6th parameter, Short type, this is input parameter,It is DTC Format Version of vehicle. It can be 1, 2, 3, and 4

Returns

Result

5.5.2.3 clearDTC Method

```
Public Function clearDTC() As Result
```

Description

J1939.clearDTC will clear DTC of vehicle. It will return SUCCESS if succeed to get, otherwise return

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FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

Parameters

Nothing

Returns

```
Result
```

5.5.3 Inner Class PGN65267

5.5.3.1 Methods

```
Function refresh() As Result
Function getLatitude(ByRef Latitude As Single) As Boolean
Function getLongitude(ByRef Longitude As Single) As Boolean
```

5.5.3.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65267.refresh will refresh PGN65267 data from vehicle. It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

Nothing

Returns

```
Result
```

5.5.3.1.2 getLatitude Method

```
Function getLatitude(ByRef Latitude As Single) As Boolean
```

Description

PGN65267.getLatitude will get Latitude from vehicle. It will return true if success, otherwise return false.

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Parameters

Latitude: the first parameter, `Single` type, this is output parameter, It is latitude of vehicle location.

Returns
`Boolean`

5.5.3.1.3 getLongitude Method

```
Function getLongitude(ByRef Longitude As Single) As Boolean
```

Description

PGN65267.getLongitude will get Longitude from vehicle. It will return true if success, otherwise return false.

Parameters

Longitude: the first parameter, `Single` type, this is output parameter, It is Longitude of vehicle location.

Returns
`Boolean`

5.5.4 Inner Class PGN65262

5.5.4.1 Methods

```
Function refresh() As Result
Function getCoolantTemperature(ByRef temp As Single) As Boolean
Function getFuelTemp(ByRef temp As Single) As Boolean
Function getOilTemp(ByRef temp As Single) As Boolean
```

5.5.4.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65262.refresh will refresh PGN65262 data from vehicle. It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

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Nothing

Returns
Result

5.5.4.1.2 getCoolantTemperature Method

```
Function getCoolantTemperature(ByRef temp As Single) As Boolean
```

Description

PGN65262.getCoolantTemperature will get engine coolant temperature in Celsius degree. It will return true if success, otherwise return false.

Parameters

temp: the first parameter, Single type, this is output parameter, It is engine coolant temperature in Celsius degree.

Returns
Boolean

5.5.4.1.3 getFuelTemp Method

```
Function getFuelTemp(ByRef temp As Single) As Boolean
```

Description

PGN65262.getFuelTemp will get fuel temperature in Celsius degree. It will return true if success, otherwise return false.

Parameters

temp: the first parameter, Single type, this is output parameter, It is fuel temperature in Celsius degree.

Returns
Boolean

5.5.4.1.4 getOilTemp Method

```
Function getOilTemp(ByRef temp As Single) As Boolean
```

Description

PGN65262.getOilTemp will get engine oil temperature in Celsius degree. It will return true if success, otherwise return false.

Parameters

temp: the first parameter, Single type, this is output parameter, It is engine oil temperature in Celsius degree.

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Returns
Boolean

5.5.5 Inner Class PGN65256

5.5.5.1 Methods

```
Function refresh() As Result
Function getAltitude(ByRef Altitude As Single) As Boolean
Function getNavBasedSpeed(ByRef speed As Single) As Boolean
```

5.5.5.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65256.refresh will refresh PGN65256 data from vehicle. It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

Nothing

Returns
Result

5.5.5.1.2 getAltitude Method

```
Function getAltitude(ByRef Altitude As Single) As Boolean
```

Description

PGN65256.getAltitude will get Altitude from vehicle. It will return true if success, otherwise return false.

Parameters

Altitude: the first parameter, Single type, this is output parameter, It is Altitude of vehicle location.

Returns
Boolean

5.5.5.1.3 getNavBasedSpeed Method

```
Function getNavBasedSpeed(ByRef speed As Single) As Boolean
```

Description

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PGN65256.getNavBasedSpeed will get vehicle speed based on navigation in Km/h. It will return true if success, otherwise return false.

Parameters

Speed: the first parameter, `Single` type, this is output parameter, It is vehicle speed based on navigation in Km/h

Returns
`Boolean`

5.5.6 Inner Class PGN65269

5.5.6.1 Methods

```
Function refresh() As Result
Function getBarometricPressure(ByRef BaroPressure As Single) As Boolean
Function getAmbientTemp(ByRef AmbientTemp As Single) As Boolean
Function getInletTemp(ByRef InletTemp As Single) As Boolean
Function getRoadTemp(ByRef RoadTemp As Single) As Boolean
Function getCabInteriorTemp(ByRef CabInteriorTemp As Single) As Boolean
```

5.5.6.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65269.refresh() will refresh PGN65269 data from vehicle. It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

Nothing

Returns
`Result`

5.5.6.1.2 getBarometricPressure Method

```
Function getBarometricPressure(ByRef BaroPressure As Single) As Boolean
```

Description

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PGN65269.getBarometricPressure will get Barometric Pressure in KPa. It will return true if success, otherwise return false.

Parameters

BaroPressure: the first parameter, `Single` type, this is output parameter, It is Barometric Pressure in kPa

Returns
`Boolean`

5.5.6.1.3 getAmbientTemp Method

```
Function getAmbientTemp(ByRef AmbientTemp As Single) As Boolean
```

Description

PGN65269.getAmbientTemp will get Ambient Air Temperature in Celsius degree. It will return true if success, otherwise return false.

Parameters

AmbientTemp: the first parameter, `Single` type, this is output parameter, It is Ambient Air Temperature in Celsius degree.

Returns
`Boolean`

5.5.6.1.4 getInletTemp Method

```
Function getInletTemp(ByRef InletTemp As Single) As Boolean
```

Description

PGN65269.getInletTemp will get Engine Air Inlet Temperature in Celsius degree. It will return true if success, otherwise return false.

Parameters

InletTemp: the first parameter, `Single` type, this is output parameter, It is Air Inlet Temperature in Celsius degree.

Returns
`Boolean`

5.5.6.1.5 getRoadTemp Method

```
Function getRoadTemp(ByRef RoadTemp As Single) As Boolean
```

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Description

PGN65269.getRoadTemp will get road Temperature in Celsius degree. It will return true if success, otherwise return false.

Parameters

RoadTemp: the first parameter, `Single` type, this is output parameter, It is road Temperature in Celsius degree.

Returns

`Boolean`

5.5.6.1.6 getCabInteriorTemp Method

```
Function getCabInteriorTemp(ByRef CabInteriorTemp As Single) As Boolean
```

Description

PGN65269.getCabInteriorTemp will get Cab Interior Temperature in Celsius degree. It will return true if success, otherwise return false.

Parameters

CabInteriorTemp: the first parameter, `Single` type, this is output parameter, It is Cab Interior Temperature in Celsius degree.

Returns

`Boolean`

5.5.7 Inner Class PGN65257

5.5.7.1 Methods

```
Function refresh() As Result
Function getEngineTripFuel(ByRef EngineTripFuel As Single) As Boolean
Function getEngineTotalFuelUsed(ByRef EngineTotalFuelUsed As Single) As Boolean
```

5.5.7.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65257.refresh() will refresh PGN65257 data from vehicle.It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you

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will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

Nothing

Returns

`Result`

5.5.7.1.2 getEngineTripFuel Method

```
Function getEngineTripFuel(ByRef EngineTripFuel As Single) As Boolean
```

Description

PGN65257.getEngineTripFuel will get Engine Trip Fuel in L. It will return true if success, otherwise return false.

Parameters

EngineTripFuel: the first parameter, `Single` type, this is output parameter, It is Engine Trip Fuel in L.

Returns

`Boolean`

5.5.7.1.3 getEngineTotalFuelUsed Method

```
Function getEngineTotalFuelUsed(ByRef EngineTotalFuelUsed As Single) As Boolean
```

Description

PGN65257.getEngineTotalFuelUsed will get Engine Total Fuel Used in L. It will return true if success, otherwise return false.

Parameters

EngineTotalFuelUsed: the first parameter, `Single` type, this is output parameter, It is Engine Total Fuel Used in L.

Returns

`Boolean`

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5.5.8 Inner Class PGN61444

5.5.8.1 Methods

```
Function refresh() As Result
Function getActualEngineTorque(ByRef ActualEngineTorque As Single) As Boolean
Function getEngineSpeed(ByRef EngineSpeed As Single) As Boolean
```

5.5.8.1.1 refresh Method

byte refresh();

Description

PGN61444.refresh() will refresh PGN61444 data from vehicle.It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Syntax

DFL168A.J1939.PGN61444.refresh();

Parameters

Nothing

Returns

byte

5.5.8.1.2 getActualEngineTorque Method

```
Function getActualEngineTorque(ByRef ActualEngineTorque As Single) As Boolean
```

Description

PGN61444.getActualEngineTorque will get Actual Engine - Percent Torque. It will return true if success, otherwise return false.

Parameters

ActualEngineTorque: the first parameter, `Single` type, this is output parameter, It is Actual Engine - Percent Torque.

Returns

`Boolean`

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5.5.8.1.3 getEngineSpeed Method

```
Function getEngineSpeed(ByRef EngineSpeed As Single) As Boolean
```

Description

PGN61444.getEngineSpeed will get engine speed in rpm. It will return true if success, otherwise return false.

Parameters

EngineSpeed: the first parameter, `Single` type, this is output parameter, It is engine speed in rpm.

Returns

`Boolean`

5.5.9 Inner Class PGN61443

5.5.9.1 Methods

```
Function refresh() As Result
Function getAccelPedalPosi1(ByRef AccelPedalPosi1 As Single) As Boolean
Function getAccelPedalPosi2(ByRef AccelPedalPosi2 As Single) As Boolean
Function getEnginePerLoadAtCurrSpeed(ByRef EnginePerLoadAtCurrSpeed As Single)  _
                                    As Boolean
```

5.5.9.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN61443.refresh() will refresh PGN61443 data from vehicle. It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

Nothing

Returns

`Result`

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5.5.9.1.2 getAccelPedalPosi1 Method

```
Function getAccelPedalPosi1(ByRef AccelPedalPosi1 As Single) As Boolean
```

Description

PGN61443.getAccelPedalPosi1 will get Accelerator Pedal Position 1 in percentage. It will return true if success, otherwise return false.

Parameters

AccelPedalPosi1: the first parameter, `Single` type, this is output parameter, It is Accelerator Pedal Position 1 in percentage.

Returns

`Boolean`

5.5.9.1.3 getAccelPedalPosi2 Method

```
Function getAccelPedalPosi2(ByRef AccelPedalPosi2 As Single) As Boolean
```

Description

PGN61443.getAccelPedalPosi2 will get Accelerator Pedal Position 2 in percentage. It will return true if success, otherwise return false.

Parameters

AccelPedalPosi2: the first parameter, `Single` type, this is output parameter, It is Accelerator Pedal Position 2 in percentage.

Returns

`Boolean`

5.5.9.1.4 getEnginePerLoadAtCurrSpeed Method

```
Function getEnginePerLoadAtCurrSpeed(ByRef EnginePerLoadAtCurrSpeed As Single) _
                                     As Boolean
```

Description

PGN61443.getEnginePerLoadAtCurrSpeed will get Engine Percent Load At Current Speed. It will return true if success, otherwise return false.

Parameters

EnginePerLoadAtCurrSpeed: the first parameter, `Single` type, this is output parameter, It is Engine

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Percent Load At Current Speed.

Returns
Boolean

5.5.10 Inner Class PGN65270

5.5.10.1 Methods

```
Function refresh() As Result
Function getIntakeManifoldPressure(ByRef IntakeManifoldPressure As Single)  _
                                   As Boolean
Function getIntakeManifoldTemp(ByRef IntakeManifoldTemp As Single) As Boolean
Function getEngineAirInletPressure(ByRef EngineAirInletPressure As Single)  _
                                   As Boolean
Function getEngineExhaustGasTemp(ByRef EngineExhaustGasTemp As Single) As Boolean
Function getEngineAirFilterDiffPressure(ByRef EngineAirFilterDiffPressure  _
                                        As Single) As Boolean
```

5.5.10.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65270.refresh() will refresh PGN65270 data from vehicle.It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

Nothing

Returns
Result

5.5.10.1.2 getIntakeManifoldPressure Method

```
Function getIntakeManifoldPressure(ByRef IntakeManifoldPressure As Single)  _
                                   As Boolean
```

Description

PGN65270.getIntakeManifoldPressure will get Engine Intake Manifold #1 Pressure in kPa. It will return true if success, otherwise return false.

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Parameters

IntakeManifoldPressure: the first parameter, `Single` type, this is output parameter, It is Engine Intake Manifold #1 Pressure in kPa.

Returns

`Boolean`

5.5.10.1.3 getIntakeManifoldTemp Method

```
Function getIntakeManifoldTemp(ByRef IntakeManifoldTemp As Single) As Boolean
```

Description

PGN65270.getIntakeManifoldTemp will get Engine Intake Manifold 1 Temperature in Celsius degree. It will return true if success, otherwise return false.

Parameters

IntakeManifoldTemp: the first parameter, `Single` type, this is output parameter, It is Engine Intake Manifold 1 Temperature in Celsius degree.

Returns

`Boolean`

5.5.10.1.4 getEngineAirInletPressure Method

```
Function getEngineAirInletPressure(ByRef EngineAirInletPressure As Single)  _
                                   As Boolean
```

Description

PGN65270.getEngineAirInletPressure will get Engine Air Inlet Pressure in kPa. It will return true if success, otherwise return false.

Parameters

EngineAirInletPressure: the first parameter, `Single` type, this is output parameter, It is Engine Air Inlet Pressure in kPa.

Returns

`Boolean`

5.5.10.1.5 getEngineExhaustGasTemp Method

```
Function getEngineExhaustGasTemp(ByRef EngineExhaustGasTemp As Single) As Boolean
```

Description

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PGN65270.getEngineExhaustGasTemp will get Engine Exhaust Gas Temperature in Celsius degree. It will return true if success, otherwise return false.

Parameters

EngineExhaustGasTemp: the first parameter, `Single` type, this is output parameter, It is Engine Exhaust Gas Temperature in Celsius degree.

Returns

`Boolean`

5.5.10.1.6 getEngineAirFilterDiffPressure Method

```
Function getEngineAirFilterDiffPressure(ByRef EngineAirFilterDiffPressure As
Single)  _
                                        As Boolean
```

Description

PGN65270.getEngineAirFilterDiffPressure will get Engine Air Filter 1 Differential Pressure in kPa. It will return true if success, otherwise return false.

Parameters

EngineAirFilterDiffPressure: the first parameter, `Single` type, this is output parameter, It is Engine Air Filter 1 Differential Pressure in kPa.

Returns

`Boolean`

5.5.11 Inner Class PGN65271

5.5.11.1 Methods

```
Function refresh() As Result
Function getAlternatorVoltage(ByRef AlternatorVoltage As Single) As Boolean
Function getElectricalVoltage(ByRef ElectricalVoltage As Single) As Boolean
Function getBatteryVoltage(ByRef BatteryVoltage As Single) As Boolean
```

5.5.11.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65271.refresh() will refresh PGN65271 data from vehicle.It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you

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will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

Nothing

Returns

`Result`

5.5.11.1.2 getAlternatorVoltage Method

```
Function getAlternatorVoltage(ByRef AlternatorVoltage As Single) As Boolean
```

Description

PGN65271.getAlternatorVoltage will get Charging System Potential (Voltage). It will return true if success, otherwise return false.

Parameters

AlternatorVoltage: the first parameter, `Single` type, this is output parameter, It is Charging System Potential (Voltage).

Returns

`Boolean`

5.5.11.1.3 getElectricalVoltage Method

```
Function getElectricalVoltage(ByRef ElectricalVoltage As Single) As Boolean
```

Description

PGN65271.getElectricalVoltage will get Battery Potential / Power Input 1. It will return true if success, otherwise return false.

Parameters

ElectricalVoltage: the first parameter, `Single` type, this is output parameter, It is Battery Potential / Power Input 1.

Returns

`Boolean`

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5.5.11.1.4 getBatteryVoltage Method

```
Function getBatteryVoltage(ByRef BatteryVoltage As Single) As Boolean
```

Description

PGN65271.getBatteryVoltage will get Keyswitch Battery Potential. It will return true if success, otherwise return false.

Parameters

BatteryVoltage: the first parameter, `Single` type, this is output parameter, It is Keyswitch Battery Potential.

Returns

`Boolean`

5.5.12 Inner Class PGN65272

5.5.12.1 Methods

```
Function refresh() As Result
Function getTransmissionOilLevel(ByRef Percent As Single) As Boolean
Function getTransmissionOilLevelHighLow(ByRef HighLow As Single) As Boolean
Function getTransmissionOilPressure(ByRef Pressure As Single) As Boolean
Function getTransmissionOilTemp(ByRef Temperature As Single) As Boolean
```

5.5.12.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65272.refresh() will refresh PGN65272 data from vehicle. It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

Nothing

Returns

`Result`

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5.5.12.1.2 getTransmissionOilLevel Method

```
Function getTransmissionOilLevel(ByRef Percent As Single) As Boolean
```

Description

PGN65272.getTransmissionOilLevel will get Transmission Oil Level in percentage. It will return true if success, otherwise return false.

Parameters

Percent: the first parameter, `Single` type, this is output parameter, It is Transmission Oil Level in percentage.

Returns

`Boolean`

5.5.12.1.3 getTransmissionOilLevelHighLow Method

```
Function getTransmissionOilLevelHighLow(ByRef HighLow As Single) As Boolean
```

Description

PGN65272.getTransmissionOilLevelHighLow will get Amount of current volume of transmission sump oil compared to recommended volume. Positive values indicate overfill. Zero means the transmission fluild is filled to the recommended level. Unit is L. It will return true if success, otherwise return false.

Parameters

HighLow: the first parameter, `Single` type, this is output parameter, It is Amount of current volume of transmission sump oil compared to recommended volume. Unit is L.

Returns

`Boolean`

5.5.12.1.4 getTransmissionOilPressure Method

```
Function getTransmissionOilPressure(ByRef Pressure As Single) As Boolean
```

Description

PGN65272.getTransmissionOilPressure will get Transmission Oil Pressure in kPa. It will return true if success, otherwise return false.

Parameters

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Pressure: the first parameter, Single type, this is output parameter, It is Transmission Oil Pressure in kPa.

Returns
Boolean

5.5.12.1.5 getTransmissionOilTemp Method

```
Function getTransmissionOilTemp(ByRef Temperature As Single) As Boolean
```

Description

PGN65272.getTransmissionOilTemp will get Transmission Oil Temperature in Celsius degree. It will return true if success, otherwise return false.

Parameters

Temperature: the first parameter, Single type, this is output parameter, It is Transmission Oil Temperature in Celsius degree.

Returns
Boolean

5.5.13 Inner Class PGN65266

5.5.13.1 Methods

```
Function refresh() As Result
Function getFuelRate(ByRef FuelRate As Single) As Boolean
Function getInstantFuelEconomy(ByRef InstantFuelEconomy As Single) As Boolean
Function getAvgFuelEconomy(ByRef AvgFuelEconomy As Single) As Boolean
Function getEngineThrottlePos(ByRef EngineThrottlePos As Single) As Boolean
```

5.5.13.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65266.refresh() will refresh PGN65266 data from vehicle. It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

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Parameters

Nothing

Returns

`Result`

5.5.13.1.2 getFuelRate Method

```
Function getFuelRate(ByRef FuelRate As Single) As Boolean
```

Description

PGN65266.getFuelRate will get Engine Fuel Rate in L/H. It will return true if success, otherwise return false.

Parameters

FuelRate: the first parameter, `Single` type, this is output parameter, It is Engine Fuel Rate in L/H.

Returns

`Boolean`

5.5.13.1.3 getInstantFuelEconomy Method

```
Function getInstantFuelEconomy(ByRef InstantFuelEconomy As Single) As Boolean
```

Description

PGN65266.getInstantFuelEconomy will get Engine Instantaneous Fuel Economy in Km/L. It will return true if success, otherwise return false.

Parameters

InstantFuelEconomy: the first parameter, `Single` type, this is output parameter, It is Engine Instantaneous Fuel Economy in Km/L.

Returns

`Boolean`

5.5.13.1.4 getAvgFuelEconomy Method

```
Function getAvgFuelEconomy(ByRef AvgFuelEconomy As Single) As Boolean
```

Description

PGN65266.getAvgFuelEconomy will get Engine Average Fuel Economy in Km/L. It will return true if success, otherwise return false.

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Parameters

AvgFuelEconomy: the first parameter, `Single` type, this is output parameter, It is Engine Average Fuel Economy in Km/L.

Returns

`Boolean`

5.5.13.1.5 getEngineThrottlePos Method

```
Function getEngineThrottlePos(ByRef EngineThrottlePos As Single) As Boolean
```

Description

PGN65266.getEngineThrottlePos will get Engine Throttle Position in percentage. It will return true if success, otherwise return false.

Parameters

EngineThrottlePos: the first parameter, `Single` type, this is output parameter, It is Engine Throttle Position in percentage.

Returns

`Boolean`

5.5.14 Inner Class PGN65263

5.5.14.1 Methods

```
Function refresh() As Result
Function getFueDeliveryPressure(ByRef FueDeliveryPressure As Single) As Boolean
Function getEngineOilLevel(ByRef EngineOilLevel As Single) As Boolean
Function getEngineOilPressure(ByRef EngineOilPressure As Single) As Boolean
Function getEngineCoolantPressure(ByRef EngineCoolantPressure As Single)  _
                                  As Boolean
Function getEngineCoolantLevel(ByRef EngineCoolantLevel As Single) As Boolean
```

5.5.14.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65263.refresh() will refresh PGN65263 data from vehicle.It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

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Parameters

Nothing

Returns

`Result`

5.5.14.1.2 getFueDeliveryPressure Method

```
Function getFueDeliveryPressure(ByRef FueDeliveryPressure As Single) As Boolean
```

Description

PGN65263.getFueDeliveryPressure will get Engine Fuel Delivery Pressure in kPa. It will return true if success, otherwise return false.

Parameters

FueDeliveryPressure: the first parameter, `Single` type, this is output parameter, It is Engine Fuel Delivery Pressure in kPa.

Returns

`Boolean`

5.5.14.1.3 getEngineOilLevel Method

```
Function getEngineOilLevel(ByRef EngineOilLevel As Single) As Boolean
```

Description

PGN65263.getEngineOilLevel will get Engine Oil Level in percentage. It will return true if success, otherwise return false.

Parameters

EngineOilLevel: the first parameter, `Single` type, this is output parameter, It is Engine Oil Level in percentage

Returns

`Boolean`

5.5.14.1.4 getEngineOilPressure Method

```
Function getEngineOilPressure(ByRef EngineOilPressure As Single) As Boolean
```

Description

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PGN65263.getEngineOilPressure will get Engine Oil Pressure in kPa. It will return true if success, otherwise return false.

Parameters

EngineOilPressure: the first parameter, `Single` type, this is output parameter, It is Engine Oil Pressure in kPa.

Returns

`Boolean`

5.5.14.1.5 getEngineCoolantPressure Method

```
Function getEngineCoolantPressure(ByRef EngineCoolantPressure As Single)  _
                                  As Boolean
```

Description

PGN65263.getEngineCoolantPressure will get Engine Coolant Pressure in kPa. It will return true if success, otherwise return false.

Parameters

EngineCoolantPressure: the first parameter, `Single` type, this is output parameter, It is Engine Coolant Pressure in kPa.

Returns

`Boolean`

5.5.14.1.6 getEngineCoolantLevel Method

```
Function getEngineCoolantLevel(ByRef EngineCoolantLevel As Single) As Boolean
```

Description

PGN65263.getEngineCoolantLevel will get Engine Coolant Level in percentage. It will return true if success, otherwise return false.

Parameters

EngineCoolantLevel: the first parameter, `Single` type, this is output parameter, It is Engine Coolant Level in percentage

Returns

`Boolean`

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5.5.15 Inner Class PGN65253

5.5.15.1 Methods

```
Function refresh() As Result
Function getTotalEngineHours(ByRef TotalEngineHours As Single) As Boolean
Function getTotalEngineRevolutions(ByRef TotalEngineRevolutions As Single)  _
                                   As Boolean
```

5.5.15.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65253.refresh() will refresh PGN65253 data from vehicle. It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

Nothing

Returns

`Result`

5.5.15.1.2 getTotalEngineHours Method

```
Function getTotalEngineHours(ByRef TotalEngineHours As Single) As Boolean
```

Description

PGN65253.getTotalEngineHours will get Engine Total Hours of Operation. It will return true if success, otherwise return false.

Parameters

TotalEngineHours: the first parameter, `Single` type, this is output parameter, It is Engine Total Hours of Operation.

Returns

`Boolean`

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5.5.15.1.3 getTotalEngineRevolutions Method

```
Function getTotalEngineRevolutions(ByRef TotalEngineRevolutions As Single)  _
                                   As Boolean
```

Description

PGN65253.getTotalEngineRevolutions will get Engine Total Revolutions. Unit is r. It will return true if success, otherwise return false.

Parameters

TotalEngineRevolutions: the first parameter, `Single` type, this is output parameter, It is Engine Total Revolutions. Unit is r.

Returns

`Boolean`

5.5.16 Inner Class PGN65214

5.5.16.1 Methods

```
Function refresh() As Result
Function getRatedEngineSpeed(ByRef RatedEngineSpeed As Single) As Boolean
```

5.5.16.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65214.refresh() will refresh PGN65214 data from vehicle. It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

Nothing

Returns

`Result`

5.5.16.1.2 getRatedEngineSpeed Method

```
Function getRatedEngineSpeed(ByRef RatedEngineSpeed As Single) As Boolean
```

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Description

PGN65214.getRatedEngineSpeed will get Engine Rated Speed in rpm. Unit is r. It will return true if success, otherwise return false.

Parameters

RatedEngineSpeed: the first parameter, `Single` type, this is output parameter, It is Engine Rated Speed in rpm.

Returns

`Boolean`

5.5.17 Inner Class PGN65248

5.5.17.1 Methods

```
Function refresh() As Result
Function getTripDistance(ByRef TripDistance As Single) As Boolean
Function getTotalDistance(ByRef TotalDistance As Single) As Boolean
```

5.5.17.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65248.refresh() will refresh PGN65248 data from vehicle.It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

Nothing

Returns

`Result`

5.5.17.1.2 getTripDistance Method

```
Function getTripDistance(ByRef TripDistance As Single) As Boolean
```

Description

PGN65248.getTripDistance will get Trip Distance in Km. It will return true if success, otherwise

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return false.

Parameters

TripDistance: the first parameter, `Single` type, this is output parameter, It is Trip Distance in Km.

Returns

`Boolean`

5.5.17.1.3 getTotalDistance Method

```
Function getTotalDistance(ByRef TotalDistance As Single) As Boolean
```

Description

PGN65248.getTotalDistance will get Total Vehicle Distance in Km. It will return true if success, otherwise return false.

Parameters

TotalDistance: the first parameter, `Single` type, this is output parameter, It is Total Vehicle Distance in Km.

Returns

`Boolean`

5.5.18 Inner Class PGN65276

5.5.18.1 Methods

```
Function refresh() As Result
Function getWasherFluidLevel(ByRef WasherFluidLevel As Single) As Boolean
Function getFuelLevel1(ByRef FuelLevel1 As Single) As Boolean
Function getFuelLevel2(ByRef FuelLevel2 As Single) As Boolean
```

5.5.18.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65276.refresh() will refresh PGN65276 data from vehicle.It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

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Parameters

Nothing

Returns

`Result`

5.5.18.1.2 getWasherFluidLevel Method

```
Function getWasherFluidLevel(ByRef WasherFluidLevel As Single) As Boolean
```

Description

PGN65276.getWasherFluidLevel will get Washer Fluid Level in percentage. It will return true if success, otherwise return false.

Parameters

WasherFluidLevel: the first parameter, `Single` type, this is output parameter, It is Washer Fluid Level in percentage

Returns

`Boolean`

5.5.18.1.3 getFuelLevel1 Method

```
Function getFuelLevel1(ByRef FuelLevel1 As Single) As Boolean
```

Description

PGN65276.getFuelLevel1 will get Fuel Level 1 in percentage. It will return true if success, otherwise return false.

Parameters

FuelLevel1: the first parameter, `Single` type, this is output parameter, It is Fuel Level 1 in percentage

Returns

`Boolean`

5.5.18.1.4 getFuelLevel2 Method

```
Function getFuelLevel2(ByRef FuelLevel2 As Single) As Boolean
```

Description

PGN65276.getFuelLevel2 will get Fuel Level 2 in percentage. It will return true if success, otherwise return false.

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Parameters

FuelLevel2: the first parameter, `Single` type, this is output parameter, It is Fuel Level 2 in percentage

Returns
`Boolean`

5.5.19 Inner Class PGN65265

5.5.19.1 Methods

```
Function refresh() As Result
Function getWheelBasedVehicleSpeed(ByRef WheelBasedVehicleSpeed As Single)  _
                                   As Boolean
```

5.5.19.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN65265.refresh() will refresh PGN65265 data from vehicle.It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

Nothing

Returns
`Result`

5.5.19.1.2 getWheelBasedVehicleSpeed Method

```
Function getWheelBasedVehicleSpeed(ByRef WheelBasedVehicleSpeed As Single)  _
                                   As Boolean
```

Description

PGN65265.getWheelBasedVehicleSpeed will get Wheel-Based Vehicle Speed in km/h. It will return true if success, otherwise return false.

Parameters

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WheelBasedVehicleSpeed: the first parameter, `Single` type, this is output parameter, It is Wheel-Based Vehicle Speed in km/h.

Returns
`Boolean`

5.5.20 Inner Class PGN57344

5.5.20.1 Methods

```
Function refresh() As Result
Function getSeatBelt(ByRef buckled As Boolean) As Boolean
```

5.5.20.1.1 refresh Method

```
Function refresh() As Result
```

Description

PGN57344.refresh() will refresh PGN57344 data from vehicle. It will return SUCCESS if succeed to get, otherwise return FAIL if fail in getting. It will return WAITING if dfl168A need more time, and you will call this method again later on. You cannot call the other method before you get SUCCESS or FAIL.

If you want to get latest vehicle data from the other methods in this PGN, you should call this method firstly.

Parameters

Nothing

Returns
`Result`

5.5.20.1.2 getSeatBelt Method

```
Function getSeatBelt(ByRef buckled As Boolean) As Boolean
```

Description

PGN57344.getWheelBasedVehicleSpeed will get status of Seat Belt Switch. It will return true if success, otherwise return false.

Parameters

buckled: the first parameter, `Boolean` type, this is output parameter, true means that Seat Belt is buckled, false means that Seat Belt is not buckled

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Returns
Boolean

5.6 Inner Class J1708

5.6.1 Methods

```
Function getAirPressure(ByRef AirPressure As Single) As Result
Function getEngineOilPressure(ByRef EngineOilPressure As Single) As Result
Function getEngineCoolantPressure(ByRef EngineCoolantPressure As Single)  _
                                  As Result
Function getFuelLevel1(ByRef FuelLevel1 As Single) As Result
Function getFuelLevel2(ByRef FuelLevel2 As Single) As Result
Function getBarometricPressure(ByRef Pressure As Single) As Result
Function getEngineThrottlePos(ByRef EngineThrottlePos As Single) As Result
Function getWasherFluidLevel(ByRef WasherFluidLevel As Single) As Result
Function getVehicleSpeed(ByRef VehicleSpeed As Single) As Result
Function getAccelPedalPosi1(ByRef AccelPedalPosi1 As Single) As Result
Function getAccelPedalPosi2(ByRef AccelPedalPosi2 As Single) As Result
Function getAccelPedalPosi3(ByRef AccelPedalPosi3 As Single) As Result
Function getEngineLoad(ByRef Percent As Single) As Result
Function getEngineOilLevel(ByRef EngineOilLevel As Single) As Result
Function getCoolantTemperature(ByRef temp As Single) As Result
Function getEngineCoolantLevel(ByRef EngineCoolantLevel As Single) As Result
Function getTransmissionOilLevel(ByRef Percent As Single) As Result
Function getTransmissionOilLevelHighLow(ByRef HighLow As Single) As Result
Function getTransmissionOilPressure(ByRef Pressure As Single) As Result
Function getTransmissionOilTemp(ByRef Temperature As Single) As Result
Function getPowerSpecificInstantFuelEconomy(ByRef Rate As Single) As Result
Function getAvgFuelRate(ByRef FuelRate As Single) As Result
Function getInstantFuelEconomy(ByRef InstantFuelEconomy As Single) As Result
Function getAvgFuelEconomy(ByRef AvgFuelEconomy As Single) As Result
Function getElectricalVoltage(ByRef BatteryVoltage As Single) As Result
Function getRatedEnginePower(ByRef Power As Single) As Result
Function getBatteryVoltage(ByRef BatteryVoltage As Single) As Result
Function getAlternatorVoltage(ByRef AlternatorVoltage As Single) As Result
Function getAmbientTemp(ByRef AmbientTemp As Single) As Result
Function getCargoAmbientTemp(ByRef CargoTemp As Single) As Result
Function getRoadTemp(ByRef RoadTemp As Single) As Result
Function getCabInteriorTemp(ByRef CabInteriorTemp As Single) As Result
Function getInletTemp(ByRef InletTemp As Single) As Result
Function getFuelTemp(ByRef temp As Single) As Result
Function getOilTemp(ByRef temp As Single) As Result
Function getCargoWeight(ByRef CargoW As Single) As Result
Function getEngineTripFuel(ByRef EngineTripFuel As Single) As Result
Function getEngineTotalFuelUsed(ByRef EngineTotalFuelUsed As Single) As Result
Function getFuelRate(ByRef FuelRate As Single) As Result
Function getRatedEngineSpeed(ByRef RatedEngineSpeed As Single) As Result
Function getEngineSpeed(ByRef EngineSpeed As Single) As Result
Function getIntakeManifoldTemp(ByRef IntakeManifoldTemp As Single) As Result
Function getPowerTakeoffStatus(ByRef PTOModeActive As Boolean,   _
                               ByRef ClutchSwitchOn As Boolean,  _
                               ByRef BrakeSwitchOn As Boolean,  _
```

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```
                                ByRef AccelSwitchOn As Boolean,  _
                                ByRef ResumeSwitchOn As Boolean,  _
                                ByRef CoastSwitchOn As Boolean,  _
                                ByRef SetSwitchOn As Boolean,  _
                                ByRef PTOControlSwitchOn As Boolean) As Result
Function getTripDistance(ByRef TripDistance As Single) As Result
Function getTotalDistance(ByRef TotalDistance As Single) As Result
Function getTotalEngineHours(ByRef TotalEngineHours As Single) As Result
Function getTotalEngineRevolutions(ByRef TotalEngineRevolutions As Single)  _
                                As Result
Function getVIN(ByRef VIN As String) As Result
Function getDTC(ByRef DTC_Num As Short, ByRef MID As Short,  _
              ByRef PID_SID() As Short, ByRef IsPID() As Boolean,  _
              ByRef FMI() As Short, ByRef IsActive() As Boolean,  _
              ByRef OccurrenceExist() As Boolean,  _
              ByRef OccurrenceCount() As Short) As Result
Function clearDTC(ByVal MID As Short, ByVal PID_SID As Short,  _
                ByVal IsPID As Boolean) As Result
Function getFaultDescription(ByVal MID As Short, ByVal PID_SID As Short,  _
                           ByVal IsPID As Boolean, ByVal FMI As Short,  _
                           ByRef FaultDescription As String) As Result
Function getPIDSIDDescription(ByVal MID As Short, ByVal PID_SID As Short,  _
                            ByVal IsPID As Boolean,  _
                            ByRef PID_SID_Description As String) As Result
```

If returned value is "WAITING", you must call the same methods again later on. In this situation, you cannot call the other method.

When you got returned value of "SUCCESS" or "FAIL", you can call the other method.

5.6.1.1 getAirPressure Method

```
Function getAirPressure(ByRef AirPressure As Single) As Result
```

Description

getAirPressure will get Gauge Pressure of air in system that utilizes compressed air to provide force between a lift axle and frame for purposes of
lifting or lowering the axle, unit is kPa. It will return true if success, otherwise return false.

Parameters

AirPressure: the first parameter, `Single` type, this is output parameter. It is Gauge Pressure of air in system in kPa.

Returns

`Result`

5.6.1.2 getEngineOilPressure Method

```
Function getEngineOilPressure(ByRef EngineOilPressure As Single) As Result
```

Description

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getEngineOilPressure will get Gauge pressure of oil in the engine lubrication system as provided by the oil pump, unit is kPa .It will return true if success, otherwise return false.

Parameters

EngineOilPressure: the first parameter, `Single` type, this is output parameter. It is Gauge pressure of oil in the engine lubrication system in kPa.

Returns

`Result`

5.6.1.3 getEngineCoolantPressure Method

```
Function getEngineCoolantPressure(ByRef EngineCoolantPressure As Single) As
Result
```

Description

getEngineCoolantPressure will get Gauge pressure of liquid found in the engine cooling system, unit is kPa .It will return true if success, otherwise return false.

Parameters

EngineCoolantPressure: the first parameter, `Single` type, this is output parameter. It is Gauge pressure of liquid found in the engine cooling system in kPa.

Returns

`Result`

5.6.1.4 getFuelLevel1 Method

```
Function getFuelLevel1(ByRef FuelLevel1 As Single) As Result
```

Description

getFuelLevel1 will get ratio of volume of fuel to the total volume of the primary fuel storage container. Unit is percentage. It will return true if success, otherwise return false.

Parameters

FuelLevel1: the first parameter,`Single` type, this is output parameter. It is ratio of volume of fuel to the total volume of the primary fuel storage container. Unit is percentage.

Returns

`Result`

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5.6.1.5 getFuelLevel2 Method

```
Function getFuelLevel2(ByRef FuelLevel2 As Single) As Result
```

Description

getFuelLevel2 will get ratio of volume of fuel to the total volume of the second fuel storage container. Unit is percentage. It will return true if success, otherwise return false.

Parameters

FuelLevel2: the first parameter,`Single` type, this is output parameter. It is ratio of volume of fuel to the total volume of the second fuel storage container. Unit is percentage.

Returns

`Result`

5.6.1.6 getBarometricPressure Method

```
Function getBarometricPressure(ByRef Pressure As Single) As Result
```

Description

getBarometricPressure will get absolute air pressure of the atmosphere in kPa. It will return true if success, otherwise return false.

Parameters

Pressure: the first parameter,`Single` type, this is output parameter. It is absolute air pressure of the atmosphere in kPa.

Returns

`Result`

5.6.1.7 getEngineThrottlePos Method

```
Function getEngineThrottlePos(ByRef EngineThrottlePos As Single) As Result
```

Description

getEngineThrottlePos will get the position of the valve used to regulate the supply of a fluid, usually air or fuel/air mixture, to an engine. 0% represents no supply and 100% is full supply. It will return true if success, otherwise return false.

Parameters

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EngineThrottlePos: the first parameter,Single type, this is output parameter. It is the position of the valve used to regulate the supply of a fluid. This is percentage.

Returns

Result

5.6.1.8 getWasherFluidLevel Method

```
Function getWasherFluidLevel(ByRef WasherFluidLevel As Single) As Result
```

Description

getWasherFluidLevel will get ratio of volume of liquid to total container volume of fluid reservoir in windshield wash system. It will return true if success, otherwise return false.

Parameters

WasherFluidLevel: the first parameter,Single type, this is output parameter. It is the ratio of volume of liquid to total container volume of fluid reservoir in windshield wash system. This is percentage.

Returns

Result

5.6.1.9 getVehicleSpeed Method

```
Function getVehicleSpeed(ByRef VehicleSpeed As Single) As Result
```

Description

getVehicleSpeed will get vehicle road speed in km/h. It will return true if success, otherwise return false.

Parameters

WasherFluidLevel: the first parameter,Single type, this is output parameter. It is vehicle road speed in km/h.

Returns

Result

5.6.1.10 getAccelPedalPosi1 Method

```
Function getAccelPedalPosi1(ByRef AccelPedalPosi1 As Single) As Result
```

Description

getAccelPedalPosi1 will get ratio of actual accelerator pedal position to maximum pedal position. It

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will return true if success, otherwise return false.

Parameters

AccelPedalPosi1: the first parameter,`Single` type, this is output parameter. It is the ratio of actual accelerator pedal position to maximum pedal position. This is percentage.

Returns

`Result`

5.6.1.11 getAccelPedalPosi2 Method

```
Function getAccelPedalPosi2(ByRef AccelPedalPosi2 As Single) As Result
```

Description

getAccelPedalPosi2 will get ratio of actual accelerator pedal position to maximum pedal position. It will return true if success, otherwise return false.

Parameters

AccelPedalPosi2: the first parameter,`Single` type, this is output parameter. It is the ratio of actual accelerator pedal position to maximum pedal position. This is percentage.

Returns

`Result`

5.6.1.12 getAccelPedalPosi3 Method

```
Function getAccelPedalPosi3(ByRef AccelPedalPosi3 As Single) As Result
```

Description

getAccelPedalPosi3 will get ratio of actual accelerator pedal position to maximum pedal position. It will return true if success, otherwise return false.

Parameters

AccelPedalPosi3: the first parameter,`Single` type, this is output parameter. It is the ratio of actual accelerator pedal position to maximum pedal position. This is percentage.

Returns

`Result`

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5.6.1.13 getEngineLoad Method

```
Function getEngineLoad(ByRef Percent As Single) As Result
```

Description

getEngineLoad will get ratio of current output torque to maximum torque available at the current engine speed. It will return true if success, otherwise return false.

Parameters

Percent: the first parameter,`Single` type, this is output parameter. It is the ratio of current output torque to maximum torque available at the current engine speed. This is percentage.

Returns

`Result`

5.6.1.14 getEngineOilLevel Method

```
Function getEngineOilLevel(ByRef EngineOilLevel As Single) As Result
```

Description

getEngineOilLevel will get ratio of current volume of engine sump oil to maximum required volume. It will return true if success, otherwise return false.

Parameters

EngineOilLevel: the first parameter,`Single` type, this is output parameter. It is the ratio of current volume of engine sump oil to maximum required volume. This is percentage.

Returns

`Result`

5.6.1.15 getCoolantTemperature Method

```
Function getCoolantTemperature(ByRef temp As Single) As Result
```

Description

getCoolantTemperature will get the temperature of liquid found in engine cooling system in Celsius degree. It will return true if success, otherwise return false.

Parameters

temp: the first parameter,`Single` type, this is output parameter. It is the temperature of liquid found

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in engine cooling system in Celsius degree.

Returns

Result

5.6.1.16 getEngineCoolantLevel Method

```
Function getEngineCoolantLevel(ByRef EngineCoolantLevel As Single) As Result
```

Description

getEngineCoolantLevel will get ratio of volume of liquid found in engine cooling system to total cooling system volume. It will return true if success, otherwise return false.

Parameters

EngineCoolantLevel: the first parameter,Single type, this is output parameter. It is the ratio of volume of liquid found in engine cooling system to total cooling system volume. This is percentage.

Returns

Result

5.6.1.17 getTransmissionOilLevel Method

```
Function getTransmissionOilLevel(ByRef Percent As Single) As Result
```

Description

getTransmissionOilLevel will get ratio of volume of transmission sump oil to recommended volume. It will return true if success, otherwise return false.

Parameters

Percent: the first parameter,Single type, this is output parameter. It is the ratio of volume of transmission sump oil to recommended volume. This is percentage.

Returns

Result

5.6.1.18 getTransmissionOilLevelHighLow Method

```
Function getTransmissionOilLevelHighLow(ByRef HighLow As Single) As Result
```

Description

getTransmissionOilLevelHighLow will get amount of current volume of transmission sump oil compared to recommended volume. Unit is L. It will return true if success, otherwise return false.

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Parameters

HighLow: the first parameter,`Single` type, this is output parameter. It is the amount of current volume of transmission sump oil compared to recommended volume. Unit is L.

Returns

`Result`

5.6.1.19 getTransmissionOilPressure Method

```
Function getTransmissionOilPressure(ByRef Pressure As Single) As Result
```

Description

getTransmissionOilPressure will get gage pressure of lubrication fluid in transmission, measured after pump in kPa. It will return true if success, otherwise return false.

Parameters

Pressure: the first parameter,`Single` type, this is output parameter. It is gage pressure of lubrication fluid in transmission, measured after pump in kPa.

Returns

`Result`

5.6.1.20 getTransmissionOilTemp Method

```
Function getTransmissionOilTemp(ByRef Temperature As Single) As Result
```

Description

getTransmissionOilTemp will get temperature of transmission lubricant in Celsius degree. It will return true if success, otherwise return false.

Parameters

Temperature: the first parameter,`Single` type, this is output parameter. It is the temperature of transmission lubricant in Celsius degree.

Returns

`Result`

5.6.1.21 getPowerSpecificInstantFuelEconomy Method

```
Function getPowerSpecificInstantFuelEconomy(ByRef Rate As Single) As Result
```

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Description

getPowerSpecificInstantFuelEconomy will get instantaneous fuel economy of the engine, typically for off-highway equipment in kWh/L. It will return true if success, otherwise return false.

Parameters

Rate: the first parameter, `Single` type, this is output parameter. It is the instantaneous fuel economy of the engine in kWh/L.

Returns

`Result`

5.6.1.22 getAvgFuelRate Method

```
Function getAvgFuelRate(ByRef FuelRate As Single) As Result
```

Description

getAvgFuelRate will get continuous averaging fuel per hour per segment of engine operation in L/s. It will return true if success, otherwise return false.

Parameters

FuelRate: the first parameter, `Single` type, this is output parameter. It is the continuous averaging fuel per hour per segment of engine operation in L/s.

Returns

`Result`

5.6.1.23 getInstantFuelEconomy Method

```
Function getInstantFuelEconomy(ByRef InstantFuelEconomy As Single) As Result
```

Description

getInstantFuelEconomy will get current fuel economy at current vehicle velocity in Km/L. It will return true if success, otherwise return false.

Parameters

InstantFuelEconomy: the first parameter, `Single` type, this is output parameter. It is the current fuel economy at current vehicle velocity in Km/L.

Returns

`Result`

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5.6.1.24 getAvgFuelEconomy Method

```
Function getAvgFuelEconomy(ByRef AvgFuelEconomy As Single) As Result
```

Description

getAvgFuelEconomy will get average of instantaneous fuel economy for that segment of vehicle operation of interest in Km/L. It will return true if success, otherwise return false.

Parameters

AvgFuelEconomy: the first parameter, `Single` type, this is output parameter. It is the Average of instantaneous fuel economy for that segment of vehicle operation of interest in Km/L.

Returns

`Result`

5.6.1.25 getElectricalVoltage Method

```
Function getElectricalVoltage(ByRef BatteryVoltage As Single) As Result
```

Description

getElectricalVoltage will get electrical potential measured at the input of the electronic control unit supplied through a switching device. It will return true if success, otherwise return false.

Parameters

BatteryVoltage: the first parameter, `Single` type, this is output parameter. It is the electrical potential measured at the input of the electronic control unit supplied through a switching device.

Returns

`Result`

5.6.1.26 getRatedEnginePower Method

```
Function getRatedEnginePower(ByRef Power As Single) As Result
```

Description

getRatedEnginePower will get net brake power that the engine will deliver continuously, specified for a given application at a rated speed in KW. It will return true if success, otherwise return false.

Parameters

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Power: the first parameter, Single type, this is output parameter. It is the net brake power that the engine will deliver continuously, specified for a given application at a rated speed in KW.

Returns

Result

5.6.1.27 getBatteryVoltage Method

```
Function getBatteryVoltage(ByRef BatteryVoltage As Single) As Result
```

Description

getBatteryVoltage will get measured electrical potential of the battery. It will return true if success, otherwise return false.

Parameters

BatteryVoltage: the first parameter, Single type, this is output parameter. It is the measured electrical potential of the battery.

Returns

Result

5.6.1.28 getAlternatorVoltage Method

```
Function getAlternatorVoltage(ByRef AlternatorVoltage As Single) As Result
```

Description

getAlternatorVoltage will get measured electrical potential of the alternator. It will return true if success, otherwise return false.

Parameters

AlternatorVoltage: the first parameter, Single type, this is output parameter. It is the measured electrical potential of the alternator.

Returns

Result

5.6.1.29 getAmbientTemp Method

```
Function getAmbientTemp(ByRef AmbientTemp As Single) As Result
```

Description

getAmbientTemp will get temperature of air surrounding vehicle in Celsius degree. It will return true if success, otherwise return false.

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Parameters

AmbientTemp: the first parameter,`Single` type, this is output parameter. It is the temperature of air surrounding vehicle in Celsius degree.

Returns

`Result`

5.6.1.30 getCargoAmbientTemp Method

```
Function getCargoAmbientTemp(ByRef CargoTemp As Single) As Result
```

Description

getCargoAmbientTemp will get temperature of air inside vehicle container used to accommodate cargo in Celsius degree. It will return true if success, otherwise return false.

Parameters

CargoTemp: the first parameter,`Single` type, this is output parameter. It is the temperature of air inside vehicle container used to accommodate cargo in Celsius degree.

Returns

`Result`

5.6.1.31 getRoadTemp Method

```
Function getRoadTemp(ByRef RoadTemp As Single) As Result
```

Description

getRoadTemp will get temperature of road surface over which vehicle is operating in Celsius degree. It will return true if success, otherwise return false.

Parameters

RoadTemp: the first parameter,`Single` type, this is output parameter. It is the temperature of road surface over which vehicle is operating in Celsius degree.

Returns

`Result`

5.6.1.32 getCabInteriorTemp Method

```
Function getCabInteriorTemp(ByRef CabInteriorTemp As Single) As Result
```

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Description

getCabInteriorTemp will get temperature of air inside the part of the vehicle that encloses the driver and vehicle operating controls in Celsius degree. It will return true if success, otherwise return false.

Parameters

CabInteriorTemp: the first parameter,`Single` type, this is output parameter. It is the temperature of air inside the part of the vehicle in Celsius degree.

Returns

`Result`

5.6.1.33 getInletTemp Method

```
Function getInletTemp(ByRef InletTemp As Single) As Result
```

Description

getInletTemp will get temperature of air entering vehicle air induction system in Celsius degree. It will return true if success, otherwise return false.

Parameters

InletTemp: the first parameter,`Single` type, this is output parameter. It is the temperature of air entering vehicle air induction system in Celsius degree.

Returns

`Result`

5.6.1.34 getFuelTemp Method

```
Function getFuelTemp(ByRef temp As Single) As Result
```

Description

getFuelTemp will get temperature of fuel entering injectors in Celsius degree. It will return true if success, otherwise return false.

Parameters

temp: the first parameter,`Single` type, this is output parameter. It is the temperature of fuel entering injectors in Celsius degree.

Returns

`Result`

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5.6.1.35 getOilTemp Method

```
Function getOilTemp(ByRef temp As Single) As Result
```

Description

getOilTemp will get temperature of engine lubricant in Celsius degree. It will return true if success, otherwise return false.

Parameters

temp: the first parameter,Single type, this is output parameter. It is the temperature of engine lubricant in Celsius degree.

Returns

Result

5.6.1.36 getCargoWeight Method

```
Function getCargoWeight(ByRef CargoW As Single) As Result
```

Description

getCargoWeight will get the force of gravity of freight carried in N. It will return true if success, otherwise return false.

Parameters

CargoW: the first parameter,Single type, this is output parameter. It is the force of gravity of freight carried in N.

Returns

Result

5.6.1.37 getEngineTripFuel Method

```
Function getEngineTripFuel(ByRef EngineTripFuel As Single) As Result
```

Description

getEngineTripFuel will get the fuel consumed during all or part of a journey in L. It will return true if success, otherwise return false.

Parameters

EngineTripFuel: the first parameter,Single type, this is output parameter. It is the fuel consumed

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during all or part of a journey in L.

Returns
Result

5.6.1.38 getEngineTotalFuelUsed Method

```
Function getEngineTotalFuelUsed(ByRef EngineTotalFuelUsed As Single) As Result
```

Description

getEngineTotalFuelUsed will get the accumulated amount of fuel used during vehicle operation in L. It will return true if success, otherwise return false.

Parameters

EngineTotalFuelUsed: the first parameter,Single type, this is output parameter. It is the accumulated amount of fuel used during vehicle operation in L.

Returns
Result

5.6.1.39 getFuelRate Method

```
Function getFuelRate(ByRef FuelRate As Single) As Result
```

Description

getFuelRate will get the amount of fuel consumed by engine per unit of time in L/s. It will return true if success, otherwise return false.

Parameters

FuelRate: the first parameter,Single type, this is output parameter. It is the amount of fuel consumed by engine per unit of time in L/s.

Returns
Result

5.6.1.40 getRatedEngineSpeed Method

```
Function getRatedEngineSpeed(ByRef RatedEngineSpeed As Single) As Result
```

Description

getRatedEngineSpeed will get the maximum governed rotational velocity of the engine crankshaft under full load conditions in rpm. It will return true if success, otherwise return false.

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Parameters

RatedEngineSpeed: the first parameter,`Single` type, this is output parameter. It is the maximum governed rotational velocity of the engine crankshaft under full load conditions in rpm.

Returns

`Result`

5.6.1.41 getEngineSpeed Method

```
Function getEngineSpeed(ByRef EngineSpeed As Single) As Result
```

Description

getEngineSpeed will get the rotational velocity of crankshaft in rpm. It will return true if success, otherwise return false.

Parameters

EngineSpeed: the first parameter,`Single` type, this is output parameter. It is the rotational velocity of crankshaft in rpm.

Returns

`Result`

5.6.1.42 getIntakeManifoldTemp Method

```
Function getIntakeManifoldTemp(ByRef IntakeManifoldTemp As Single) As Result
```

Description

getIntakeManifoldTemp will get the temperature of precombustion air found in intake manifold of engine air supply system in Celsius degree. It will return true if success, otherwise return false.

Parameters

IntakeManifoldTemp: the first parameter,`Single` type, this is output parameter. It is the temperature of precombustion air found in intake manifold of engine air supply system in Celsius degree.

Returns

`Result`

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5.6.1.43 getPowerTakeoffStatus Method

```
Function getPowerTakeoffStatus(ByRef PTOModeActive As Boolean,  _
                               ByRef ClutchSwitchOn As Boolean,  _
                               ByRef BrakeSwitchOn As Boolean,  _
                               ByRef AccelSwitchOn As Boolean,  _
                               ByRef ResumeSwitchOn As Boolean,  _
                               ByRef CoastSwitchOn As Boolean,  _
                               ByRef SetSwitchOn As Boolean,  _
                               ByRef PTOControlSwitchOn As Boolean) As Result
```

Description

getPowerTakeoffStatus will get the state of the system used to transmit engine power to auxiliary equipment. It will return true if success, otherwise return false.

Parameters

PTOModeActive: the first parameter,Boolean type, this is output parameter. It is PTO mode. True means "active", False means "not active"

ClutchSwitchOn: the second parameter,Boolean type, this is output parameter. It is clutch switch. True means "On", False means "Off"

BrakeSwitchOn: the third parameter,Boolean type, this is output parameter. It is brake switch. True means "On", False means "Off"

AccelSwitchOn: the fourth parameter,Boolean type, this is output parameter. It is accel switch. True means "On", False means "Off"

ResumeSwitchOn: the 5th parameter,Boolean type, this is output parameter. It is resume switch. True means "On", False means "Off"

CoastSwitchOn: the 6th parameter,Boolean type, this is output parameter. It is coast switch. True means "On", False means "Off"

SetSwitchOn: the 7th parameter,Boolean type, this is output parameter. It is set switch. True means "On", False means "Off"

PTOControlSwitchOn: the 8th parameter,Boolean type, this is output parameter. It is PTO control switch. True means "On", False means "Off"

Returns

Result

5.6.1.44 getTripDistance Method

```
Function getTripDistance(ByRef TripDistance As Single) As Result
```

Description

getTripDistance will get the distance traveled during all or part of a journey in Km. It will return true if

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success, otherwise return false.

Parameters

TripDistance: the first parameter,`Single` type, this is output parameter. It is the distance traveled during all or part of a journey in Km.

Returns

`Result`

5.6.1.45 getTotalDistance Method

```
Function getTotalDistance(ByRef TotalDistance As Single) As Result
```

Description

getTotalDistance will get the accumulated distance travelled by vehicle during its operation in Km. It will return true if success, otherwise return false.

Parameters

TotalDistance: the first parameter,`Single` type, this is output parameter. It is the accumulated distance travelled by vehicle during its operation in Km.

Returns

`Result`

5.6.1.46 getTotalEngineHours Method

```
Function getTotalEngineHours(ByRef TotalEngineHours As Single) As Result
```

Description

getTotalEngineHours will get the accumulated time of operation of engine in hours. It will return true if success, otherwise return false.

Parameters

TotalEngineHours: the first parameter,`Single` type, this is output parameter. It is the accumulated time of operation of engine in hours.

Returns

`Result`

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5.6.1.47 getTotalEngineRevolutions Method

```
Function getTotalEngineRevolutions(ByRef TotalEngineRevolutions As Single) _
                                   As Result
```

Description

getTotalEngineRevolutions will get the accumulated number of revolutions of engine crankshaft during its operation. It will return true if success, otherwise return false.

Parameters

TotalEngineRevolutions: the first parameter,`Single` type, this is output parameter. It is the accumulated number of revolutions of engine crankshaft during its operation.

Returns

`Result`

5.6.1.48 getVIN Method

```
Function getVIN(ByRef VIN As String) As Result
```

Description

getVIN will get the Vehicle Identification Number (VIN) as assigned by the vehicle manufacturer. It will return true if success, otherwise return false.

Parameters

VIN: the first parameter,`String` type, this is output parameter. It is the Vehicle Identification Number.

Returns

`Result`

5.6.1.49 getDTC Method

```
Function getDTC(ByRef DTC_Num As Short, ByRef MID As Short,  _
                ByRef PID_SID() As Short, ByRef IsPID() As Boolean,  _
                ByRef FMI() As Short, ByRef IsActive() As Boolean,  _
                ByRef OccurrenceExist() As Boolean,  _
                ByRef OccurrenceCount() As Short) As Result
```

Description

getDTC will get the diagnostic code and occurrence count. It will return true if success, otherwise return false.

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Parameters

DTC_Num: the first parameter, Short type, this is output parameter. It is the quantity of DTC. The first DTC will be in index 0 of array, The second will be in index 1 of array, ..., Maximum of 8 DTCs

MID: the second parameter, Short type, this is output parameter. It is MID of DTC.

PID_SID[8]: the third parameter, Short array type, this is output parameter. It is SID or PID of a standard diagnostic code. The next parameter will decide it is SID or PID.

IsPID[8]: the fourth parameter, Boolean array type, this is output parameter. It will tell us whether above parameter PID_SID[8] is PID. True means "PID", False means "SID"

FMI[8]: the 5th parameter, Short array type, this is output parameter. It will tell us Failure mode identifier (FMI) of a standard diagnostic code.

IsActive)[8]: the 6th parameter, Boolean array type, this is output parameter. It will tell us whether fault is active. True means "active", False means "inactive"

OccurrenceExist[8]: the 7th parameter, Boolean array type, this is output parameter. It will tell whether the next parameter OccurrenceCount exists. True means "exist", False means "not exist"

OccurrenceCount[8]: the 8th parameter, Short array type, this is output parameter. It will tell occurrence count for this diagnostic code

Returns

Result

5.6.1.50 clearDTC Method

```
Function clearDTC(ByVal MID As Short, ByVal PID_SID As Short,  _
                  ByVal IsPID As Boolean) As Result
```

Description

clearDTC will be used to clear diagnostic codes on the device with

the given MID, PID or SID. It will return true if success, otherwise return false.

Parameters

MID: the first parameter,Short type, this is input parameter. It is the MID of device which some special DTC will be cleared..

PID_SID: the second parameter,Short type, this is input parameter. It is the PID or SID which will be cleared. The next parameter will decide PID or SID.

IsPID: the third parameter,Boolean type, this is input parameter. It is used to identify the above parameter PID_SID. True means "PID", False means "SID"

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Returns

Result

5.6.1.51 getFaultDescription Method

```
Function getFaultDescription(ByVal MID As Short, ByVal PID_SID As Short,  _
                             ByVal IsPID As Boolean, ByVal FMI As Short,  _
                             ByRef FaultDescription As String) As Result
```

Description

getFaultDescription will be used to get DTC description string on the device with the given MID, PID or SID, and FMI. It will return true if success, otherwise return false.

Parameters

MID: the first parameter,Short type, this is input parameter. It is the MID of device which some special PID or SID and FMI will be described..

PID_SID: the second parameter,Short type, this is input parameter. It is the PID or SID. The next parameter will decide PID or SID.

IsPID: the third parameter,Boolean type, this is input parameter. It is used to identify the above parameter PID_SID. True means "PID", False means "SID"

FMI: the 4th parameter,Short type, this is input parameter. It is FMI of DTC which needs to be described.

FaultDescription: the 5th parameter,String type, this is output parameter. It is the string of described .DTC.

Returns

Result

5.6.1.52 getPIDSIDDescription Method

```
Function getPIDSIDDescription(ByVal MID As Short, ByVal PID_SID As Short,  _
                              ByVal IsPID As Boolean,  _
                              ByRef PID_SID_Description As String) As Result
```

Description

getPIDSIDDescription will be used to get PID or SID description string on the device with the given MID. It will return true if success, otherwise return false.

Parameters

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MID: the first parameter,Short type, this is input parameter. It is the MID of device which some special PID or SID will be described..

PID_SID: the second parameter,Short type, this is input parameter. It is the PID or SID. The next parameter will decide PID or SID.

IsPID: the third parameter,Boolean type, this is input parameter. It is used to identify the above parameter PID_SID. True means "PID", False means "SID"

PID_SID_Description: the 4th parameter,String type, this is output parameter. It is the string of described PID or SID.

Returns

Result

5.7 Inner Class ISO15765

5.7.1 Methods

```
Function getCoolantTemperature(ByRef temp As Single) As Result
Function getEngineSpeed(ByRef EngineSpeed As Single) As Result
Function getVehicleSpeed(ByRef VehicleSpeed As Single) As Result
Function getIntakeManifoldPressure(ByRef IntakeManifoldPressure As Single)  _
                                   As Result
Function getFuelSystemStatus(ByRef A_Openloop As Boolean,  _
                             ByRef A_Closedloop As Boolean, _
                             ByRef A_OpenloopByDriving_Con As Boolean,  _
                             ByRef A_OpenloopByFault As Boolean,  _
                             ByRef A_ClosedloopButFault As Boolean,  _
                             ByRef B_Openloop As Boolean,  _
                             ByRef B_Closedloop As Boolean, _
                             ByRef B_OpenloopByDriving_Con As Boolean,  _
                             ByRef B_OpenloopByFault As Boolean,  _
                             ByRef B_ClosedloopButFault As Boolean) As Result
Function getCalculatedLoadValue(ByRef CalculatedLoad As Single) As Result
Function getShortTermFuelTrimBank13(ByRef Bank1 As Single, ByRef Bank3 As Single
)  _
                                    As Result
Function getLongTermFuelTrimBank13(ByRef Bank1 As Single, ByRef Bank3 As Single)
```

```
_
                                    As Result
  Function getShortTermFuelTrimBank24(ByRef Bank2 As Single, ByRef Bank4 As Single
)  _
                                    As Result
  Function getLongTermFuelTrimBank24(ByRef Bank2 As Single, ByRef Bank4 As Single)
_
                                    As Result
  Function getIgnitionTimingAdvance(ByRef Angle As Single) As Result
  Function getIntakeAirTemperature(ByRef temp As Single) As Result
  Function getAirFlowRateFrmMAF(ByRef FlowRate As Single) As Result
  Function getAbsThrottlePosition(ByRef Percent As Single) As Result
  Function getOxygenSensorLocation(ByRef Bank1_Sensor1Present As Boolean,  _
                                   ByRef Bank1_Sensor2Present As Boolean,  _
                                   ByRef Bank1_Sensor3Present As Boolean,  _
                                   ByRef Bank1_Sensor4Present As Boolean,  _
                                   ByRef Bank3_Sensor1Present As Boolean,  _
                                   ByRef Bank3_Sensor2Present As Boolean, _
                                   ByRef Bank2_Sensor1Present As Boolean, _
                                   ByRef Bank2_Sensor2Present As Boolean, _
                                   ByRef Bank2_Sensor3Present As Boolean,  _
                                   ByRef Bank2_Sensor4Present As Boolean,  _
                                   ByRef Bank4_Sensor1Present As Boolean,  _
                                   ByRef Bank4_Sensor2Present As Boolean) As Result
  Function getBank1OSensor1Voltage(ByRef OutVoltage As Single) As Result
  Function getBank1OSensor2Voltage(ByRef OutVoltage As Single) As Result
  Function getBank1OSensor3Voltage(ByRef OutVoltage As Single) As Result
  Function getBank1OSensor4Voltage(ByRef OutVoltage As Single) As Result
  Function getBank2OSensor1Voltage(ByRef OutVoltage As Single) As Result
  Function getBank2OSensor2Voltage(ByRef OutVoltage As Single) As Result
  Function getBank2OSensor3Voltage(ByRef OutVoltage As Single) As Result
  Function getBank2OSensor4Voltage(ByRef OutVoltage As Single) As Result
  Function getBank3OSensor1Voltage(ByRef OutVoltage As Single) As Result
  Function getBank3OSensor2Voltage(ByRef OutVoltage As Single) As Result
  Function getBank4OSensor1Voltage(ByRef OutVoltage As Single) As Result
  Function getBank4OSensor2Voltage(ByRef OutVoltage As Single) As Result
  Function getOBDCertified(ByRef OBD As String) As Result
```

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```
Function getTimeSinceEngineStart(ByRef TotalTime As Single) As Result
Function getDistanceTraveledMIL(ByRef Distance As Single) As Result
Function getFuelRailPressure(ByRef Pressure As Single) As Result
Function getFuelLevelInput(ByRef Percent As Single) As Result
Function getDistanceTraveledSinceDTC_Clear(ByRef Distance As Single) As Result
Function getBarometricPressure(ByRef Pressure As Single) As Result
Function getControlModuleVoltage(ByRef Voltage As Single) As Result
Function getRelativeThrottlePosition(ByRef Percent As Single) As Result
Function getAmbientTemp(ByRef AmbientTemp As Single) As Result
Function getCommandedThrottleActuatorControl(ByRef Percent As Single) As Result
Function getEngineRunTimeMIL(ByRef TotalTime As Single) As Result
Function getEngineRunTimeSinceDTC_Clear(ByRef TotalTime As Single) As Result
Function getTypeOfFuelUsedCurrently(ByRef FuelType As String) As Result
Function getRelativeAcceleratorPedalPosition(ByRef Percent As Single) As Result
Function getHybridBatteryPackRemainingLife(ByRef Percent As Single) As Result
Function getEngineOilTemperature(ByRef Tem As Single) As Result
Function getFuelRate(ByRef FuelRate As Single) As Result
Function getActualEngineTorque(ByRef ActualEngineTorque As Single) As Result
Function getMILStatus(ByRef MIL_IS_ON As Boolean) As Result
Function getEngineRunTime(ByVal TotalEngineRunTime As Single,  _
                          ByRef TotalIdleRunTime As Single, _
                          ByRef TotalRunTimeWithPTOActive As Single) As Result
Function getVIN(ByRef VIN As String) As Result
Function getDTC(ByRef DTC_Num As Short, ByRef DTC() As String) As Result
Function clearDTC() As Result
```

Returned value can be one of "SUCCESS","FAIL", and "WAITING".

If returned value is "WAITING", you must call the same methods again later on. In this situation, you cannot call the other method.

When you got returned value of "SUCCESS" or "FAIL", you can call the other method.

5.7.1.1 getCoolantTemperature Method

```
Function getCoolantTemperature(ByRef temp As Single) As Result
```

Description

getCoolantTemperature will get engine coolant temperature in Celsius degree. It will return true if success, otherwise return false.

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Parameters

temp: the first parameter, `Single` type, this is output parameter. It is engine coolant temperature in Celsius degree.

Returns

`Result`

5.7.1.2 getEngineSpeed Method

```
Function getEngineSpeed(ByRef EngineSpeed As Single) As Result
```

Description

getEngineSpeed will get revolutions per minute of the engine crankshaft. It will return true if success, otherwise return false.

Parameters

EngineSpeed: the first parameter, `Single` type, this is output parameter. It is the revolutions per minute of the engine crankshaft.

Returns

`Result`

5.7.1.3 getVehicleSpeed Method

```
Function getVehicleSpeed(ByRef VehicleSpeed As Single) As Result
```

Description

getVehicleSpeed will get vehicle road speed in Km/h. It will return true if success, otherwise return false.

Parameters

VehicleSpeed: the first parameter, `Single` type, this is output parameter. It is the vehicle road speed in Km/h.

Returns

`Result`

5.7.1.4 getIntakeManifoldPressure Method

```
Function getIntakeManifoldPressure(ByRef IntakeManifoldPressure As Single) _
                                   As Result
```

Description

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getIntakeManifoldPressure will get manifold pressure derived from a Manifold Absolute Pressure sensor in kPa. It will return true if success, otherwise return false.

Parameters

IntakeManifoldPressure: the first parameter, `Single` type, this is output parameter. It is the manifold pressure in kPa.

Returns

`Result`

5.7.1.5 getFuelSystemStatus Method

```
Function getFuelSystemStatus(ByRef A_Openloop As Boolean,  _
                             ByRef A_Closedloop As Boolean,  _
                             ByRef A_OpenloopByDriving_Con As Boolean,  _
                             ByRef A_OpenloopByFault As Boolean,  _
                             ByRef A_ClosedloopButFault As Boolean, _
                              ByRef B_Openloop As Boolean,  _
                             ByRef B_Closedloop As Boolean,  _
                             ByRef B_OpenloopByDriving_Con As Boolean,  _
                             ByRef B_OpenloopByFault As Boolean,  _
                             ByRef B_ClosedloopButFault As Boolean) As Result
```

Description

getFuelSystemStatus will get fuel system status. It will return true if success, otherwise return false.

Parameters

A_Openloop: the first parameter, `Boolean` type, this is output parameter. True means "fuel system 1: Open loop" , It means that it has not yet satisfied conditions to go closed loop

A_Closedloop: the second parameter, `Boolean` type, this is output parameter. True means " fuel system 1: Closed loop" , It means that it is using oxygen sensor(s) as feedback for fuel control.

A_OpenloopByDriving_Con: the third parameter, `Boolean` type, this is output parameter. True means "fuel system1: Open loop due to driving conditions (e.g.power enrichment, deceleration enleanment)"

A_OpenloopByFault: the 4th parameter, `Boolean` type, this is output parameter. True means "fuel system1: Open loop - due to detected system fault"

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A_ClosedloopButFault: the 5th parameter, Boolean type, this is output parameter. True means "fuel system1: Closed loop, but fault with at least one oxygen sensor - may be using single oxygen sensor for fuel control"

B_Openloop: the 6th parameter, Boolean type, this is output parameter. True means "fuel system 2: Open loop" , It means that it has not yet satisfied conditions to go closed loop

B_Closedloop: the 7th parameter, Boolean type, this is output parameter. True means " fuel system 2: Closed loop" , It means that it is using oxygen sensor(s) as feedback for fuel control.

B_OpenloopByDriving_Con: the 8th parameter, Boolean type, this is output parameter. True means "fuel system2: Open loop due to driving conditions (e.g.power enrichment, deceleration enleanment)"

B_OpenloopByFault: the 9th parameter, Boolean type, this is output parameter. True means "fuel system2: Open loop - due to detected system fault"

B_ClosedloopButFault: the 10th parameter, Boolean type, this is output parameter. True means "fuel system2: Closed loop, but fault with at least one oxygen sensor - may be using single oxygen sensor for fuel control"

Returns

Result

5.7.1.6 getCalculatedLoadValue Method

```
Function getCalculatedLoadValue(ByRef CalculatedLoad As Single) As Result
```

Description

getCalculatedLoadValue will get calculated LOAD Value in percentage. It will return true if success, otherwise return false.

Parameters

CalculatedLoad: the first parameter, Single type, this is output parameter. It is the calculated LOAD Value in percentage.

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Returns

Result

5.7.1.7 getShortTermFuelTrimBank13 Method

```
Function getShortTermFuelTrimBank13(ByRef Bank1 As Single, ByRef Bank3 As Single)
_
                                    As Result
```

Description

getShortTermFuelTrimBank13 will get short term fuel trim in percentage. It will return true if success, otherwise return false.

Parameters

Bank1: the first parameter, Single type, this is output parameter. It is the short term fuel trim - Bank 1 in percentage.

Bank3: the first parameter, Single type, this is output parameter. It is the short term fuel trim - Bank 3 in percentage.

Returns

Result

5.7.1.8 getLongTermFuelTrimBank13 Method

```
Function getLongTermFuelTrimBank13(ByRef Bank1 As Single, ByRef Bank3 As Single)
_
                                    As Result
```

Description

getLongTermFuelTrimBank13 will get long term fuel trim in percentage. It will return true if success, otherwise return false.

Parameters

Bank1: the first parameter, Single type, this is output parameter. It is the long term fuel trim - Bank 1 in percentage.

Bank3: the first parameter, Single type, this is output parameter. It is the long term fuel trim - Bank 3 in percentage.

Returns

Result

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5.7.1.9 getShortTermFuelTrimBank24 Method

```
Function getShortTermFuelTrimBank24(ByRef Bank2 As Single, ByRef Bank4 As Single)
_
                                    As Result
```

Description

getShortTermFuelTrimBank24 will get short term fuel trim in percentage. It will return true if success, otherwise return false.

Parameters

Bank2: the first parameter, `Single` type, this is output parameter. It is the short term fuel trim - Bank 2 in percentage.

Bank4: the first parameter, `Single` type, this is output parameter. It is the short term fuel trim - Bank 4 in percentage.

Returns

`Result`

5.7.1.10 getLongTermFuelTrimBank24 Method

```
Function getLongTermFuelTrimBank24(ByRef Bank2 As Single, ByRef Bank4 As Single)
_
                                    As Result
```

Description

getLongTermFuelTrimBank24 will get long term fuel trim in percentage. It will return true if success, otherwise return false.

Parameters

Bank2: the first parameter, `Single` type, this is output parameter. It is the long term fuel trim - Bank 2 in percentage.

Bank4: the first parameter, `Single` type, this is output parameter. It is the long term fuel trim - Bank 4 in percentage.

Returns

`Result`

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5.7.1.11 getIgnitionTimingAdvance Method

```
Function getIgnitionTimingAdvance(ByRef Angle As Single) As Result
```

Description

getIgnitionTimingAdvance will get Ignition timing spark advance in degrees before top dead center (° BTDC) for #1 cylinder (not including mechanical advance). It will return true if success, otherwise return false.

Parameters

Angle: the first parameter, `Single` type, this is output parameter. It is the Ignition Timing Advance for #1 Cylinder in degree.

Returns

`Result`

5.7.1.12 getIntakeAirTemperature Method

```
Function getIntakeAirTemperature(ByRef temp As Single) As Result
```

Description

getIntakeAirTemperature will get intake manifold air temperature in Celsius degree. It will return true if success, otherwise return false.

Parameters

temp: the first parameter, `Single` type, this is output parameter. It is the intake manifold air temperature in Celsius degree.

Returns

`Result`

5.7.1.13 getAirFlowRateFrmMAF Method

```
Function getAirFlowRateFrmMAF(ByRef FlowRate As Single) As Result
```

Description

getAirFlowRateFrmMAF will get air flow rate from mass air flow sensor in g/s. It will return true if success, otherwise return false.

Parameters

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FlowRate: the first parameter, `Single` type, this is output parameter. It is the air flow rate from mass air flow sensor in g/s.

Returns

`Result`

5.7.1.14 getAbsThrottlePosition Method

```
Function getAbsThrottlePosition(ByRef Percent As Single) As Result
```

Description

getAbsThrottlePosition will get absolute throttle position in percentage. It will return true if success, otherwise return false.

Parameters

Percent: the first parameter, `Single` type, this is output parameter. It is the absolute throttle position in percentage.

Returns

`Result`

5.7.1.15 getOxygenSensorLocation Method

```
Function getOxygenSensorLocation(ByRef Bank1_Sensor1Present As Boolean,  _
                                 ByRef Bank1_Sensor2Present As Boolean, _
                                 ByRef Bank1_Sensor3Present As Boolean,  _
                                 ByRef Bank1_Sensor4Present As Boolean, _
                                 ByRef Bank3_Sensor1Present As Boolean,  _
                                 ByRef Bank3_Sensor2Present As Boolean, _
                                  ByRef Bank2_Sensor1Present As Boolean,  _
                                 ByRef Bank2_Sensor2Present As Boolean, _
                                 ByRef Bank2_Sensor3Present As Boolean,  _
                                 ByRef Bank2_Sensor4Present As Boolean, _
                                 ByRef Bank4_Sensor1Present As Boolean,  _
                                 ByRef Bank4_Sensor2Present As Boolean)  _
                                 As Result
```

Description

getOxygenSensorLocation will get location of oxygen sensors. It will return true if success, otherwise return false.

Parameters

Bank1_Sensor1Present: the first parameter, `Boolean` type, this is output parameter. True mans Bank 1 - Sensor 1 present at that location.

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Bank1_Sensor2Present: the 2nd parameter, Boolean type, this is output parameter. True mans Bank 1 - Sensor 2 present at that location.

Bank1_Sensor3Present: the 3rd parameter, Boolean type, this is output parameter. True mans Bank 1 - Sensor 3 present at that location.

Bank1_Sensor4Present: the 4th parameter, Boolean type, this is output parameter. True mans Bank 1 - Sensor 4 present at that location.

Bank3_Sensor1Present: the 5th parameter, Boolean type, this is output parameter. True mans Bank 3 - Sensor 1 present at that location.

Bank3_Sensor2Present: the 6th parameter, Boolean type, this is output parameter. True mans Bank 3 - Sensor 2 present at that location.

Bank2_Sensor1Present: the 7th parameter, Boolean type, this is output parameter. True mans Bank 2 - Sensor 1 present at that location.

Bank2_Sensor2Present: the 8th parameter, Boolean type, this is output parameter. True mans Bank 2 - Sensor 2 present at that location.

Bank2_Sensor3Present: the 9th parameter, Boolean type, this is output parameter. True mans Bank 2 - Sensor 3 present at that location.

Bank2_Sensor4Present: the 10th parameter, Boolean type, this is output parameter. True mans Bank 2 - Sensor 4 present at that location.

Bank4_Sensor1Present: the 11th parameter, Boolean type, this is output parameter. True mans Bank 4 - Sensor 1 present at that location.

Bank4_Sensor2Present: the 12th parameter, Boolean type, this is output parameter. True mans Bank 4 - Sensor 2 present at that location.

Returns

Result

5.7.1.16 getBank1OSensor1Voltage Method

```
Function getBank1OSensor1Voltage(ByRef OutVoltage As Single) As Result
```

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Description

getBank1OSensor1Voltage will get 0 to 1 volt oxygen sensor for Bank 1 – Sensor 1. It will return true if success, otherwise return false.

Parameters

OutVoltage: the first parameter, `Single` type, this is output parameter. It is the voltage value of oxygen sensor for Bank 1 – Sensor 1

Returns

`Result`.

5.7.1.17 getBank1OSensor2Voltage Method

```
Function getBank1OSensor2Voltage(ByRef OutVoltage As Single) As Result
```

Description

getBank1OSensor2Voltage will get 0 to 1 volt oxygen sensor for Bank 1 – Sensor 2. It will return true if success, otherwise return false.

Parameters

OutVoltage: the first parameter, `Single` type, this is output parameter. It is the voltage value of oxygen sensor for Bank 1 – Sensor 2

Returns

`Result`.

5.7.1.18 getBank1OSensor3Voltage Method

```
Function getBank1OSensor3Voltage(ByRef OutVoltage As Single) As Result
```

Description

getBank1OSensor3Voltage will get 0 to 1 volt oxygen sensor for Bank 1 – Sensor 3. It will return true if success, otherwise return false.

Parameters

OutVoltage: the first parameter, `Single` type, this is output parameter. It is the voltage value of oxygen sensor for Bank 1 – Sensor 3

Returns

`Result`.

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5.7.1.19 getBank1OSensor4Voltage Method

```
Function getBank1OSensor4Voltage(ByRef OutVoltage As Single) As Result
```

Description

getBank1OSensor4Voltage will get 0 to 1 volt oxygen sensor for Bank 1 – Sensor 4. It will return true if success, otherwise return false.

Parameters

OutVoltage: the first parameter, `Single` type, this is output parameter. It is the voltage value of oxygen sensor for Bank 1 – Sensor 4

Returns

`Result`.

5.7.1.20 getBank2OSensor1Voltage Method

```
Function getBank2OSensor1Voltage(ByRef OutVoltage As Single) As Result
```

Description

getBank2OSensor1Voltage will get 0 to 1 volt oxygen sensor for Bank 2 – Sensor 1. It will return true if success, otherwise return false.

Parameters

OutVoltage: the first parameter, `Single` type, this is output parameter. It is the voltage value of oxygen sensor for Bank 2 – Sensor 1

Returns

`Result`.

5.7.1.21 getBank2OSensor2Voltage Method

```
Function getBank2OSensor2Voltage(ByRef OutVoltage As Single) As Result
```

Description

getBank2OSensor2Voltage will get 0 to 1 volt oxygen sensor for Bank 2 – Sensor 2. It will return true if success, otherwise return false.

Parameters

OutVoltage: the first parameter, `Single` type, this is output parameter. It is the voltage value of

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oxygen sensor for Bank 2 – Sensor 2

Returns
Result.

5.7.1.22 getBank2OSensor3Voltage Method

```
Function getBank2OSensor3Voltage(ByRef OutVoltage As Single) As Result
```

Description

getBank2OSensor3Voltage will get 0 to 1 volt oxygen sensor for Bank 2 – Sensor 3. It will return true if success, otherwise return false.

Parameters

OutVoltage: the first parameter, Single type, this is output parameter. It is the voltage value of oxygen sensor for Bank 2 – Sensor 3

Returns
Result.

5.7.1.23 getBank2OSensor4Voltage Method

```
Function getBank2OSensor4Voltage(ByRef OutVoltage As Single) As Result
```

Description

getBank2OSensor4Voltage will get 0 to 1 volt oxygen sensor for Bank 2 – Sensor 4. It will return true if success, otherwise return false.

Parameters

OutVoltage: the first parameter, Single type, this is output parameter. It is the voltage value of oxygen sensor for Bank 2 – Sensor 4

Returns
Result.

5.7.1.24 getBank3OSensor1Voltage Method

```
Function getBank3OSensor1Voltage(ByRef OutVoltage As Single) As Result
```

Description

getBank3OSensor1Voltage will get 0 to 1 volt oxygen sensor for Bank 3 – Sensor 1. It will return true if success, otherwise return false.

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Parameters

OutVoltage: the first parameter, `Single` type, this is output parameter. It is the voltage value of oxygen sensor for Bank 3 – Sensor 1

Returns

`Result`.

5.7.1.25 getBank3OSensor2Voltage Method

```
Function getBank3OSensor2Voltage(ByRef OutVoltage As Single) As Result
```

Description

getBank3OSensor2Voltage will get 0 to 1 volt oxygen sensor for Bank 3 – Sensor 2. It will return true if success, otherwise return false.

Parameters

OutVoltage: the first parameter, `Single` type, this is output parameter. It is the voltage value of oxygen sensor for Bank 3 – Sensor 2

Returns

`Result`.

5.7.1.26 getBank4OSensor1Voltage Method

```
Function getBank4OSensor1Voltage(ByRef OutVoltage As Single) As Result
```

Description

getBank4OSensor1Voltage will get 0 to 1 volt oxygen sensor for Bank 4 – Sensor 1. It will return true if success, otherwise return false.

Parameters

OutVoltage: the first parameter, `Single` type, this is output parameter. It is the voltage value of oxygen sensor for Bank 4 – Sensor 1

Returns

`Result`

5.7.1.27 getBank4OSensor2Voltage Method

```
Function getBank4OSensor2Voltage(ByRef OutVoltage As Single) As Result
```

Description

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getBank4OSensor2Voltage will get 0 to 1 volt oxygen sensor for Bank 4 – Sensor 2. It will return true if success, otherwise return false.

Parameters

OutVoltage: the first parameter, `Single` type, this is output parameter. It is the voltage value of oxygen sensor for Bank 4 – Sensor 2

Returns

`Result`.

5.7.1.28 getOBDCertified Method

```
Function getOBDCertified(ByRef OBD As String) As Result
```

Description

getOBDCertified will get OBD requirements String to which vehicle or engine is certified.. It will return true if success, otherwise return false.

Parameters

OBD: the first parameter, String type, this is output parameter. It is the OBD certified String

Returns

`Result`.

5.7.1.29 getTimeSinceEngineStart Method

```
Function getTimeSinceEngineStart(ByRef TotalTime As Single) As Result
```

Description

getTimeSinceEngineStart will get time Since Engine Start in seconds. For non-hybrid vehicles, TotalTime shall increment while the engine is running. It shall freeze if the engine stalls. TotalTime shall be reset to zero during every control module power-up and when entering the key-on, engine off position. TotalTime is limited to 65535 seconds and shall not wrap around to zero. This function will return true if success, otherwise return false.

Parameters

TotalTime: the first parameter, unsigned `Single` type, this is output parameter. It is the time (Seconds) since engine start

Returns

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Result.

5.7.1.30 getDistanceTraveledMIL Method

```
Function getDistanceTraveledMIL(ByRef Distance As Single) As Result
```

Description

getDistanceTraveledMIL will get the distance (Km) traveled while MIL is activated. This function will return true if success, otherwise return false.

Parameters

Distance: the first parameter, unsigned Single type, this is output parameter. It is the distance (Km) traveled while MIL is activated

Returns

Result.

5.7.1.31 getFuelRailPressure Method

```
Function getFuelRailPressure(ByRef Pressure As Single) As Result
```

Description

getFuelRailPressure will get the fuel rail pressure (kPa) at the engine when the reading is referenced to atmosphere (gage pressure). This function will return true if success, otherwise return false.

Parameters

Pressure: the first parameter, Single type, this is output parameter. It is the fuel rail pressure in kPa.

Returns

Result.

5.7.1.32 getFuelLevelInput Method

```
Function getFuelLevelInput(ByRef Percent As Single) As Result
```

Description

getFuelLevelInput will get the nominal fuel tank liquid fill capacity as a percent of maximum. This function will return true if success, otherwise return false.

Parameters

Percent: the first parameter, Single type, this is output parameter. It is the fuel level input in

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percentage.

Returns
Result.

5.7.1.33 getDistanceTraveledSinceDTC_Clear Method

```
Function getDistanceTraveledSinceDTC_Clear(ByRef Distance As Single) As Result
```

Description

getDistanceTraveledSinceDTC_Clear will get the distance (Km) accumulated since DTCs were cleared (via external test equipment or possibly, a battery disconnect). This function will return true if success, otherwise return false.

Parameters

Distance: the first parameter, unsigned Single type, this is output parameter. It is the distance (Km) traveled since
DTCs cleared

Returns
Result.

5.7.1.34 getBarometricPressure Method

```
Function getBarometricPressure(ByRef Pressure As Single) As Result
```

Description

getBarometricPressure will get the barometric pressure in kPa. This function will return true if success, otherwise return false.

Parameters

Pressure: the first parameter, Single type, this is output parameter. It is the barometric pressure in kPa.

Returns
Result.

5.7.1.35 getControlModuleVoltage Method

```
Function getControlModuleVoltage(ByRef Voltage As Single) As Result
```

Description

getControlModuleVoltage will get the control module voltage. This function will return true if success, otherwise return false.

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Parameters

Voltage: the first parameter, `Single` type, this is output parameter. It is the control module voltage.

Returns

`Result`.

5.7.1.36 getRelativeThrottlePosition Method

```
Function getRelativeThrottlePosition(ByRef Percent As Single) As Result
```

Description

getRelativeThrottlePosition will get the relative throttle position in percentage. This function will return true if success, otherwise return false.

Parameters

Percent: the first parameter, `Single` type, this is output parameter. It is the relative throttle position in percentage.

Returns

`Result`.

5.7.1.37 getAmbientTemp Method

```
Function getAmbientTemp(ByRef AmbientTemp As Single) As Result
```

Description

getAmbientTemp will get the ambient air temperature in Celsius degree. This function will return true if success, otherwise return false.

Parameters

AmbientTemp: the first parameter, `Single` type, this is output parameter. It is the ambient air temperature in Celsius degree.

Returns

`Result`.

5.7.1.38 getCommandedThrottleActuatorControl Method

```
Function getCommandedThrottleActuatorControl(ByRef Percent As Single) As Result
```

Description

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getCommandedThrottleActuatorControl will get the commanded throttle actuator control in percentage. This function will return true if success, otherwise return false.

Parameters

Percent: the first parameter, `Single` type, this is output parameter. It is the commanded throttle actuator control in percentage.

Returns

`Result`.

5.7.1.39 getEngineRunTimeMIL Method

```
Function getEngineRunTimeMIL(ByRef TotalTime As Single) As Result
```

Description

getEngineRunTimeMIL will get the engine run time (minutes) while MIL is activated. This function will return true if success, otherwise return false.

Parameters

TotalTime: the first parameter, unsigned `Single` type, this is output parameter. It is the engine run time (minutes) while MIL is activated.

Returns

`Result`.

5.7.1.40 getEngineRunTimeSinceDTC_Clear Method

```
Function getEngineRunTimeSinceDTC_Clear(ByRef TotalTime As Single) As Result
```

Description

getEngineRunTimeSinceDTC_Clear will get the engine run time (minutes) since DTCs cleared. This function will return true if success, otherwise return false.

Parameters

TotalTime: the first parameter, unsigned `Single` type, this is output parameter. It is the engine run time (minutes) since DTCs cleared.

Returns

`Result`.

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5.7.1.41 getTypeOfFuelUsedCurrently Method

```
Function getTypeOfFuelUsedCurrently(ByRef FuelType As String) As Result
```

Description

getTypeOfFuelUsedCurrently will get the type of fuel currently being utilized by the vehicle. This function will return true if success, otherwise return false.

Parameters

FuelType: the first parameter, String type, this is output parameter. It is the type of fuel currently being utilized by the vehicle.

Returns

`Result`.

5.7.1.42 getRelativeAcceleratorPedalPosition Method

```
Function getRelativeAcceleratorPedalPosition(ByRef Percent As Single) As Result
```

Description

getRelativeAcceleratorPedalPosition will get the relative accelerator pedal position in percentage. This function will return true if success, otherwise return false.

Parameters

Percent: the first parameter, `Single` type, this is output parameter. It is the relative accelerator pedal position in percentage.

Returns

`Result`.

5.7.1.43 getHybridBatteryPackRemainingLife Method

```
Function getHybridBatteryPackRemainingLife(ByRef Percent As Single) As Result
```

Description

getHybridBatteryPackRemainingLife will get the percent remaining life for the hybrid battery pack. This function will return true if success, otherwise return false.

Parameters

Percent: the first parameter, `Single` type, this is output parameter. It is the percent remaining life for

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the hybrid battery pack.

Returns
Result.

5.7.1.44 getEngineOilTemperature Method

```
Function getEngineOilTemperature(ByRef Tem As Single) As Result
```

Description

getEngineOilTemperature will get the engine oil temperature in Celsius degree. This function will return true if success, otherwise return false.

Parameters

Tem: the first parameter, Single type, this is output parameter. It is the engine oil temperature in Celsius degree.

Returns
Result.

5.7.1.45 getFuelRate Method

```
Function getFuelRate(ByRef FuelRate As Single) As Result
```

Description

getFuelRate will get the amount of fuel consumed by engine per unit of time in liters per hour. This function will return true if success, otherwise return false.

Parameters

FuelRate: the first parameter, Single type, this is output parameter. It is the amount of fuel consumed by engine per unit of time in liters per hour.

Returns
Result.

5.7.1.46 getActualEngineTorque Method

```
Function getActualEngineTorque(ByRef ActualEngineTorque As Single) As Result
```

Description

getActualEngineTorque will get the actual engine - percent torque. This function will return true if success, otherwise return false.

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Parameters

ActualEngineTorque: the first parameter, `Single` type, this is output parameter. It is the actual engine - percent torque.

Returns

`Result`.

5.7.1.47 getMILStatus Method

```
Function getMILStatus(ByRef MIL_IS_ON As Boolean) As Result
```

Description

getMILStatus will get the Malfunction Indicator Lamp (MIL) status. This function will return true if success, otherwise return false.

Parameters

MIL_IS_ON: the first parameter, `Boolean` type, this is output parameter. True means MIL is ON

Returns

`Result`.

5.7.1.48 getEngineRunTime Method

```
Function getEngineRunTime(ByVal TotalEngineRunTime As Single,  _
                          ByRef TotalIdleRunTime As Single, _
                          ByRef TotalRunTimeWithPTOActive As Single) As Result
```

Description

getEngineRunTime will get the engine run time. This function will return true if success, otherwise return false.

Parameters

TotalEngineRunTime: the first parameter, `Single` type, this is output parameter. It is the total engine run time (Seconds) for the life of vehicle. It shall increment while the engine is running. It shall freeze if the engine stalls.It shall never be reset to zero.

TotalIdleRunTime: the first parameter, `Single` type, this is output parameter. It is the the total engine idle time (Seconds) for the life of vehicle. It shall increment while the engine is running at closed throttle/closed pedal and vehicle speed is less than 5 kph. It shall freeze if the engine stalls or the engine is no longer at idle. It shall never be reset to zero..

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TotalRunTimeWithPTOActive: the first parameter, Single type, this is output parameter. It is the total engine run time (Seconds) with PTO engaged for the life of vehicle. It shall increment while the engine is running with PTO engaged. It shall freeze if the engine stalls. It shall never be reset to zero..

Returns

Result.

5.7.1.49 getVIN Method

```
Function getVIN(ByRef VIN As String) As Result
```

Description

getVIN will get the Vehicle Identification Number (VIN) as assigned by the vehicle manufacturer. It will return true if success, otherwise return false.

Parameters

VIN: the first parameter,String type, this is output parameter. It is the Vehicle Identification Number.

Returns

Result.

5.7.1.50 getDTC Method

```
Function getDTC(ByRef DTC_Num As Short, ByRef DTC() As String) As Result
```

Description

getDTC will get all DTCs. It will return true if success, otherwise return false.

Parameters

DTC_Num: the first parameter, Short type, this is output parameter. It is the quantity of DTC. DTC_Num can be maximum of 8 because of hardware resource limited

DTC(): the second parameter, String array type, this is output parameter. It is the String of DTC. The first DTC will be in index 0 of array, The second will be in index 1 of array, ...,

Returns

Result.

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5.7.1.51 clearDTC Method

```
Function clearDTC() As Result
```

Description

clearDTC will clear all DTCs. It will return true if success, otherwise return false.

Parameters

Nothing

Returns
`Result`.

5.8 Inner Class GPS

5.8.1 Methods

```
Function getGPSinfo(ByRef Latitude As Single, ByRef Longitude As Single,  _
                    ByRef Speed As Single, ByRef TimeFrmGPS As String,  _
                    ByRef DateFrmGPS As String) As Result
Function getAltitude(ByRef Altitude As Single) As Result
```

Returned value can be one of "SUCCESS","FAIL", and "WAITING".

If returned value is "WAITING", you must call the same methods again later on. In this situation, you cannot call the other method.

When you got returned value of "SUCCESS" or "FAIL", you can call the other method.

5.8.1.1 getGPSinfo Method

```
Function getGPSinfo(ByRef Latitude As Single, ByRef Longitude As Single, _
                    ByRef Speed As Single, ByRef TimeFrmGPS As String, _
                    ByRef DateFrmGPS As String) As Result
```

Description

getGPSinfo will get GPS location and date and time information. It will return true if success, otherwise return false.

Parameters

Latitude: the first parameter, `Single` type, this is output parameter. It is the latitude of vehicle in degree. Plus is north, Minus is south.

Longitude: the 2nd parameter, `Single` type, this is output parameter. It is the Longitude of vehicle in degree. Plus is east, Minus is west.

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Speed: the 3rd parameter, `Single` type, this is output parameter. It is the vehicle speed based on GPS navigation in Km/h.

Time: the 4th parameter, `String` type, this is output parameter. It is the UTC time based on GPS navigation in Format "hh:mm::ss".

Date: the 5th parameter, `String` type, this is output parameter. It is the UTC date based on GPS navigation in Format "dd/mm/yyyy".

Returns

`Result`.

5.8.1.2 getAltitude Method

```
Function getAltitude(ByRef Altitude As Single) As Result
```

Description

getAltitude will get altitude of vehicle location. It will return true if success, otherwise return false.

Parameters

Altitude: the first parameter, `Single` type, this is output parameter. It is the altitude of vehicle in meter.

Returns

`Result`.

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