FUTEK USB LabVIEW 11 Example

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Requirements

To use the LabVIEW example with our USB devices you will need the following:

1.) A FUTEK USB device such as a USB210 or USB220.
2.) The LabVIEW example VI and dll file from the FUTEK website.
3.) LabVIEW version 9 or higher.
4.) The serial number stored in the USB device.
    - For an un-calibrated USB device the serial number is the number engraved on the metal connector of the USB device.
    - For a USB device that has been calibrated to a sensor, the serial number will be the number engraved on the sensor.
5.) The FUTEK LabVIEW VI and dll file should be stored together in the same folder in a local location, such as the desktop.

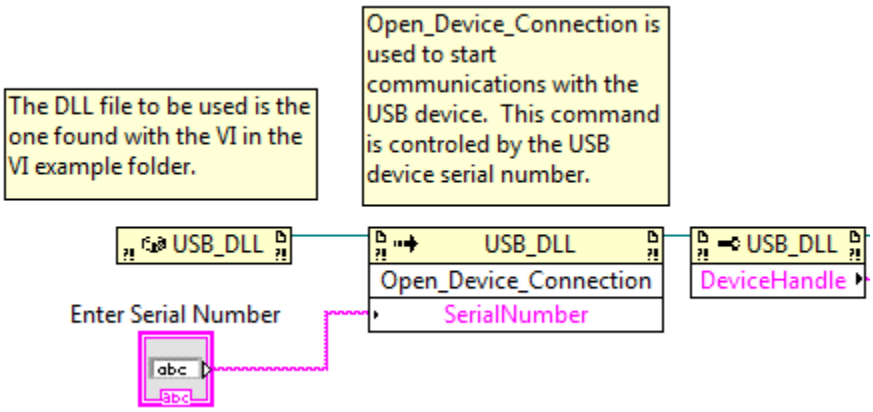
*NOTE: The stop function is a basic setup at the results stage. If the example needs to be stopped prior, or without the use of the built in stop, the USB device may need to be removed and re-inserted into the computer to re-initialize and clear communications.

Initializing Connections

From the .NET palette a constructor node is used to load the FUTEK dll file into the LabVIEW example.

The Open_Device_Connection method for the USB device is used to determine which USB device will receive the dll commands. This method requires the serial number stored in the USB device. The serial number is entered into the LabVIEW example through the use of the, "Enter Serial Number' control box. If an incorrect serial number is passed, and error will occur in the LabVIEW example.

DeviceHandle is a property of the USB device and is used to let the computer operating system know which USB device to communicate with.

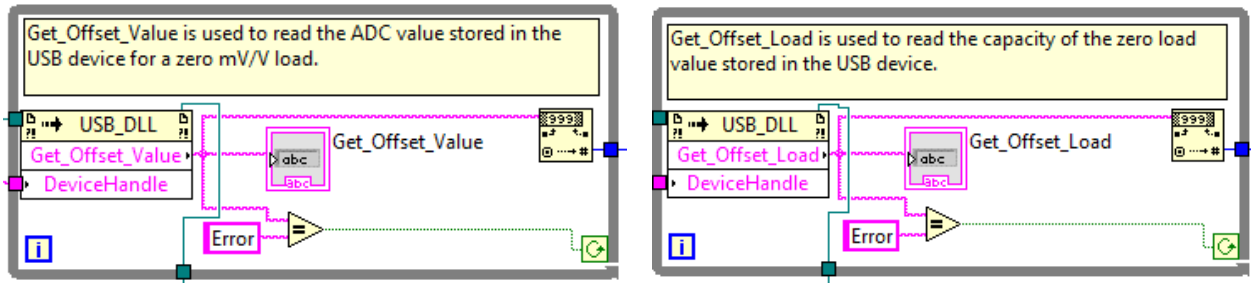


Reading "Zero" or "Low load" state

The method Get_Offset_Value is used to read the analog to digital converter reading stored in the USB device for a zero, or low load state.

The method Get_Offset_Load is used to read the engineering unit that corresponds to the analog to digital converter reading found from the method, Get_Offset_Value.

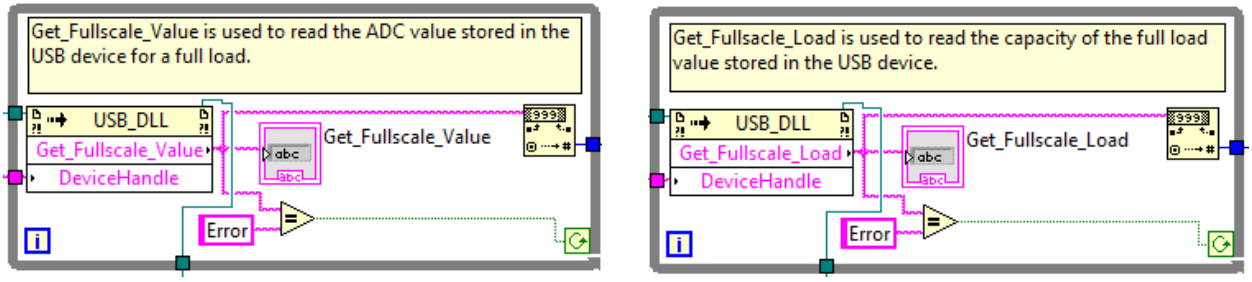
A USB device that has not been calibrated to a sensor, will have a factory 2mV/V calibration, and will have a zero value of 0 mV/V. A USB device that has been calibrated to a sensor, will have a calibration based on the output of the mated sensor, and will have a zero or low load state value in an engineering unit, such as lbs.



Reading "Full-scale" or "Full Load" state

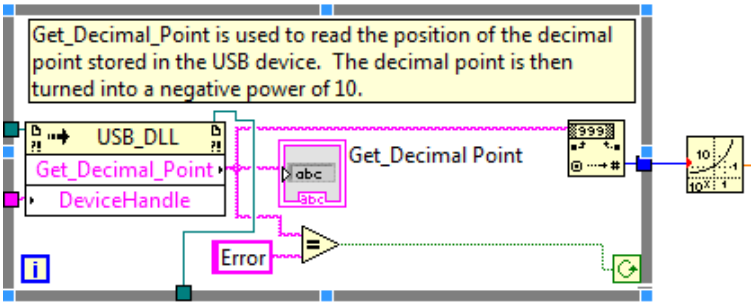
The method Get_Fullscale_Value is used to read the analog to digital converter reading stored in the USB device for a full-scale, or full load state.

The method Get_Fullscale_Load is used to read the engineering unit that corresponds to the analog to digital converter reading found from the method, Get_Fullscale_Value. For example, 100 may be returned for a 100lb sensor.



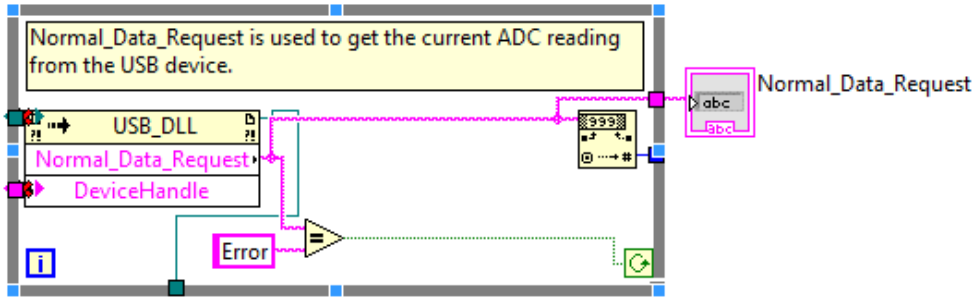
Reading and using the decimal point.

The method Get_Decimal_Point is used to read the value that corresponds to the placement of the decimal place. The decimal point value can become a factor of -10 which results in a multiplier in the final equation to correctly place the decimal place. For example, a reading of 3 would become a multiplier of -10^3.



Getting the current reading from the USB device.

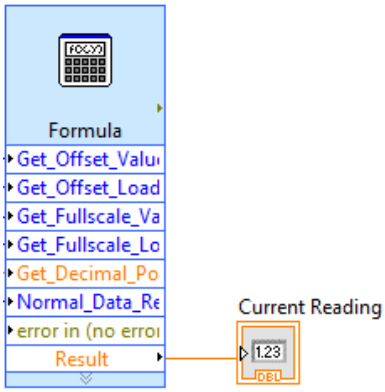
The method Normal_Data_Request is used to get the current analog to digital reading from the USB device.



Equation to calculate current reading

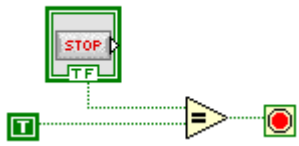
The Formula function found under Scripts & Formulas is used to calculate the current reading from the USB device. The formula used is:

(Normal_Data_Request-Get_Offset_Value)*((Get_Fullscale_Load-Get_Offset_Load)/(Get_Fullscale_Value-Get_Offset_Value))/Get_Decimal_Point



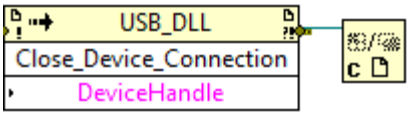
Ending and closing connections.

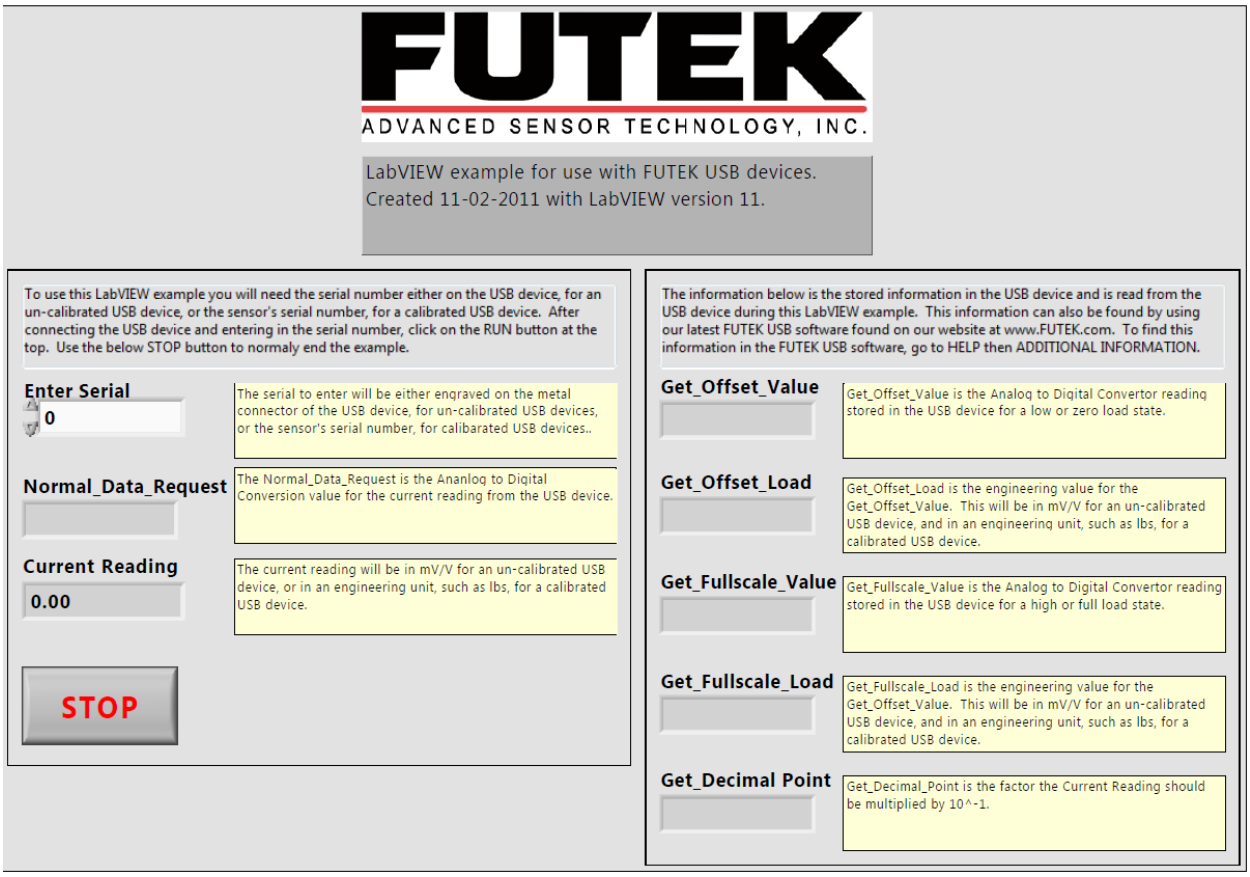
When the STOP button in pressed on the front panel, the while loop which contains the Normal_Data_Request, and Formula ends, and control is passed to the method Close_Device_Connection.

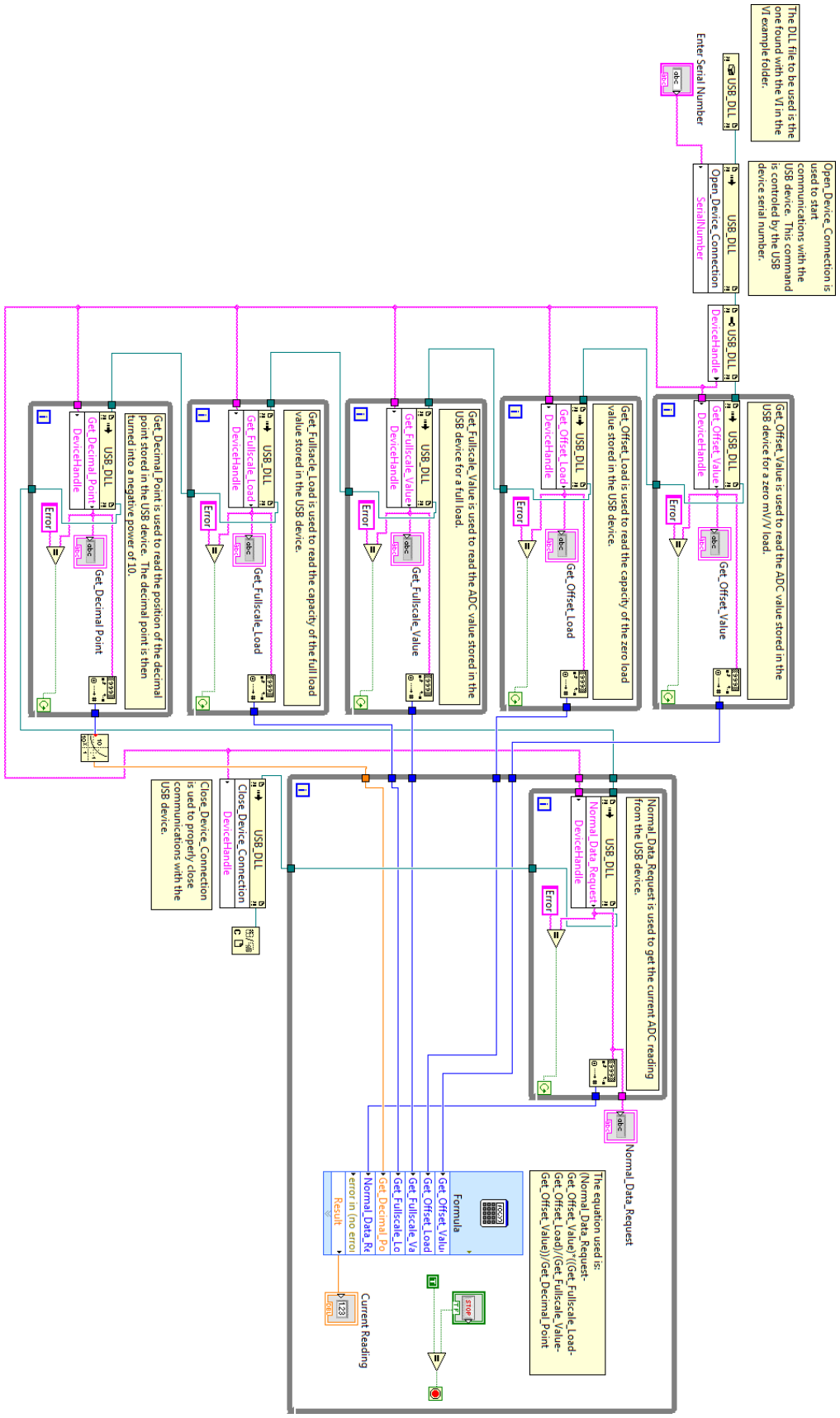


The method Close_Device_Connection is used to safely close communications with the USB device without leaving the USB device in an unknown state.

The close reference function found under Applications Control is used to close the .NET communications.






The DLL file to be used is the one found with the VI in the VI example folder.
Enter Serial Number
USB_DLL
Open_Device_Connection
SerialNumber
Open_Device_Connection is used to start communications with the USB device. This command is controled by the USB device serial number.
DeviceHandle
Get_Offset_Value is used to read the ADC value stored in the USB device for a zero mV/V load.
Get_Offset_Value
Get_Offset_Load is used to read the capacity of the zero load value stored in the USB device.
Get_Offset_Load
Get_Fullscale_Value is used to read the ADC value stored in the USB device for a full load.
Get_Fullscale_Value
Get_Fullscale_Load is used to read the capacity of the full load value stored in the USB device.
Get_Fullscale_Load
Get_Decimal_Point is used to read the position of the decimal point stored in the USB device. The decimal point is then turned into a negative power of 10.
Get_Decimal Point
Error
Normal_Data_Request is used to get the current ADC reading from the USB device.
Normal_Data_Request
Formula
Get_Offset_Valu
Get_Offset_Load
Get_Fullscale_Va
Get_Fullscale_Lo
Get_Decimal_Po
Normal_Data_Re
error in (no error)
Result
Current Reading
The equation used is:
(Normal_Data_Request-Get_Offset_Value)*((Get_Fullscale_Load-Get_Offset_Load)/(Get_Fullscale_Value-Get_Offset_Value))/Get_Decimal_Point
Close_Device_Connection is ued to properly close communications with the USB device.
Close_Device_Connection
STOP

Release Information

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