

LabVIEW Driver for GS4200 Sensor

Introduction

The term "LabVIEW driver" is widely used to describe a collection of functions, callable from LabVIEW, that enable the use of a particular sensor or instrument from LabVIEW. The language used to write the functions and the way in which they are packaged can take various routes. The driver for the GS4200 sensor will be a Windows DLL (dynamic link library) written in C++. This option has been chosen since it will give the shortest development time and lowest cost to ESI. The current and all recent versions of LabVIEW can all call DLLs. One version of the library will support all recent versions of LabVIEW.

Library Functions

This section lists the functions that will be implemented by the library. The LabVIEW code will control the sensor by calling these functions in the appropriate order.

Set-Up and Initialisation

Name FindSensor
Parameters int FirstPort
Returns An integer giving the port number of the detected sensor. This will be minus one if no sensor is found.
Comments This is called to find the port to which the sensor is connected. The first port to be tried is that specified in the input parameter.

Name Open
Parameters int PortNumber
Returns A status code showing success or error.
Comments Calling this function opens communications with the sensor connected to the specified port. An error is returned if no sensor is found.

Information

Name GetSerialNumber
Parameters None
Returns A string containing the sensor's serial number.
Comments This reads the sensor's serial number.

Name GetPressureRange
Parameters None
Returns The full scale range of the pressure sensor in bar gauge.
Comments This reads the sensor's serial number.

Name GetPressureUnits
Parameters int Units
Returns A units string.
Comments This function is given a units code and returns a string containing the units in text form.

Name GetTemperatureUnits
Parameters int Units
Returns A units string.
Comments This function is given a temperature units code and returns a string containing the units in text form.

Operation

Name Read
Parameters int Units, bool Absolute, double Temperature
Returns The pressure reading in the required units.
Comments This function reads and returns the pressure in the selected engineering units. The first parameter selects the choice of units from bar, mbar, psi, MPa, Pa, mH₂O, mmHg, atm, kgcm². The second parameter selects whether to return an absolute or a gauge reading. The final parameter is the temperature in Celsius.

Name ReadTemperature
Parameters int Units
Returns The temperature reading in the required units.
Comments This function reads and returns the temperature in the selected engineering units. The units can be set to be Celsius, Fahrenheit or Kelvin.

Name SetGaugeDifferential
Parameters double Differential
Returns None.
Comments This sets the difference between absolute and gauge pressures in bar. The value is used in the Read function when giving absolute values.

Clean-Up

Name Close
Parameters None
Returns A code indicating error or success.
Comments This function must be called when the application code has finished with the sensor. This closes communications and cleans up all system resources.

Error Handling

Name GetLastError
Parameters None
Returns A string giving a description of the last error.
Comments This function can be called when an error is returned from the driver. This returns a textual description of the error.

Deliverables

- At the end of the development the following items will be delivered to ESI.
- o The drivers DLL file, its include header (.h) file and its import library (.lib).
- o Source code.
- o Documentation describing the driver's functions and how to call them.
- o Instructions on how to import the library into LabVIEW.
- o Simple example application written in LabVIEW.