Using DGH D6200 Series Analog Input Modules with

DAQFactory HMI/SCADA Software

Create a low cost data acquisition system using a DGH D6200 4-20mA input module and the Azeotech DAQFactory Express HMI SCADA software. DAQFactory Express is a free HMI SCADA software program that collects data from up to eight channels and displays two HMI screens. DAQFactory Express also includes data logging to disk with date and time stamps using the ASCII comma delimited data format. More complex systems can be created using multiple D6000 series modules and a more advanced version of the DAQFactory software.

The DAQFactory Express version allows users to create a very low cost data acquisition system with an HMI SCADA software interface. A D6200 module combined with DAQFactory Express will allow users to measure seven 4-20mA input data channels, display the real time values in a trending line graph, display the real time data values in text format and store the data values to disk with a date and time stamp for future analysis.

A functional sample configuration file is available from DGH for use with a D6200 series module. Simply connect a D6200 series module (right out of the shipping box, no configuration required) to a computer serial port and run the sample file. Data logging will begin after specifying the proper serial port number in the file. The sample file "DGH_D6200_logging.ctl " is available for download at http://www.dghcorp.com/daqfactory. Use the steps below to specify the serial port number.

Configuration Steps:

1. Download and install DAQFactory Express at daqfactory.com.
2. Download the sample configuration file and store in the DAQFactory Express program\Samples folder.
3. Start the program.
4. At the main menu select File->Open->DGH_D6200_logging.ctl and press the "Open" button.
5. Specify the proper serial port
    - At the Main Menu select Quick->Device Configuration
    - Highlight D6200 and press the "Select" button
    - Check the box next to the left of D6200 and press the "Configure" button.
    - Enter the proper "Serial Port # (COM)" number that D6200 is connected to and press "Save".
    - **NOTE:** All remaining DAQFactory Express serial port parameters should remain at their default values (9600, 8, N, 1, No flow Control). This will allow a brand new D6200 series module with the same factory default serial values to be used with the "DGH_D6200_logging.ctl " file. No device setup changes required.
6. Scanning should start immediately after the serial port has been properly configured.

Local Configuration:

The "Local" configuration tree on the right side of the screen contains local channel connections, conversion formulas, disk file and display settings. Expand the individual branches of the tree to view the information in each section. Below are notes on each section and their significance.

Local->Connections

- Defines each channel being scanned
- Defines the graph colors, conversion formulas for each channel. Important for proper data scaling of each channel if using other D6000 series modules with this sample file.

1. Local->Conversion
   - Define the different data calculation formulas here
   - One calculation formula is specified here as converting RAW 16-bit unsigned integer Modbus register values to milliamps.
   - Critical to remember that the 16-bit unsigned value (0..65535) equates to the full scale input range of a D6200, which is -20ma to +20mA.
   - This single calculation formula is used by each "Channel" and specified in the "Channel" "Conversion" box.

2. Local->Logging
   - One entry "System_Channels" that specifies the channels written to disk and the formatting used.
   - The disk write includes Date and Time Stamp
   - The disk write outputs data values in "comma-delimited" ASCII format.

3. Local->Pages
   - Two pages are listed for use in DAQFactory Express
   - Page0 contains the D6200 series module data.
   - Page1 is available for user data.

Sample Configuration Notes:

1. Most importantly - this configuration file can also be used with other D6000 series analog input modules. The only significant changes that will be required are the scaling of raw Modbus data values from the module into the proper engineering units. D6000 series modules contain seven user-selectable channels and each channel can be programmed for a different analog input range. Therefore, the engineering units for each channel may not be the same as they are with a D6200 that contains seven fixed 4-20mA input channels.
   The channel ranges should be configured first using the DGH D6000 series utility software that is available on CD with an order. Then open DAQFactory Express and load the sample configuration file to specify the serial port number using the steps mentioned above.
   In order to display data values into engineering units then use conversion formulas are required to convert the raw Modbus data values to desired engineering units. For example, a D6300 series thermocouple input module measuring two different thermocouple types will require two new formulas (one for each type). Select "Conversions" in the right hand window and add the two new formulas. They will be similar to the existing formula that converts raw Modbus data to 4-20mA.
   After the formulas are created then apply each formula to the appropriate channel in the "Channels" property screens. Verify the data values at the bottom of the Page0 screen next to CH1..CH7.

Resources

D6000 Series

- Data Sheet: http://dghcorp.com/datasheets/D6000_Serial_Data_Sheet.pdf
- Users Manual: http://dghcorp.com/manuals/D6000_Users_Manual_Serial.pdf

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