12 Channel USB Data Acquisition System

Software - LFSDAQ

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1- Introduction

LFSDAQ is a data acquisition software for monitoring and logging up to 12 USB sensor boards (LFS108 & LFS104 series). First, install the application software. Simply download the software from the web site LookingForSolutions.com. Save the zipped file (LFSDAQ.zip) onto your desktop. Unzip the file. Run setup.exe to install the software. The software will place a shortcut of the program on the desktop.

You may need a USB Hub if connecting multiple sensor boards. Connect the boards to your PC USB ports or USB Hub with the cables provided. The PC will recognize the boards and will start installing the USB drivers. You can view the COM ports by going to the Device Manager/Ports. You can also install the USB drivers from the Device Manager/Port/Driver/Update Driver and point the PC to the USB driver directory on the desktop. Now you can run the software from the shortcut on the desktop.

Figure 1 shows the main screen. You can set the COM port for each sensor board. Click OFF button to open the port to the board. The program displays the model number for the board. You can set the Data Recording Rate (Time interval per data point) from the dropdown menu. Click the Start button. The program asks for the name of data file to be saved. You can name your data file (Filename.txt or Filename.csv) and the location where you want to save it. Click the Save (or Cancel) button. The program will start reading and displaying the sensor values from the boards and logging the data to the file name provided. The software also shows the running Elapsed time.

The temperature (Ambient Temp, Dew Point, Temp 1, Temp 2) can be displayed and saved in either Degrees Fahrenheit or Celsius by pressing the temperature engineering unit button. The Barometric Pressure can be displayed in different Engineering units by pressing the Barometric Pressure engineering unit.

When saving a data file (.txt or .csv), the program opens a file and saves up to 20,000 sets of data with date/time stamping, before closing the file and opening a new one.

Figure 1 – Main Screen

Figure 2 – Typical Help-About Screen

2- Settings Menu

Figure 3 shows the Settings Menu. You can Email saved data automatically to an email address provided. The program emails the saved data when it reaches up to 20,000 sets of data points. You can also send the first 16 set of data points to the Cloud – IoT (Thingspeak.com)

Figure 4 shows a typical .csv data file. The first 16 set of data points (DATA1 thru DATA16) can be sent to the cloud.

Figure 3 – Settings Menu

|	DATA1	DATA2	DATA3	DATA4	DATA5	DATA6	DATA7	DATA8	DATA9	DATA10	DATA11
Date/Time	Amb1(°F)	Temp1-1(°F)	Amb2(°F)	Humid2(%RH)	Bar Pres2(mbar)	Temp1-2(°F)	Amb3(°F)	Temp1-3(°F)	Amb4(°F)	Humid4(%RH)	Temp1-4(°F)
1/26/2020 15:19	37.6	70.2	37	11.1	992.1	69.4	38.6	70.7	37.8	14.7	65.3
1/26/2020 15:19	56.2	70.2	55.5	16.6	992.1	69.4	58	70.5	56.6	22	65.3
1/26/2020 15:19	65.7	70.2	64.8	19.4	992.1	69.4	67.6	70.7	66.2	25.7	65.4
1/26/2020 15:19	71	70.2	69.4	20.8	992.1	69.6	72.4	70.7	70.9	27.4	65.4
1/26/2020 15:19	73.4	70.2	71.7	21.5	992.1	69.5	74.8	70.7	73.4	28.4	65.4
1/26/2020 15:19	74.6	70.2	72.8	21.8	992.1	69.5	76	70.7	74.5	28.8	65.4
1/26/2020 15:19	75.1	70.2	73.4	21.8	992.1	69.6	76.6	70.7	75.2	28.8	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992	69.4	77	70.7	75.6	28.8	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.6	77.2	70.7	75.8	28.8	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.6	77.2	70.7	75.8	28.8	65.3
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.5	77.4	70.7	75.8	28.8	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.6	77.4	70.7	75.8	28.8	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.6	77.6	70.7	75.8	28.8	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.6	77.6	70.7	75.8	28.8	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.6	77.6	70.7	75.8	28.8	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.6	77.6	70.5	75.8	28.8	65.3
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.6	77.6	70.5	75.8	28.8	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.7	77.6	70.5	75.8	29.1	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.6	77.4	70.5	75.8	29.1	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.5	77.4	70.5	75.8	29.1	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.7	77.4	70.5	75.8	29.1	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.7	77.4	70.5	75.8	29.1	65.4
1/26/2020 15:19	75.1	70.2	73.7	21.8	992.1	69.7	77.4	70.7	75.8	29.1	65.4

Figure 4 – Typical .csv data file

3- Send Data to the Cloud – IoT (Thingspeak.com)

The software can send the first 16 sets of sensor data to Thingspeak.com web site for data storage and data visualization.

You need to create an account with Thingspeak.com. After login process, create a new Channel. The Channel can be either Public or Private. Fill in the Channel settings such as Name, Description, Field 1, Field 2, …., Field 8. Go to API keys tab and look for "Write API Key". Copy the API key code.

Go back to the settings menu software. Check off the "Send Data to the Cloud – Thingspeak.com" checkbox and enter (Paste) the API key in the first text box (API Key1). If you are sending more than 8 set of data points to the Cloud, you need to create a second Channel on Thingspeak site and fill in the Channel settings. Go to API keys tab and copy the Write API Key. Go back to the settings menu software and paste the API key in the second text box (API Key2). Click OK and go back to the main menu. Make sure the Recording Data Rate selection is at least 30 seconds or longer before starting the session.

Thingspeak.com provides many features such as data visualization and export, MATLAB analysis and Tweet alerts. Figure 5 shows a typical Thingspeak.com screens.
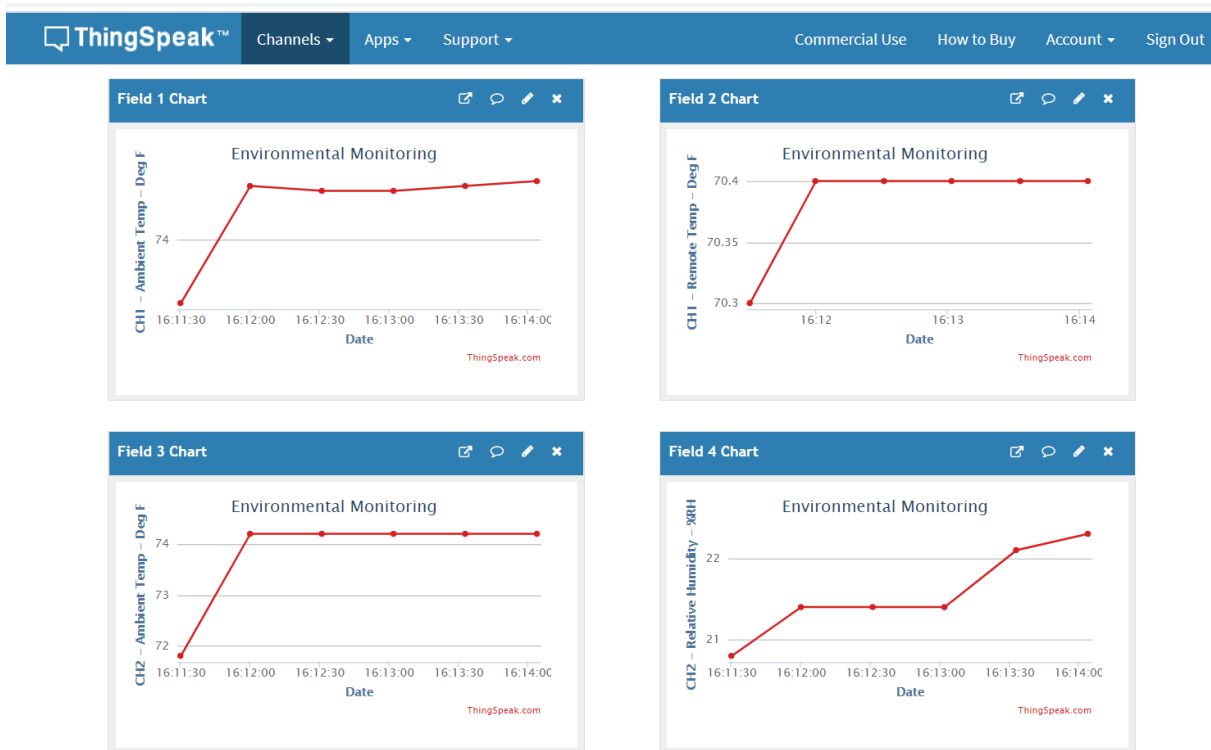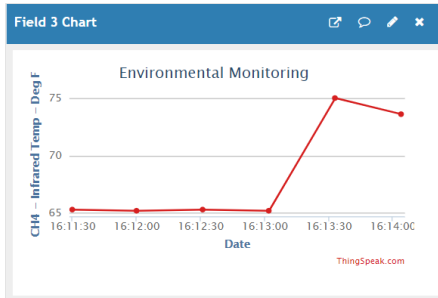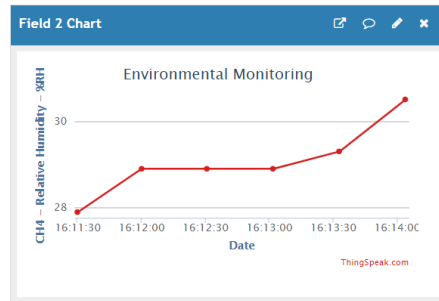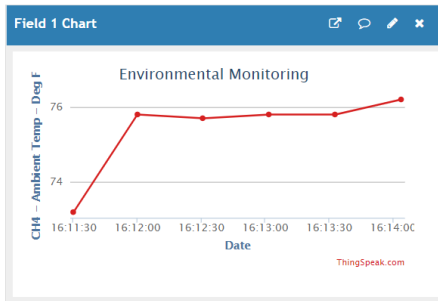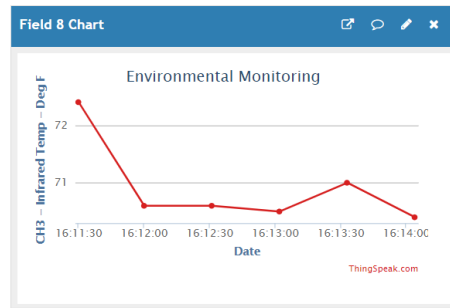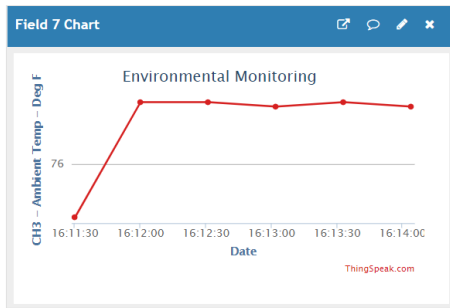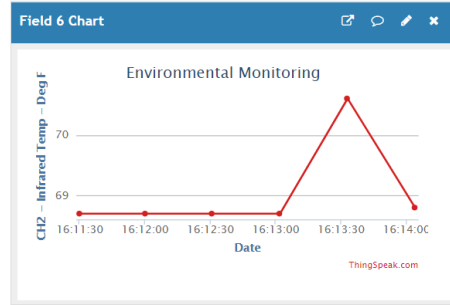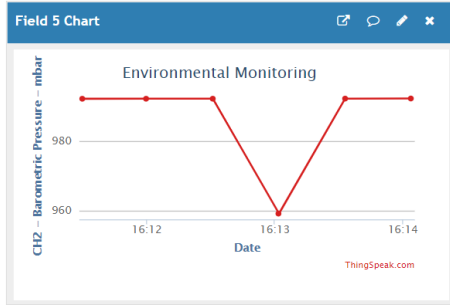
Figure 5 – Typical Thingspeak.com Screens

4- Saving Data to the Cloud Storage

You can save the temperature, relative humidity, and dew point data to any storage cloud service such as Google Drive, One Drive, Dropbox, etc. as follows:

- Install the storage cloud service app on your PC as well as your smart phone or Tablet.

- Run our PC application, and Start the data monitoring/logging session.

- Create a data file under the cloud storage folder (Google Drive, One Drive, etc.), name the data file, and click Save.

Your data file is now created in the cloud storage folder. After closing the data file, you can review the data from your smart phone or tablet.

5- Specifications

Sampling Time	1 sec, 5 sec, 10 sec, 30 sec, 1 minute
Recording Interval	1 sec, 5 sec, 10 sec, 30 sec, 1 minute
Recorded value	Average value of incoming sample data at 1 sample/sec
Initial Warm up Period	1 minutes
PC Software	Windows 7, 8, 10
Maximum data file	20,000 sets of data per file
Send data to Cloud	First 16 sets of data points
Email Saved data file	20,000 sets of data per email
Serial Communication	19,200 BPS, 8-bit, 1 Stop bit, No Parity
Power	USB 2.0
Export Classification	EAR99

6- Troubleshooting

Here is a list of items you need to be aware of if you get into problems:

- During the software installation, the Windows operating system may indicate "Unknown Publisher" or un-trustworthy source, please ignore and install the software. Our software has a Digital Signature and comes from a trusted source.

- Make sure the PC does not go to sleep mode, otherwise you will lose USB communication to the board.

- Make sure your PC is connected to the internet if you are planning to use features like sending emails or data to the cloud.

- Check your antivirus program for any blocking of the application to the internet.

- Check your wireless router for any blocking of the application to the internet.

Yahoo and Gmail accounts have additional security features that does not allow a third party app (Like our app) access the account. In order to access the account from our app, additional steps need to be taken as follows:

Yahoo Accounts:

You need to login to your Yahoo account and under Account Security add our app (LFSDAQ) and generate a Password. Then use that Password in our app for the account Password in the settings menu. Leave Port number as 25.

Gmail Accounts:

Sign into your Google account. Under Security, there is a section called "Less secure app access". You need to turn this ON. This allows you to access your Gmail account from our app. Leave Port number as 25.

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