In-Class Activity

Taum Sauk – Alarm System

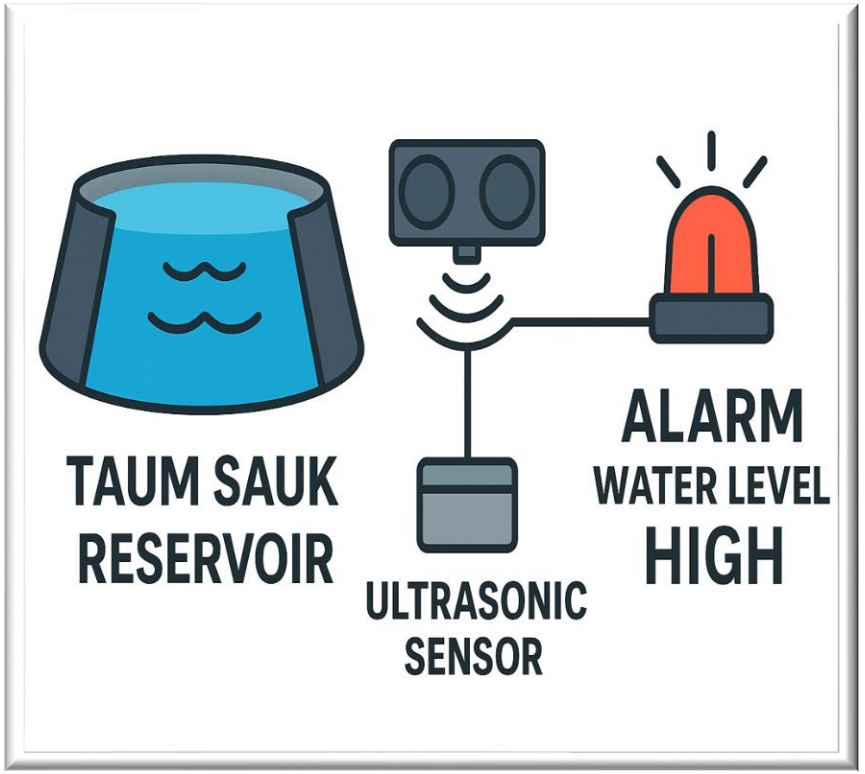
PURDUE UNIVERSITY | School of Engineering Education

ICA – Taum Sauk Alarm System

Develop an alarm system that could have prevented the **Taum Sauk Reservoir** accident by detecting very high water levels.

Instructions:

- Use an **ultrasonic sensor** and a **buzzer**.
- Use **Data Streamer** to see the data in **real time**.
- Your code will be **AI-assisted**.
- Send **three values** to the Serial Monitor:
  - **Time**: shows the timestamp of the reading.
  - CH1: shows "**ALERT: Water level critical!**" when the distance is less than 5 cm.
  - CH2: shows the **distance in cm** (simulating the water level).
- The **buzzer must turn on** when the water is too high.

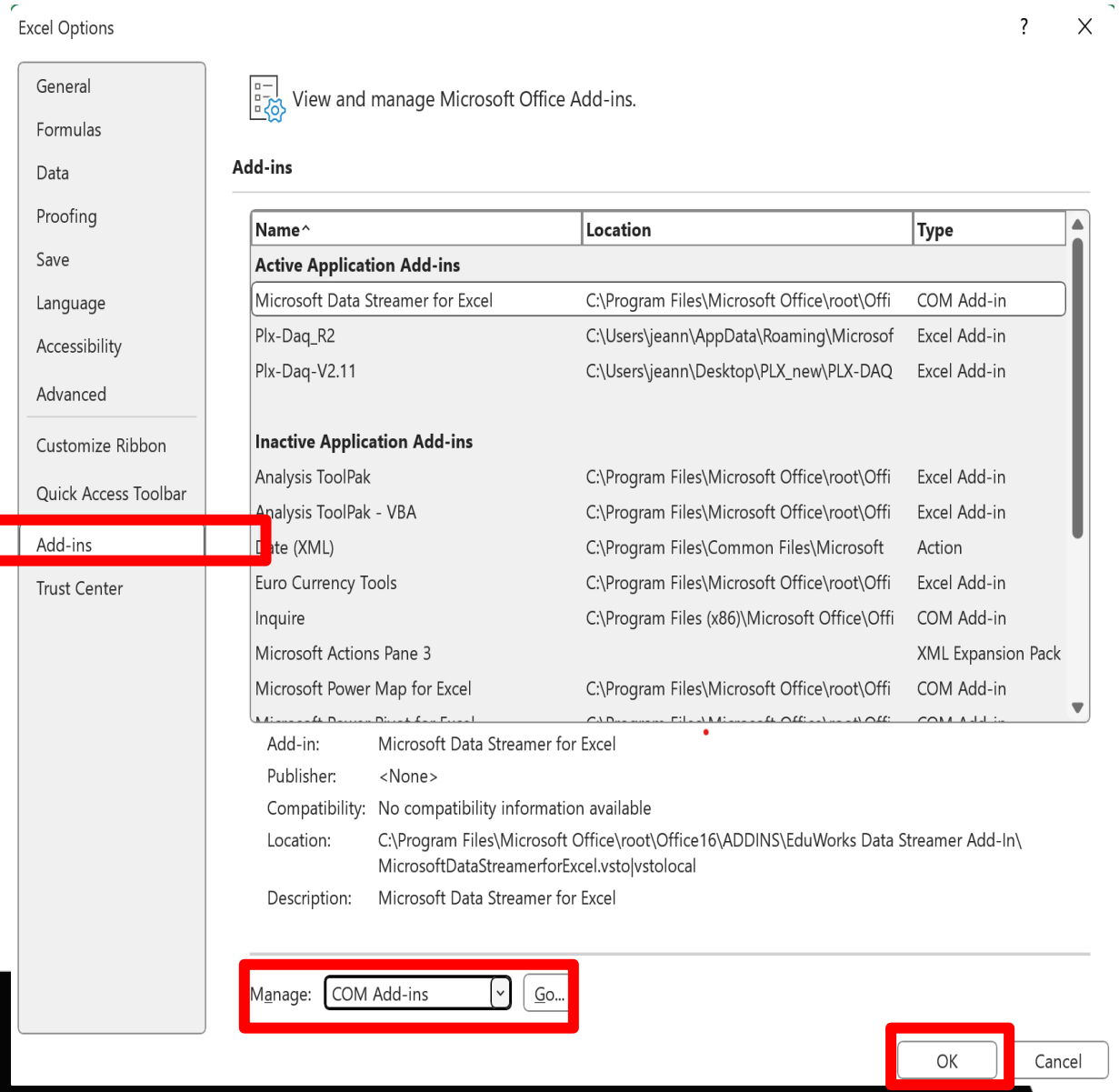


Data Streamer in Excel

Microsoft Data Streamer is a tool used to send and receive information via the serial port.

How to Install Data Streamer?

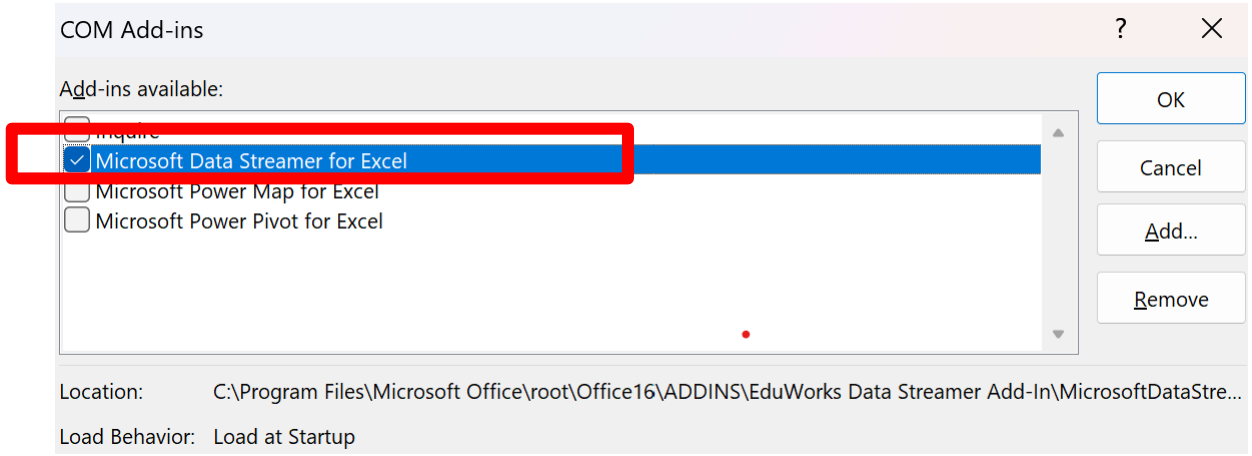
1. Open Microsoft Excel.
2. Go to File > Options > Add-ins.
3. In the "Manage" dropdown menu, select COM Add-ins and click Go.



Data Streamer in Excel

4. In the window that appears, search for and select Microsoft Data Streamer for Excel.

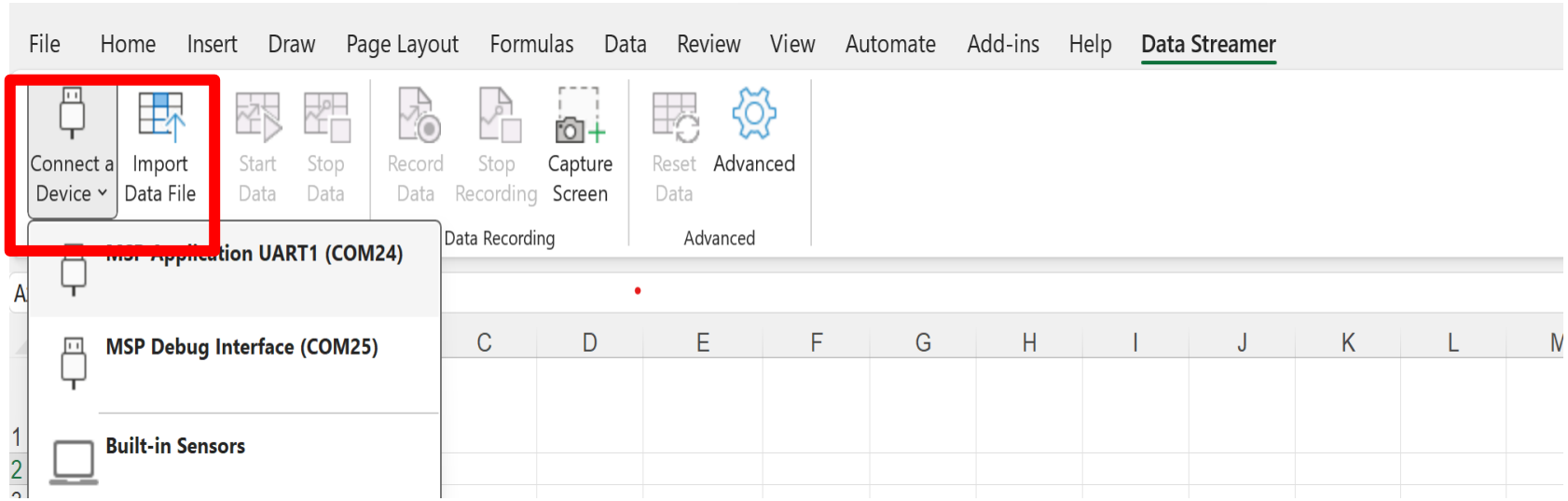
5. Click OK to install the add-in.



Getting Started with Data Streamer

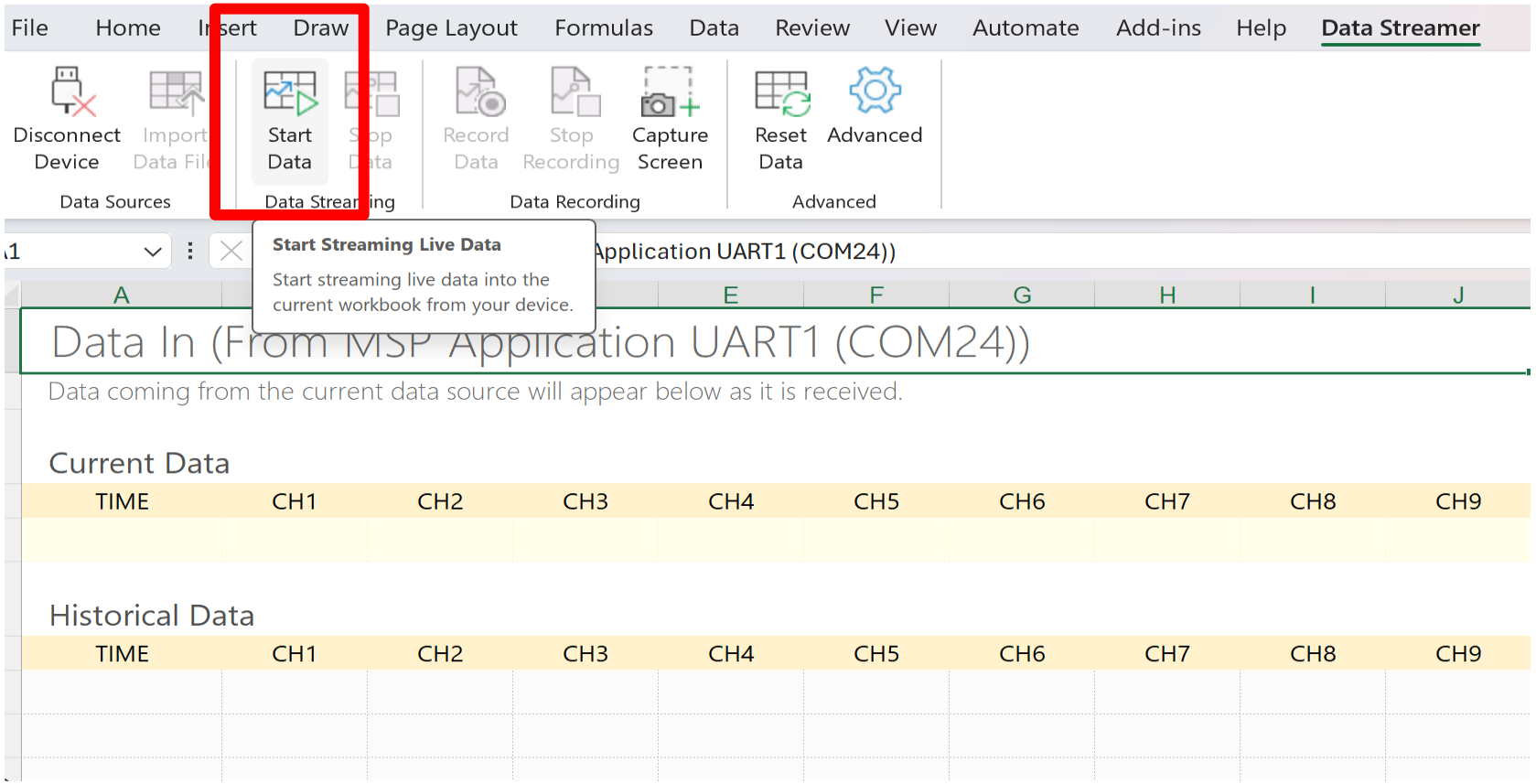
Once installed, Microsoft Data Streamer will be available in the "Data Streamer" tab in Excel. From here, you can start setting up your project to capture real-time data.

Select Data Streamer, then choose 'Connect a Device' and select the serial port used for data transmission.



Data Streamer – Start Data

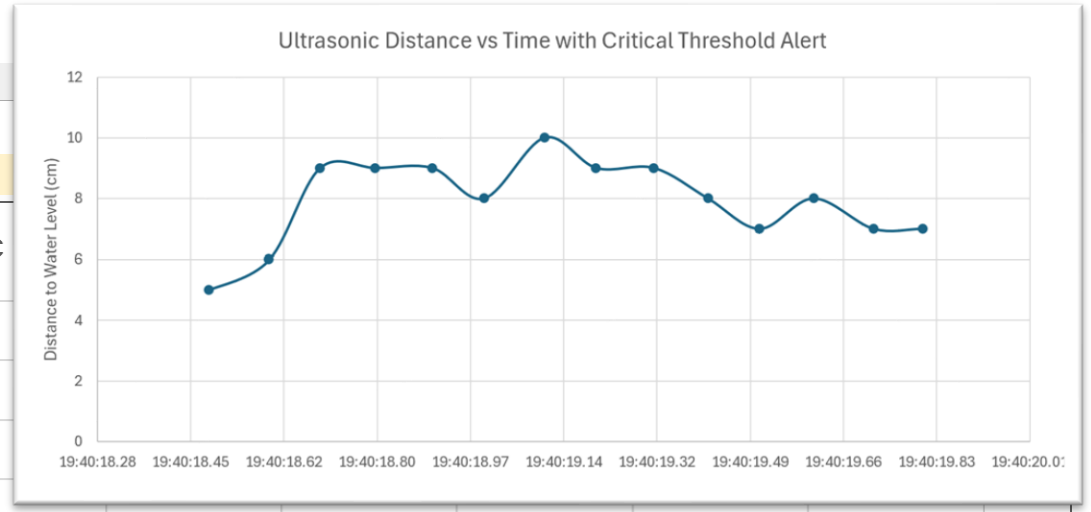
You should view this image, then select 'Start Data' to begin seeing your readings.



Displaying Readings with the Appropriate Chart

Select the appropriate chart for your readings.

	A	B	C	D	E	F	G
6	Historical Data						
7	TIME	CH1	CH2	CH3	CH4	CH5	CH6
8	19:38:53.94	338.84	8				
9	19:38:54.03	338.94	7				
10	19:38:54.13	339.04	5				
11	19:38:54.24	339.14	-1				
12	19:38:54.27	ALERT: Water level critical!					
13	19:38:54.34	339.25	-1				
14	19:38:54.37	ALERT: Water level critical!					
15	19:38:54.45	339.35	-1				
16	19:38:54.46	ALERT: Water level critical!					
17	19:38:54.55	339.45	-1				
18	19:38:54.57	ALERT: Water level critical!					
19	19:38:54.64	339.55	-1				
20	19:38:54.68	ALERT: Water level critical!					
21	19:38:54.75	339.65	-1				
	19:38:54.78	ALERT: Water level critical!					



You can program a -1 in CH2 when the water level is too high.

Submission Instructions – Taum Sauk Alarm System

Submit a Word document (.docx) to the submission link (ICA Class 3B-Alarm system) that includes the following:

- **Screenshots** of the **Data Streamer** window:
  – Show the columns Time, CH1, and CH2.
  – Include at least one screenshot showing the alert message (CH1) and a -1 in CH2.

- **A chart** created in Excel using the data from Data Streamer:
  – X-axis: Time (in seconds)
  – Y-axis: Distance in cm (CH2)
  – Use a descriptive title

- Confirm that the **buzzer turned on** when the water level was less than 5 cm.

ENGR 131

Studio Time

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BEFORE YOU LEAVE . . .