

**\*Before you go, please make sure you have the updated OS version for wifi shield (higher than v1.22)**

ArcGIS Online (<https://www.arcgis.com/>) is an online, collaborative web GIS that allows you to use, create, and share maps data for analytics and visualization. One of the very interesting features of ArcGIS is the ability to collecting live sensor data via its RESTful API and publish data as a visual web layer. Below are the 7 steps needed to add new or update data from Muselab Wifi shield to the ArcGIS system. It is also good to know that there are free trial accounts for anyone. ArcGIS does provide free non-commercial license and discount for schools and developers thereafter. Please contact a local Esri representative for further detail.

Step 1. Sign up the ArcGIS online services. Go to [developer.arcgis.com](https://developer.arcgis.com) and log in with your ArcGIS Online account.

Step 2. Create the layer for the Arcgis map. There should be 3 fields\*.

- sensor\_id
- sensor\_type
- sensor\_reading

Field Name	Field Alias	Field Type	Domain	Required	
sensor_id	sensor_id	String	+	<input type="checkbox"/>	
sensor_type	sensor_type	String	+	<input type="checkbox"/>	
sensor_reading	sensor_reading	Double	+	<input type="checkbox"/>	

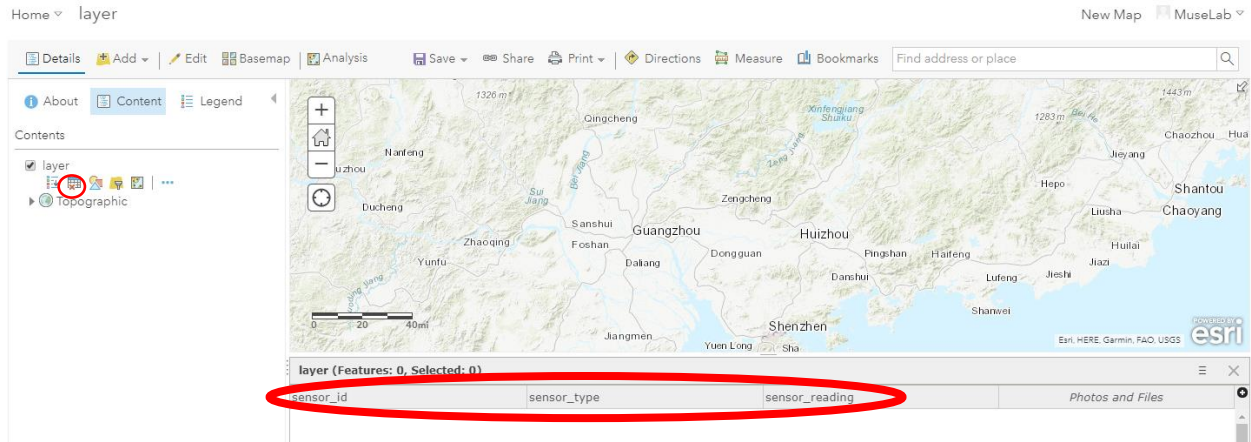
\* Be aware that these 3 fields are case-sensitive (capital letter or small letter must be the same).

\*\*Detail for create the account, please go to this link. XXXXXX

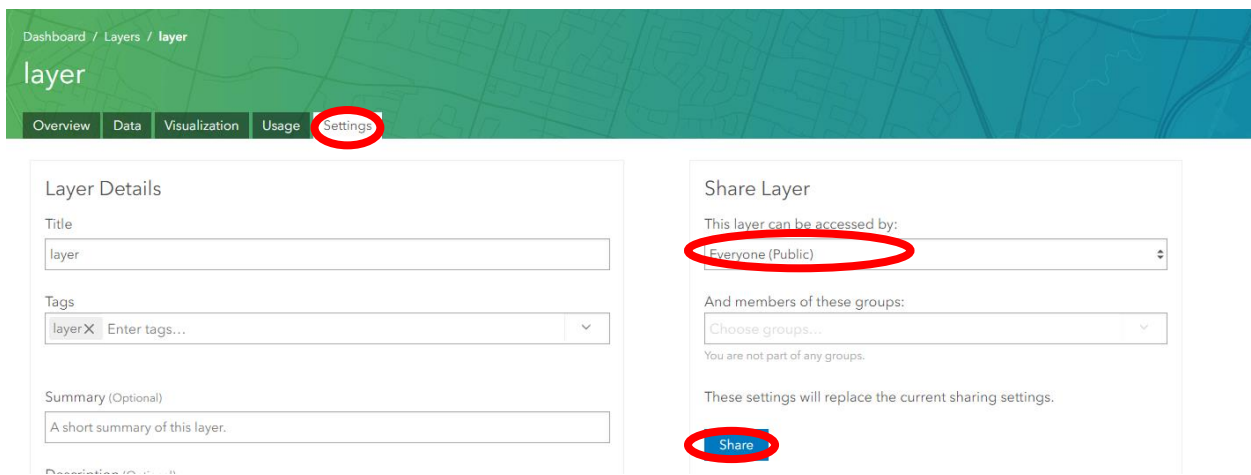
Step 3. By clicking (Overview -> Open in Map Viewer), you will get the map that contains a table which have these 3 fields (sensor\_id, sensor\_type, sensor\_reading).

The screenshot shows the ArcGIS Online interface for a layer named 'layer'. The 'Overview' tab is selected in the top navigation bar. Below the navigation bar, there is a summary section with the following information: Summary: No summary. Created: Wednesday Apr 25 2018, 1:25PM. Modified: Wednesday Apr 25 2018, 1:25PM. Tags: layer. On the right side, there is a 'Share' button and two options: 'Open in Map Viewer' (highlighted with a red circle) and 'Open in Scene Viewer'.

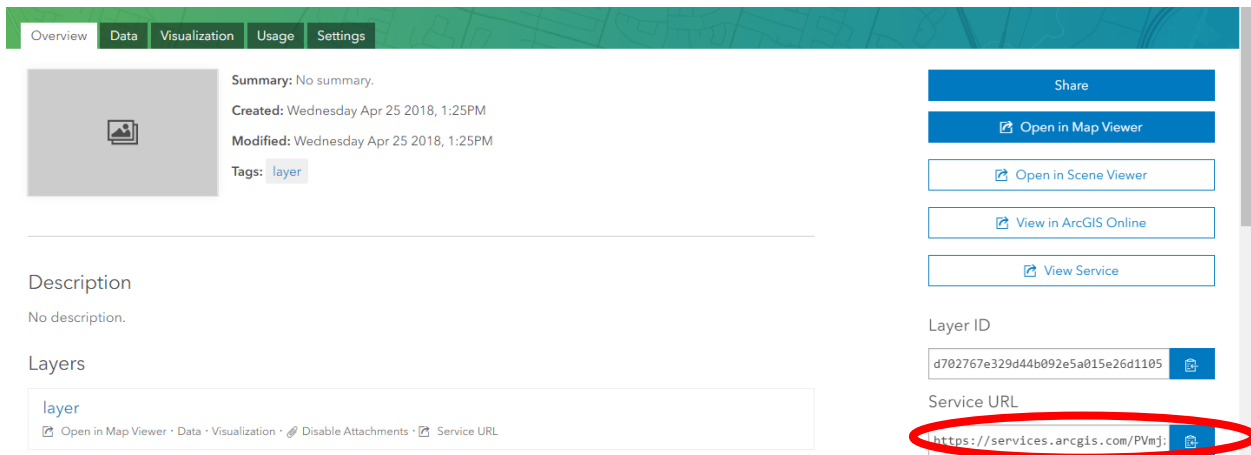




Step 4. Make sure your created layer is open to public. (Settings -> Share Layer -> Everyone)



Step 5. Go to the Overview tab, copy the Service URL.



Step 6. Go back to block editor, firstly, you have to set up your network connection on the MuseLab WiFi IoT Robotic Shield. If you have already done so, please continue with “Step 2”, otherwise click below link and follow the instructions.

```
on start
  Initialize WiFi IoT Shield and OLED
  pause (ms) 5000
  Set wifi to ssid "muselab" pwd "12345678"
```

Step 7. For this function, we try to add the data to the map first. Take the URL you have just copied.

<https://services.arcgis.com/PVmjzzOU2FGQqnst/arcgis/rest/services/layer/FeatureServer>

Server name      Service ID      Layer name

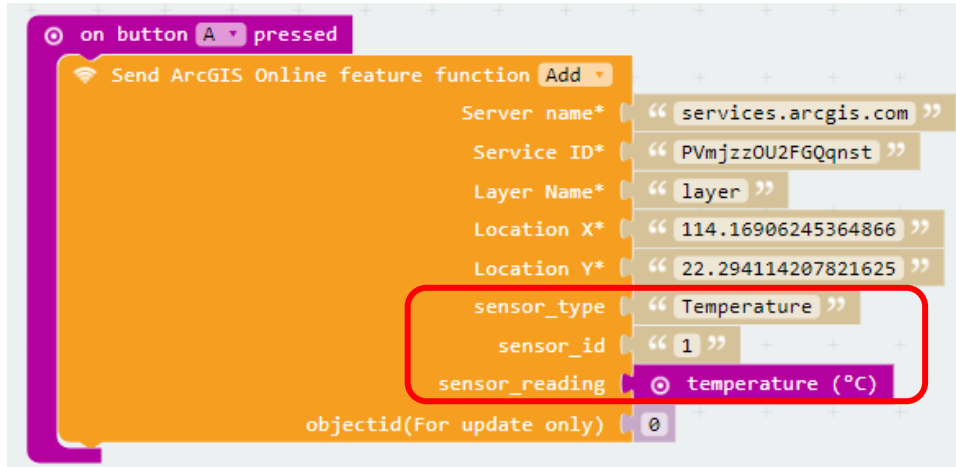
```
on button A pressed
  Send ArcGIS Online feature function Add
    Server name* "services.arcgis.com"
    Service ID* "PvmjzzOU2FGQqnst"
    Layer Name* "layer"
    Location X* ""
    Location Y* ""
    sensor_type " "
    sensor_id " "
    sensor_reading 0
    objectid(For update only) 0
```

Step 8. Find your location x-coordinate and y-coordinate. For this example, it is the location for “Tsim Sha Tsui STAR FERRY” in Hong Kong.

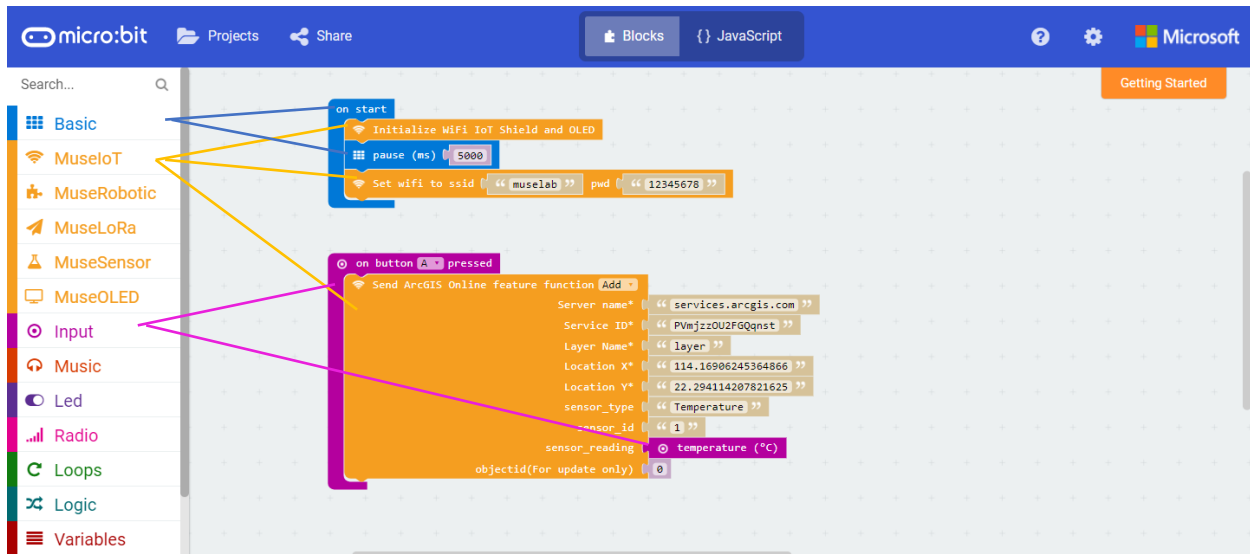
```
on button A pressed
  Send ArcGIS Online feature function Add
    Server name* "services.arcgis.com"
    Service ID* "PvmjzzOU2FGQqnst"
    Layer Name* "layer"
    Location X* "114.16906245364866"
    Location Y* "22.294114207821625"
    sensor_type " "
    sensor_id " "
    sensor_reading 0
    objectid(For update only) 0
```

Step 9. Input the data you want to upload. For this example, we upload the temperature.

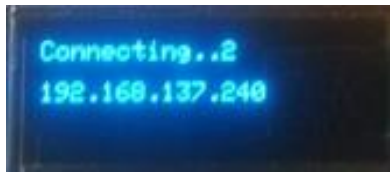
- sensor\_type: Temperature (It is your sensor type, you can define your sensor type)
- sensor\_id: 1 (it is sensor id, here we just define it is 1)
- Sensor\_reading: microbit temperature



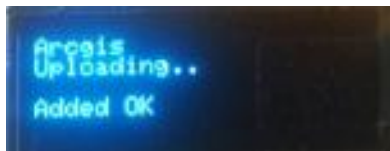
The full initialize script would be as follow



After the shield has been connected to the Internet.



Press the button A on the microbit. You will get the below message on the screen.



Go to the map viewer and check, you got the data uploaded!

A screenshot of an ArcGIS Online map viewer. The map shows the Kowloon Peninsula in Hong Kong, with several subway stations marked with red 'X' icons. A red arrow points to a blue circular data point located at the Tsim Sha Tsui East Station. Below the map, a table displays the data for this point. The table has four columns: 'sensor\_id', 'sensor\_type', 'sensor\_reading', and 'Photos and Files'. The first row contains the values '1', 'Temperature', '29.00', and '(0) Add'. This row is circled in red.

sensor_id	sensor_type	sensor_reading	Photos and Files
1	Temperature	29.00	(0) Add

If you press one more time button, it will be uploaded one more time!

A screenshot of an ArcGIS Online map viewer, similar to the previous one. The map shows the same area. Below the map, a table displays two data points. The first row is identical to the previous screenshot: '1', 'Temperature', '29.00', '(0) Add'. The second row contains the values '1', 'Temperature', '31.00', '(0) Add'. Two red arrows point to the first column of the second row, indicating the addition of a new data point.

sensor_id	sensor_type	sensor_reading	Photos and Files
1	Temperature	29.00	(0) Add
1	Temperature	31.00	(0) Add

Done! Please enjoy your digital geographic adventure!

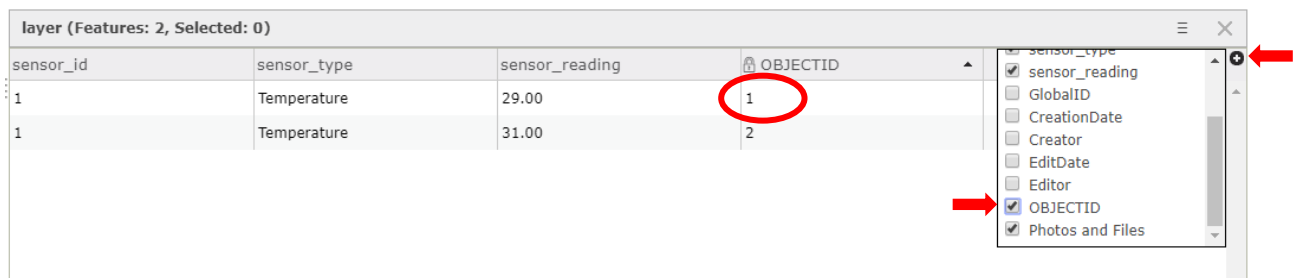
## UPDATE FEATURE

If you want to update the data you have uploaded before, it is also possible! For example, you want to update the **first data** to another location, with different sensor\_id.

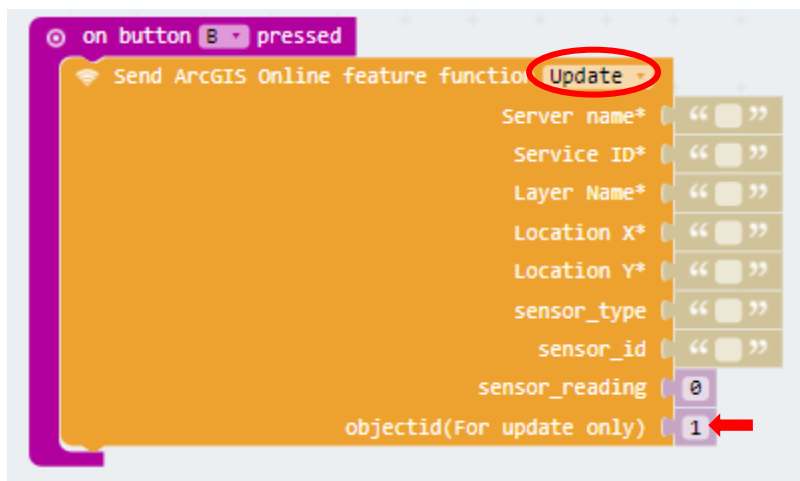
	From	To
sensor_id	1	2
Location X,Y	"Tsim Sha Tsui STAR FERRY" (114.16906245364866,22.294114207821625)	"PRINCE EDWARD RAILWAY STATION" (114.16986641456171,22.32415906970101)

Before you do that, you need to know the "OBJECTID" of the row data that you are going to update.

STEP1: Click the "+" button and tick the "OBJECTID". You can find the "OBJECTID" for the first data.

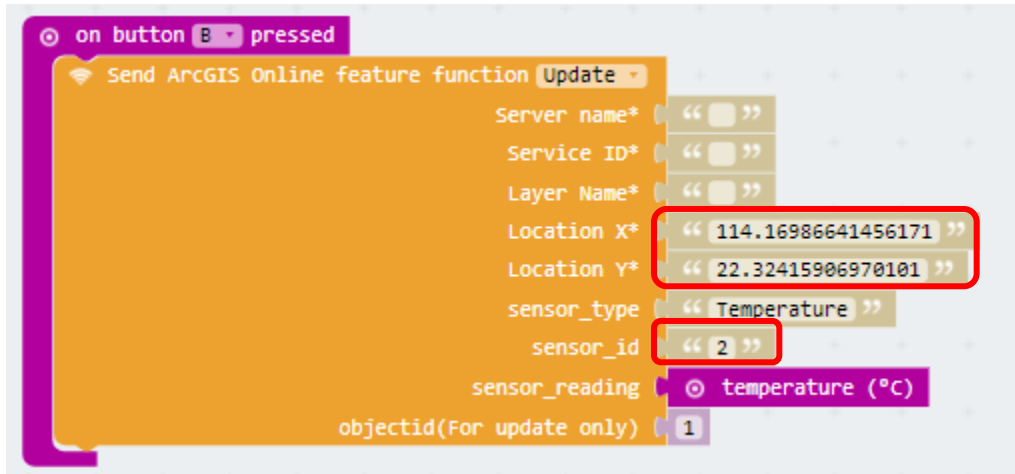


STEP2: for this example, we change the first data (OBJECTID = 1) and choose Update.



STEP3: Input the new information you just want to update. For sensor\_type and sensor\_reading, they are still the same.

	From	To
sensor_id	1	2
Location X,Y	"Tsim Sha Tsui STAR FERRY" (114.16906245364866,22.294114207821625)	"PRINCE EDWARD RAILWAY STATION" (114.16986641456171,22.32415906970101)



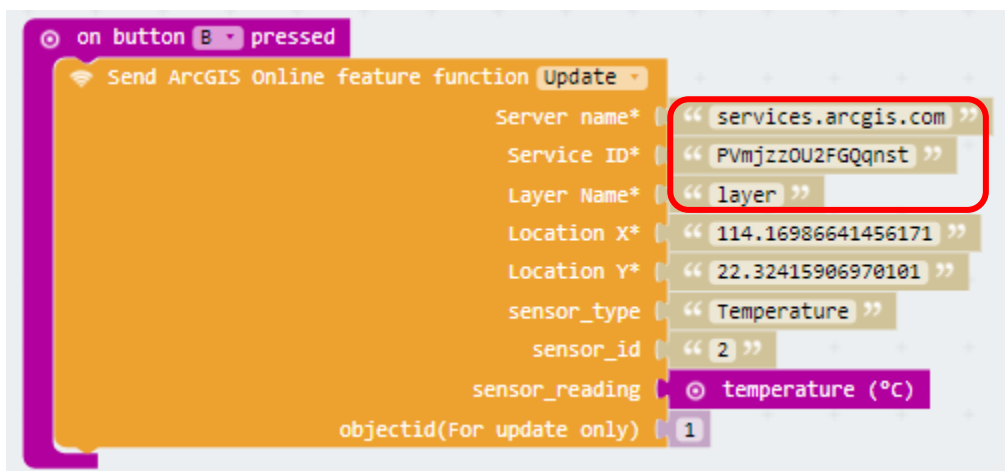
STEP4: Put the required basic information.

<https://services.arcgis.com/PVmjzzOU2FGQqnst/arcgis/rest/services/layer/FeatureServer>

Server name

Service ID

Layer name

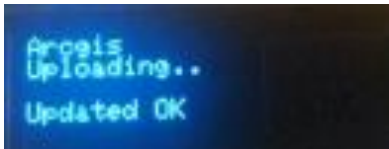




After the shield has been connected to the Internet.



Press the button A on the microbit. You will get the below message on the screen.



Go to the map viewer and check, you got the data updated! Location and sensor\_id are also updated.

layer (Features: 2, Selected: 1)			
sensor_id	sensor_type	sensor_reading	Photos and Files
2	Temperature	29.00	(0) Add
1	Temperature	31.00	(0) Add

For more information, you can tick "CreationDate" and "EditDate". Then, you can see the "EditDate" is just few minutes ago!

layer (Features: 2, Selected: 1)					
sensor_id	sensor_type	sensor_reading	CreationDate	EditDate	
2	Temperature	29.00	4/25/2018, 4:13 PM	4/25/2018, 5:00 PM	<input checked="" type="checkbox"/> sensor_id
1	Temperature	31.00	4/25/2018, 4:26 PM	4/25/2018, 4:26 PM	<input checked="" type="checkbox"/> sensor_type

- sensor\_reading
- GlobalID
- CreationDate
- Creator
- EditDate
- Editor
- OBJECTID
- Photos and Files