



Machine Learning for Advanced Process Control Lab- Cyber Physical System Enabled
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Digital Twins work credits to: Mr. Aromal V. K, B. Tech (CPS), MIT, Manipal
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User Manual: Using the DigitalTwinsClientWrapper Class

Overview

This guide explains how to use the `DigitalTwinsClientWrapper` class to interact with Azure Digital Twins. You'll learn how to install dependencies, import the class, and send/receive data from five specific digital twins.

Prerequisites

- Python 3.7 or higher
- Access to Azure Digital Twins instance
- Basic knowledge of Python

Step 1: Install Required Packages

Open a terminal and run the following command:

```
pip install azure-identity azure-digitaltwins-core
```

Step 2: Import the Class

The class is saved in a Python file named `azclient.py`, import it in your main script:

```
from azclient import DigitalTwinsClientWrapper
```



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NOTE: Keep the `azclient.py` file in the same folder as your code.

Step 3: Initialize the Client

Keep these line of code right after the imports

```
adt_url = "https://RLDT2.api.sea.digitaltwins.azure.net"  
dt = DigitalTwinsClientWrapper(adt_url)
```

After running your code, you will be prompted to open a browser and enter a device code to authenticate. Share this code with admin. This will be required every time the code ends.

Step 4: Digital Twin IDs and Properties

Here are the five digital twins you will interact with:

Twin ID	Property Key	Description
ReactorTemp	temp	Temperature of the reactor
JacketTemp	temp	Temperature of the jacket
CoolantTemp	temp	Temperature of the coolant
Heater	sigVal	Heater control signal



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Coolant

sigVal

Coolant control
signal

Step 5: Receiving Data (Read Values)

Use `get_data(twin_id, property_key)` to retrieve a value.

Example:

```
Tr = dt.get_data("ReactorTemp", "temp")
```

```
Tj = dt.get_data("JacketTemp", "temp")
```

```
Tc = dt.get_data("CoolantTemp", "temp")
```

```
Op1 = dt.get_data("Heater", "sigVal")
```

```
Op0 = dt.get_data("Coolant", "sigVal")
```

Step 6: Sending Data (Update Values)

Use `send_data(twin_id, property_path, value)` to update a twin property.

Example:

```
dt.send_data("Coolant", "/sigVal", 55.0)
```

```
dt.send_data("Heater", "/sigVal", 70.0)
```

Note: Property paths must include a slash (e.g., `/sigVal` or `/temp`).

Summary

You can now:



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- Read temperatures from **ReactorTemp**, **JacketTemp**, and **CoolantTemp**
Send control signals to **Coolant** and **Heater**
- Extend functionality by wrapping this class into larger applications