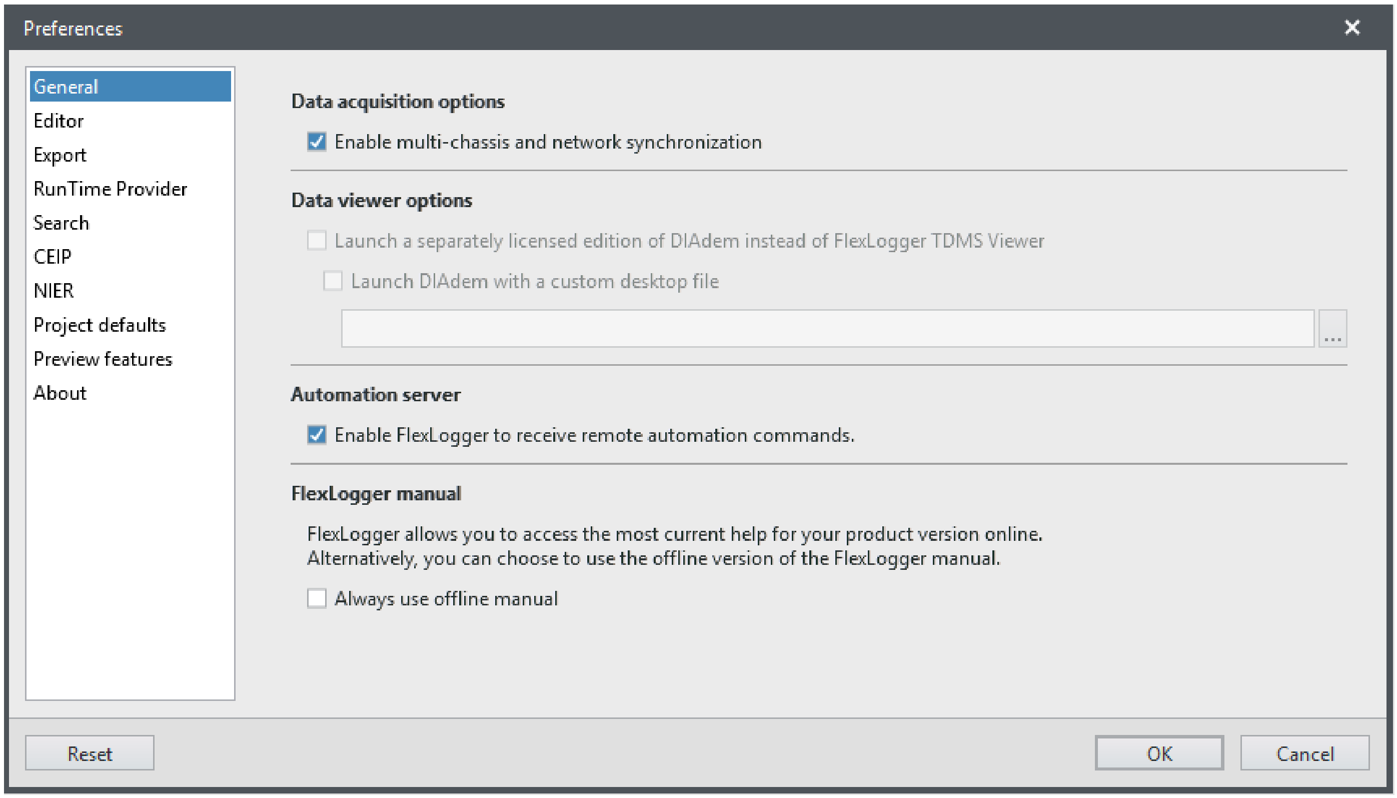
FlexLogger Python Automation Example

With the FlexLogger Automation API, users can control a FlexLogger test session and analyze the resulting data with the same Python program.

Connect to FlexLogger and run a test

This example connects to an already-running FlexLogger project, so the **Automation server** preference must be enabled:



Data acquisition options

[✓] Enable multi-chassis and network synchronization

Data viewer options

[ ] Launch a separately licensed edition of DIAdem instead of FlexLogger TDMS Viewer

[ ] Launch DIAdem with a custom desktop file

Automation server

[✓] Enable FlexLogger to receive remote automation commands.

FlexLogger manual

FlexLogger allows you to access the most current help for your product version online. Alternatively, you can choose to use the offline version of the FlexLogger manual.

[ ] Always use offline manual

In [7]:

```
import time
from flexlogger.automation import Application

flexlogger_app = Application()
project = flexlogger_app.get_active_project()
if project is None:
        print("No project is open in FlexLogger!")
test_session = project.test_session
test_session.start()
time.sleep(30)  # time for operator to manipulate the DUT
test_session.stop()
flexlogger_app.disconnect()
```

Read the resulting TDMS data file

There are several TDMS packages available on the Python Package Index (PyPI). This example uses npTDMS (docs) to access the test data as NumPy arrays.

In [1]:

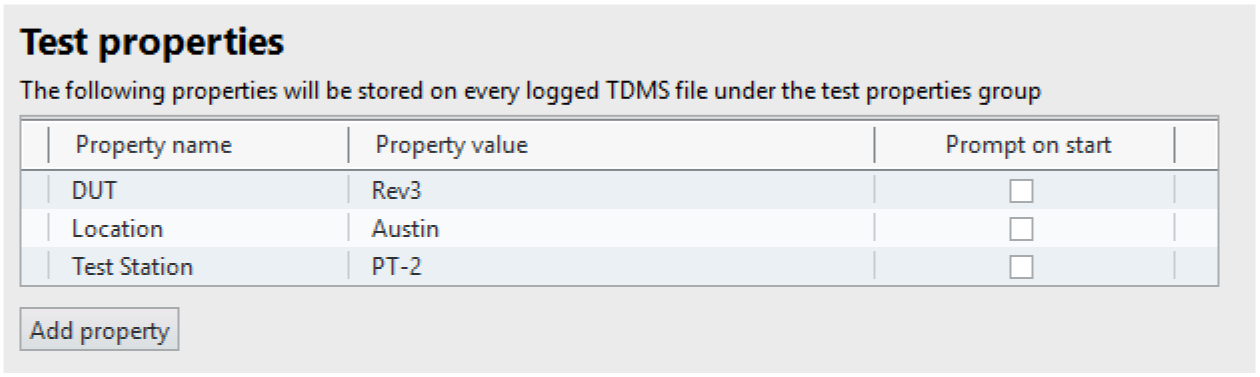
```
import nptdms
import os
import pathlib
```

```
data_directory = pathlib.Path(os.getcwd()) / "FlexLogger-Project" / "data"
data_files = data_directory.glob("*")
latest_file_path = max(data_files, key=lambda p: p.stat().st_ctime)
if latest_file_path.suffix == ".tdms_index":
    latest_file_path = latest_file_path.with_suffix(".tdms")
print("Analyzing new TDMS file: {}".format(latest_file_path))
tdms_file = nptdms.TdmsFile.read(latest_file_path)
```

```
Analyzing new TDMS file: c:\sandbox\flexlogger-automation-example\FlexLogger-Project\data\LogFile_
2021-02-23-09-45-28.tdms
```

Review the project's Test properties

FlexLogger allows users to log custom test properties to supplement the measurement data. The example project has three different properties:



Test properties

The following properties will be stored on every logged TDMS file under the test properties group

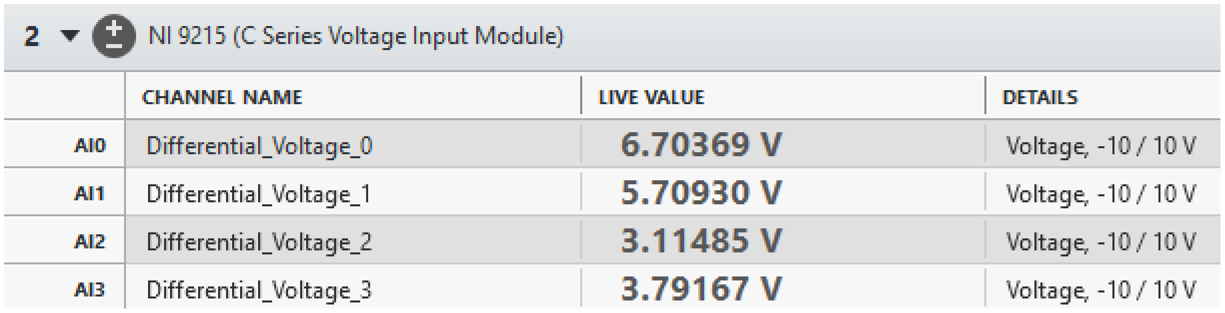
Property name	Property value	Prompt on start
DUT	Rev3	☐
Location	Austin	☐
Test Station	PT-2	☐

In [2]:
```
test_information = tdms_file["Test Information"]
test_DUT = test_information.properties["Test_properties~DUT"]
test_Location = test_information.properties["Test_properties~Location"]
test_Station = test_information.properties["Test_properties~Test Station"]
print(
    "DUT: {} ; Location: {} ; Test station: {}".format(
        test_DUT, test_Location, test_Station
    )
)
```

```
DUT: Rev3 ; Location: Austin ; Test station: PT-2
```

Were the measurements within the expected bounds?

This example uses a FlexLogger project with a configured NI-9215 input module:



2 NI 9215 (C Series Voltage Input Module)

	CHANNEL NAME	LIVE VALUE	DETAILS
AI0	Differential_Voltage_0	6.70369 V	Voltage, -10 / 10 V
AI1	Differential_Voltage_1	5.70930 V	Voltage, -10 / 10 V
AI2	Differential_Voltage_2	3.11485 V	Voltage, -10 / 10 V
AI3	Differential_Voltage_3	3.79167 V	Voltage, -10 / 10 V

Check the bounds using NumPy's min and max methods.

In [3]:
```
channels = tdms_file["Log"].channels()
voltage_max = 7
```

```
voltage_min = 1
for channel in channels:
    channel_max = channel.data.max()
    channel_min = channel.data.min()
    within_bounds = (voltage_max > channel_max) and (channel_min > voltage_min)
    if within_bounds:
        print(
            "{} stayed within the expected voltage range".format(
                channel.name
            )
        )
    else:
         print(
             "{} went OUTSIDE the expected voltage range".format(
                 channel.name
             )
         )
```

```
Differential_Voltage_0 went OUTSIDE the expected voltage range
Differential_Voltage_1 stayed within the expected voltage range
Differential_Voltage_2 stayed within the expected voltage range
Differential_Voltage_3 stayed within the expected voltage range
```

Visualize the measurements

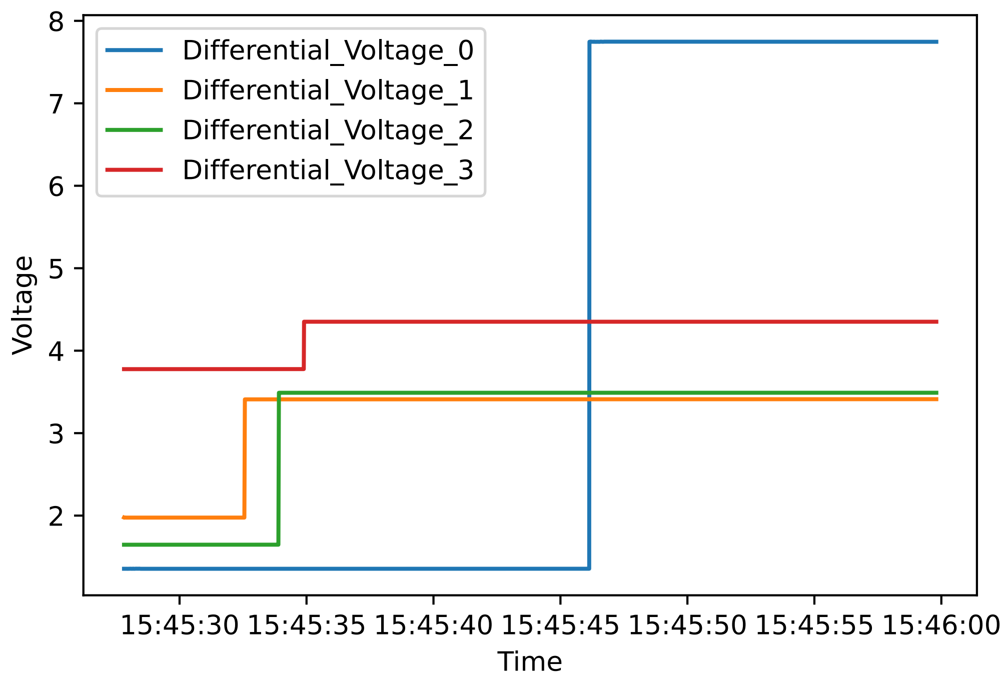
Plot the measurement data with Matplotlib - the most popular Python visualization library.

In [4]:

```
import matplotlib.pyplot as plt

channel_time = channels[0].time_track(absolute_time=True)
fig, ax = plt.subplots()
ax.set(
     xlabel="Time", ylabel="Voltage"
)  # channels from the same DAQ sample group share timing information

for channel in channels:
    ax.plot(channel_time, channel.data, label=channel.name)
ax.legend()
plt.show()
```


Differential_Voltage_0
Differential_Voltage_1
Differential_Voltage_2
Differential_Voltage_3
Voltage
Time
15:45:30 15:45:35 15:45:40 15:45:45 15:45:50 15:45:55 15:46:00