NI Measurement Plug-In Converter

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# Overview

NI Measurement Plug-In Converter converts Python measurements to measurement plug-ins.

# Related Links

* [Measurement Plug-In Overview - NI](https://www.ni.com/docs/en-US/bundle/measurementplugins/page/measurement-plugins.html)
* [TestStand Manual](https://www.ni.com/docs/en-US/bundle/teststand/page/user-manual-welcome.html)

# Software Requirements

[Python 3.8.5](https://www.python.org/downloads/release/python-385/)

|  |  |
| --- | --- |
| **Python Packages** | **Version Required** |
| Mako | 1.2.1 or above |
| click | 8.1.3 or above |
| astor | 0.8.1 or above |
| pydantic | 2.8.2 or above |
| ni-measurement-ui-creator | 1.0.0.dev7 or above |
| black | 24.8.0 or above |

|  |  |
| --- | --- |
| NI Packages | Version Required |
| NI InstrumentStudio Pro | 2024 Q3 or above (Optional) |
| NI TestStand | 2023 Q4 or above (Optional) |

# Installation

* Run the `install.bat` file by double clicking it.

## Note:

* Require Internet access to install the external dependencies of NI Measurement Plug-In Converter.

# Supported Datatypes

* int
* float
* str
* bool
* List[int]
* List[float]
* List[str]
* List[bool]

# Supported Instrument Drivers

* NI-DCPower
* NI-DMM
* NI-Digital
* NI-FGEN
* NI-Scope
* NI-Switch
* VISA

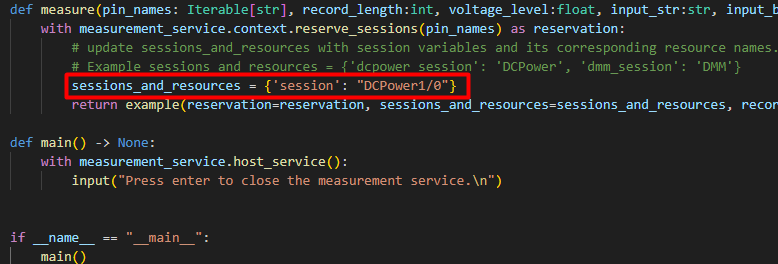
# Prerequisites

The Python measurement should

* Contain a measurement function which should
  + Contain a return value. The return value should be a variable and not a direct function call or constant value.
  + Have properly type hinted inputs and outputs.
  + Use one of the supported drivers.
* Initialize the instrument driver's session inside the measurement function and within the next level of indentation.
* All the driver’s session must be initialized at a single point using context manager `with` in Python.

# Post Conversion Steps

For all the instrument drivers, the sessions\_and\_resources must be updated with the session variables and resource names used.



# Limitations

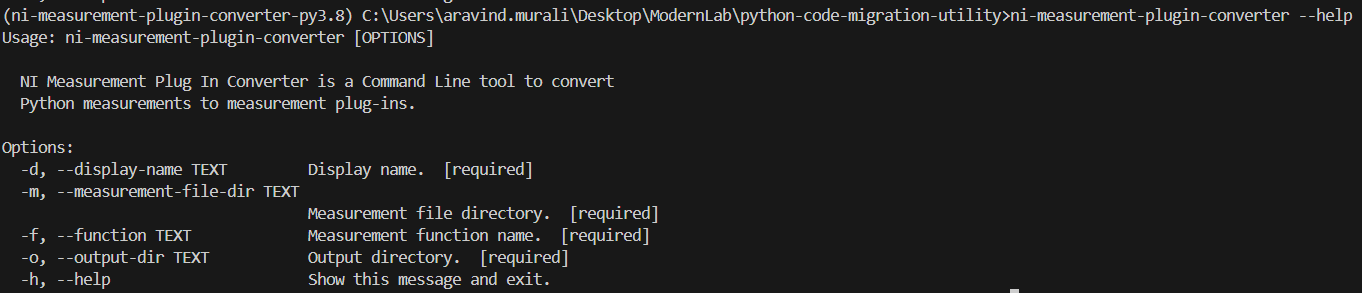
* Conversion of measurement class is not supported.
* Measurement UI created by the tool doesn’t support List of strings and List of booleans.

# Known Issues

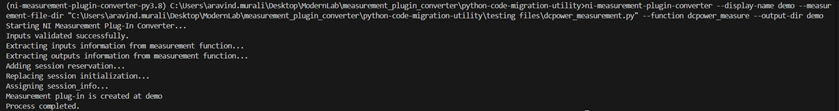
* Measurements which didn’t follow the prerequisites will not be converted correctly.
* For NI-Switch a few more additional steps must be followed. Refer [Additional Steps for NI-Switch](#_Additional_Steps_for_1)
* For NI-VISA a few more additional steps must be followed. Refer [Additional Steps for VISA instruments](#_Additional_Steps_for)

# How to convert measurements using NI Measurement Plug-In Converter?

* Install the NI Measurement Plug-In Converter. Refer [Installation](#_Installation).
* Open Command Prompt.
* Run the below command,
  + ni-measurement-plugin-converter --display-name <Display Name> --measurement-file-dir <Measurement file directory> --function <Measurement function name> --output-dir <Output directory>



* Modify the CLI arguments with appropriate values.
* Measurement plug-in will be created at the Output directory.



# Additional Steps for NI-Switch

For NI-Switch, the following additional steps must be taken.

If the measurement uses **NI-Switch alone,**

* The pin\_names data type must be updated to `StringArray1D` in measurement.py
* Open the `measui` file in Measurement Plug-In Editor
  + Remove the I/O Resource Array.
  + Add a string array. Link it with pin\_names. Enter the relay names in the string array.

A screen shot of a computer screen

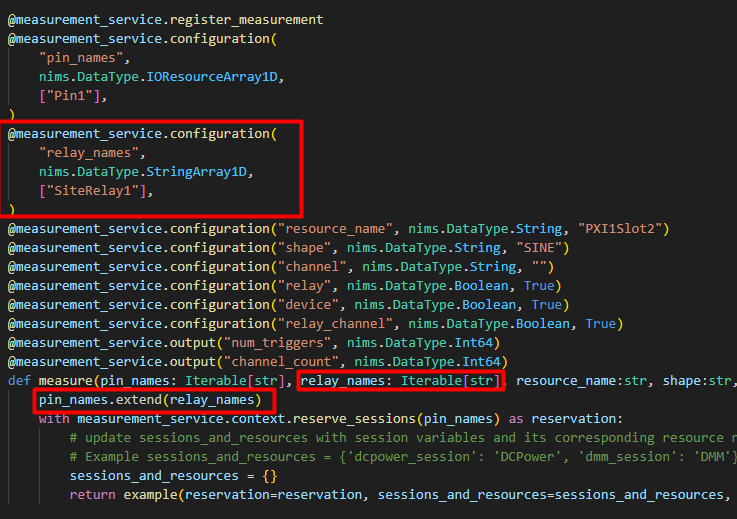
Description automatically generated

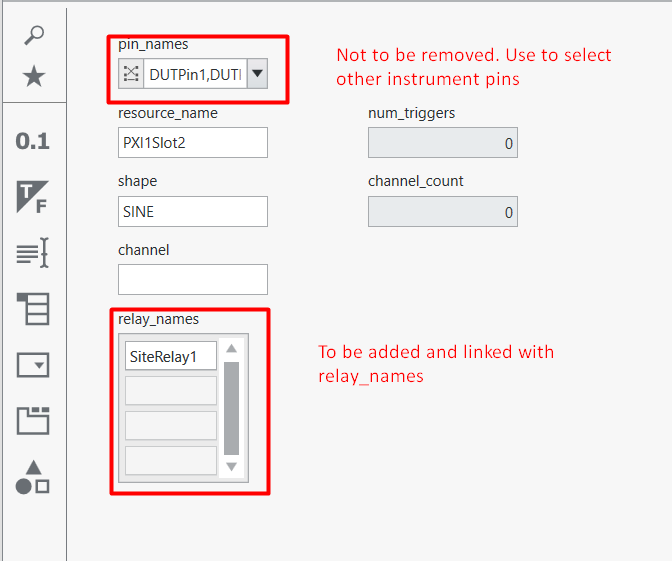
A screenshot of a computer

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If the measurement uses **NI-Switch and other instrument drivers.**

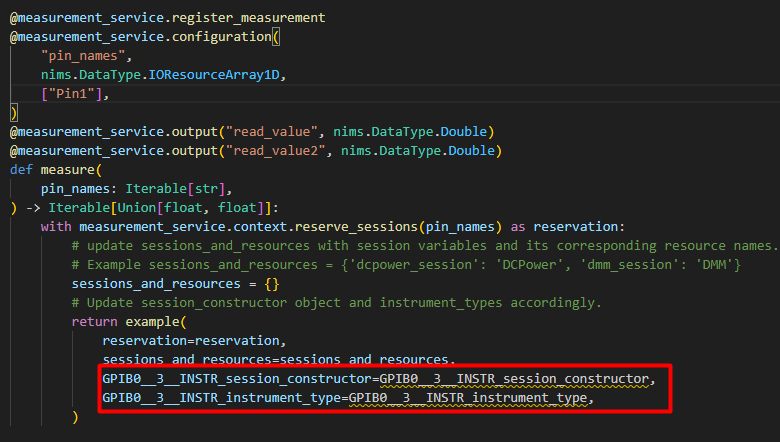
* Add the marked lines of code.
* Open the `measui` file in Measurement Plug-In Editor
  + Add a string array. Link it with relay\_names. Enter the relay names in the string array.
  + Use I/O Resource Array for selecting other instrument’s pins.





# Additional Steps for VISA instruments

For VISA instruments, the session\_constructor and instrument\_types must be updated with appropriate values.



* For session\_constructor, create SessionConstructor object of the instrument driver used.
* For instrument\_types, assign with pin map constant string. This string must be the same defined in pin map.

For example,

* Define the grpc support.
* Define the Session class for the instrument type.
* Define the session constructor the instrument type.
* Update the session constructor object and instrument type.

A computer screen shot of a program

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For details, refer [Example VISA](https://github.com/ni/measurement-plugin-python/tree/releases/2.0/examples/nivisa_dmm_measurement)

A screenshot of a computer program

Description automatically generated

# Event Logger

* The tool will generate a log once the conversion process is started, documenting all the actions performed by the tool throughout the conversion process.
* Log file can be found at the output directory.
* The log includes the details about any errors encountered during the conversion process.