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.dev8 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 Data types & Instrument Drivers

|  |  |
| --- | --- |
| **Data types** | **Instrument Drivers** |
| Int | NI-DCPower |
| Float | NI-DMM |
| Str | NI-Digital |
| Bool | NI-FGEN |
| List[int] | NI-Scope |
| List[float] | NI-Switch |
| List[str]] | NI-DAQmx |
| List[bool] | PyVISA for NI VISA |

* Inputs and output of other data types will be skipped.
* Python measurement must use one of the supported instrument drivers.

# 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.

A screen shot of a computer program

Description automatically generated

* + Have properly type hinted inputs and outputs.

A screen shot of a computer program

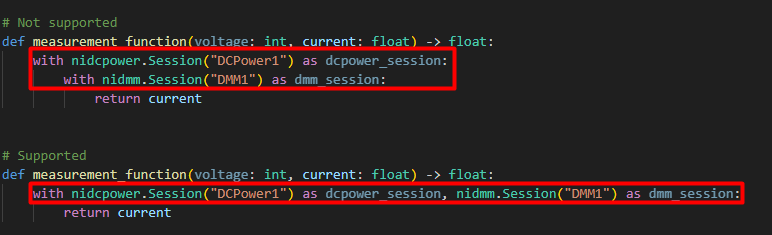
Description automatically generated

* + Use one of the [supported drivers](#_Supported_Data_types). Inputs and Outputs of unsupported data types will be skipped.
* Initialize the instrument driver's session inside the measurement function and within the next level of indentation.

A computer screen shot of text

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* All the driver’s session must be initialized at a single point using context manager `with`.



# Limitations

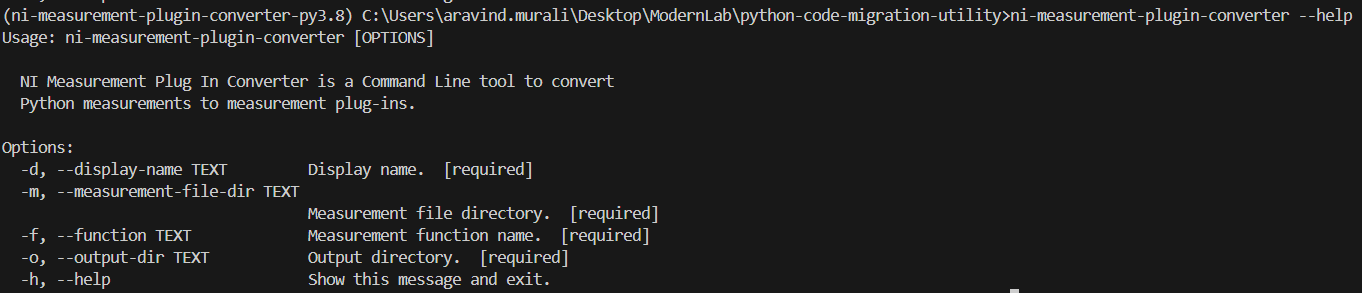
* Conversion of class based measurements are not supported.
* Measurement UI generated by the tool will not include controls and indicators for lists of strings and lists of booleans for their respective inputs and outputs.

# Known Issues

* Measurements which didn’t follow the prerequisites will not be converted correctly.
* For VISA a few more additional steps must be followed. Refer [Additional Steps for VISA instruments](#_Additional_Steps_for_2)

# 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>



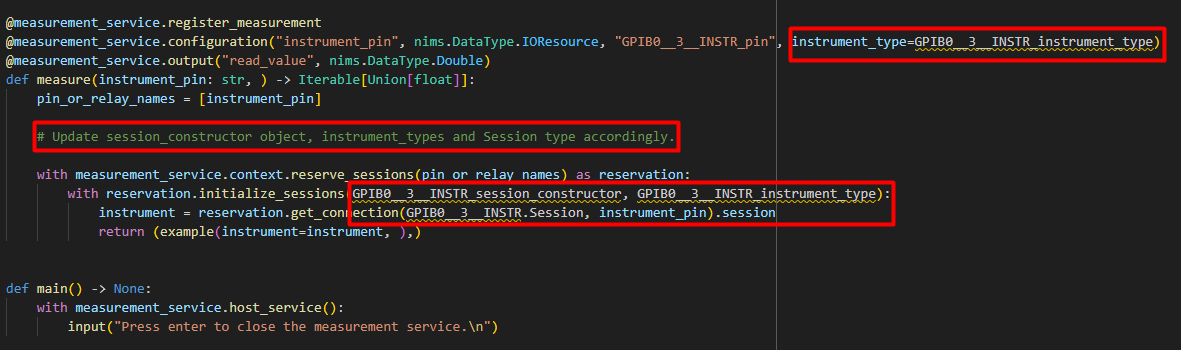
* Modify the CLI arguments with appropriate values.
* Measurement plug-in will be created at the Output directory.

A black screen with white text

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# Additional Steps for VISA instruments

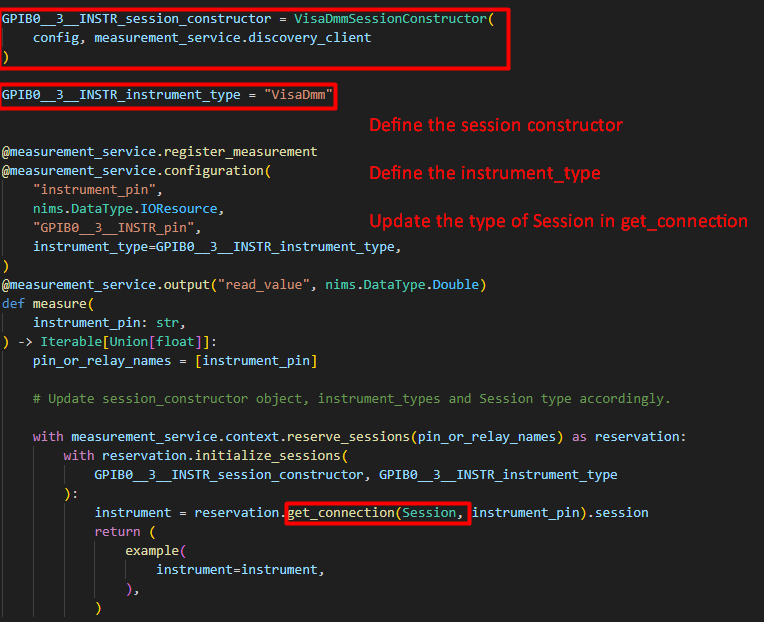
For VISA instruments, the session\_constructor, session type and instrument\_types must be updated with appropriate values.



* 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 session type, the type of session should be passed.

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, instrument type and Session type.



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

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# 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.