
NI-Digital Pattern Driver Python API Documentation

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NI

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DOCUMENTATION

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ABOUT

The **nidigital** module provides a Python API for NI-Digital Pattern Driver. The code is maintained in the Open Source repository for [nimi-python](#).

1.1 Support Policy

nidigital supports all the Operating Systems supported by NI-Digital Pattern Driver.

It follows [Python Software Foundation](#) support policy for different versions of CPython.

CONTRIBUTING

We welcome contributions! You can clone the project repository, build it, and install it by [following these instructions](#).

SUPPORT / FEEDBACK

For support specific to the Python API, follow the processs in [Bugs / Feature Requests](#). For support with hardware, the driver runtime or any other questions not specific to the Python API, please visit [NI Community Forums](#).

BUGS / FEATURE REQUESTS

To report a bug or submit a feature request specific to Python API, please use the [GitHub issues page](#).
Fill in the issue template as completely as possible and we will respond as soon as we can.

4.1 nidigital module

4.1.1 Installation

As a prerequisite to using the **nidigital** module, you must install the NI-Digital Pattern Driver runtime on your system. Visit ni.com/downloads to download the driver runtime for your devices.

The nimi-python modules (i.e. for **NI-Digital Pattern Driver**) can be installed with [pip](#):

```
$ python -m pip install nidigital~=1.4.8
```

4.1.2 Usage

The following is a basic example of using the **nidigital** module to open a session to a digital pattern instrument, source current, and measure both voltage and current using the PPMU on selected channels.

```
import nidigital
import time

with nidigital.Session(resource_name='PXI1Slot2') as session:

    channels = 'PXI1Slot2/0,PXI1Slot2/1'

    # Configure PPMU measurements
    session.channels[channels].ppmu_aperture_time = 0.000004
    session.channels[channels].ppmu_aperture_time_units = nidigital.
↳ PPMUApertureTimeUnits.SECONDS

    session.channels[channels].ppmu_output_function = nidigital.PPMUOutputFunction.
↳ CURRENT

    session.channels[channels].ppmu_current_level_range = 0.000002
    session.channels[channels].ppmu_current_level = 0.000002
    session.channels[channels].ppmu_voltage_limit_high = 3.3
```

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```

session.channels[channels].ppmu_voltage_limit_low = 0

# Sourcing
session.channels[channels].ppmu_source()

# Settling time between sourcing and measuring
time.sleep(0.01)

# Measuring
current_measurements = session.channels[channels].ppmu_measure(nidigital.
↳ PPMUMeasurementType.CURRENT)
voltage_measurements = session.channels[channels].ppmu_measure(nidigital.
↳ PPMUMeasurementType.VOLTAGE)

print('{:<20} {:<10} {:<10}'.format('Channel Name', 'Current', 'Voltage'))
for channel, current, voltage in zip(channels.split(','), current_measurements,
↳ voltage_measurements):
    print('{:<20} {:<10f} {:<10f}'.format(channel, current, voltage))

# Disconnect all channels using programmable onboard switching
session.channels[channels].selected_function = nidigital.SelectedFunction.DISCONNECT

```

Other usage examples can be found on [GitHub](#).

4.1.3 API Reference

Session

class `nidigital.Session`(*self*, *resource_name*, *id_query=False*, *reset_device=False*, *options={}*, *, *grpc_options=None*)

Creates and returns a new session to the specified digital pattern instrument to use in all subsequent method calls. To place the instrument in a known startup state when creating a new session, set the `reset` parameter to `True`, which is equivalent to calling the `nidigital.Session.reset()` method immediately after initializing the session.

Parameters

- **resource_name** (*str*) – The specified resource name shown in Measurement & Automation Explorer (MAX) for a digital pattern instrument, for example, PXI1Slot3, where PXI1Slot3 is an instrument resource name. **resourceName** can also be a logical IVI name. This parameter accepts a comma-delimited list of strings in the form PXI1Slot2,PXI1Slot3, where PXI1Slot2 is one instrument resource name and PXI1Slot3 is another. When including more than one digital pattern instrument in the comma-delimited list of strings, list the instruments in the same order they appear in the pin map.

Note You only can specify multiple instruments of the same model. For example, you can list two PXIe-6570s but not a PXIe-6570 and PXIe-6571. The instruments must be in the same chassis.

- **id_query** (*bool*) – A Boolean that verifies that the digital pattern instrument you initialize is supported by NI-Digital. NI-Digital automatically performs this query, so setting this parameter is not necessary.

- **reset_device** (*bool*) – A Boolean that specifies whether to reset a digital pattern instrument to a known state when the session is initialized. Setting the **resetDevice** value to True is equivalent to calling the `nidigital.Session.reset()` method immediately after initializing the session.
- **options** (*dict*) – Specifies the initial value of certain properties for the session. The syntax for **options** is a dictionary of properties with an assigned value. For example:

```
{ 'simulate': False }
```

You do not have to specify a value for all the properties. If you do not specify a value for a property, the default value is used.

Advanced Example: { 'simulate': True, 'driver_setup': { 'Model': '<model number>', 'BoardType': '<type>' } }

Property	Default
range_check	True
query_instrument_status	False
cache	True
simulate	False
record_value_coersions	False
driver_setup	{ }

- **grpc_options** (`nidigital.GrpcSessionOptions`) – MeasurementLink gRPC session options

Methods

abort

`nidigital.Session.abort()`

Stops bursting the pattern.

abort_keep_alive

`nidigital.Session.abort_keep_alive()`

Stops the keep alive pattern if it is currently running. If a pattern burst is in progress, the method aborts the pattern burst. If you start a new pattern burst while a keep alive pattern is running, the keep alive pattern runs to the last keep alive vector, and the new pattern burst starts on the next cycle.

apply_levels_and_timing

`nidigital.Session.apply_levels_and_timing(levels_sheet, timing_sheet,
initial_state_high_pins=None,
initial_state_low_pins=None,
initial_state_tristate_pins=None)`

Applies digital levels and timing values defined in previously loaded levels and timing sheets. When applying a levels sheet, only the levels specified in the sheet are affected. Any levels not specified in the sheet remain unchanged. When applying a timing sheet, all existing time sets are deleted before the new time sets are loaded.

Tip: This method can be called on specific sites within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container sites to specify a subset, and then call this method on the result.

Example: `my_session.sites[...].apply_levels_and_timing()`

To call the method on all sites, you can call it directly on the `nidigital.Session`.

Example: `my_session.apply_levels_and_timing()`

Parameters

- **levels_sheet** (*str*) – Name of the levels sheet to apply. Use the name of the sheet or pass the absolute file path you use in the `nidigital.Session.load_specifications_levels_and_timing()` method. The name of the levels sheet is the file name without the directory and file extension.
- **timing_sheet** (*str*) – Name of the timing sheet to apply. Use the name of the sheet or pass the absolute file path that you use in the `nidigital.Session.load_specifications_levels_and_timing()` method. The name of the timing sheet is the file name without the directory and file extension.
- **initial_state_high_pins** (*basic sequence types or str*) – Comma-delimited list of pins, pin groups, or channels to initialize to a high state.
- **initial_state_low_pins** (*basic sequence types or str*) – Comma-delimited list of pins, pin groups, or channels to initialize to a low state.
- **initial_state_tristate_pins** (*basic sequence types or str*) – Comma-delimited list of pins, pin groups, or channels to initialize to a non-drive state (X)

apply_tdr_offsets

`nidigital.Session.apply_tdr_offsets(offsets)`

Applies the correction for propagation delay offsets to a digital pattern instrument. Use this method to apply TDR offsets that are stored from a past measurement or are measured by means other than the `nidigital.Session.tdr()` method. Also use this method to apply correction for offsets if the **applyOffsets** input of the `nidigital.Session.tdr()` method was set to False at the time of measurement.

Tip: This method can be called on specific channels within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels to specify a subset, and then call this method on the result.

Example: `my_session.channels[...].apply_tdr_offsets()`

To call the method on all channels, you can call it directly on the `nidigital.Session`.

Example: `my_session.apply_tdr_offsets()`

Parameters

offsets (*basic sequence of `hightime.timedelta`, `datetime.timedelta`, or `float` in seconds*) – TDR offsets to apply, in seconds. Specify

an offset for each pin or channel in the repeated capabilities. If the repeated capabilities contain pin names, you must specify offsets for each site in the channel map per pin.

burst_pattern

```
nidigital.Session.burst_pattern(start_label, select_digital_function=True,  
                                wait_until_done=True,  
                                timeout=hightime.timedelta(seconds=10.0))
```

Uses the `start_label` you specify to burst the pattern on the sites you specify. If you specify `wait_until_done` as `True`, waits for the burst to complete, and returns comparison results for each site.

Digital pins retain their state at the end of a pattern burst until the first vector of the pattern burst, a call to `nidigital.Session.write_static()`, or a call to `nidigital.Session.apply_levels_and_timing()`.

Tip: This method can be called on specific sites within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container sites to specify a subset, and then call this method on the result.

Example: `my_session.sites[...].burst_pattern()`

To call the method on all sites, you can call it directly on the `nidigital.Session`.

Example: `my_session.burst_pattern()`

Parameters

- **start_label** (*str*) – Pattern name or exported pattern label from which to start bursting the pattern.
- **select_digital_function** (*bool*) – A Boolean that specifies whether to select the digital method for the pins in the pattern prior to bursting.
- **wait_until_done** (*bool*) – A Boolean that indicates whether to wait until the bursting is complete.
- **timeout** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Maximum time (in seconds) allowed for this method to complete. If this method does not complete within this time interval, this method returns an error.

Return type

{ int: bool, int: bool, ... }

Returns

Dictionary where each key is a site number and value is pass/fail, if `wait_until_done` is specified as `True`. Else, `None`.

clock_generator_abort

`nidigital.Session.clock_generator_abort()`

Stops clock generation on the specified channel(s) or pin(s) and pin group(s).

Tip: This method can be called on specific channels within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels to specify a subset, and then call this method on the result.

Example: `my_session.channels[...].clock_generator_abort()`

To call the method on all channels, you can call it directly on the `nidigital.Session`.

Example: `my_session.clock_generator_abort()`

clock_generator_generate_clock

`nidigital.Session.clock_generator_generate_clock(frequency, select_digital_function=True)`

Configures clock generator frequency and initiates clock generation on the specified channel(s) or pin(s) and pin group(s).

Tip: This method can be called on specific channels within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels to specify a subset, and then call this method on the result.

Example: `my_session.channels[...].clock_generator_generate_clock()`

To call the method on all channels, you can call it directly on the `nidigital.Session`.

Example: `my_session.clock_generator_generate_clock()`

Parameters

- **frequency** (*float*) – The frequency of the clock generation, in Hz.
- **select_digital_function** (*bool*) – A Boolean that specifies whether to select the digital method for the pins specified prior to starting clock generation.

close

`nidigital.Session.close()`

Closes the specified instrument session to a digital pattern instrument, aborts pattern execution, and unloads pattern memory. The channels on a digital pattern instrument remain in their current state.

Note: This method is not needed when using the session context manager

commit

`nidigital.Session.commit()`

Applies all previously configured pin levels, termination modes, clocks, triggers, and pattern timing to a digital pattern instrument. If you do not call the `nidigital.Session.commit()` method, then the `initiate` method or the `nidigital.Session.burst_pattern()` method will implicitly call this method for you. Calling this method moves the session from the Uncommitted state to the Committed state.

configure_active_load_levels

`nidigital.Session.configure_active_load_levels(iol, ioh, vcom)`

Configures I_{OL} , I_{OH} , and V_{COM} levels for the active load on the pins you specify. The DUT sources or sinks current based on the level values. To enable active load, set the termination mode to `ACTIVE_LOAD`. To disable active load, set the termination mode of the instrument to `HIGH_Z` or `VTERM`.

Tip: This method can be called on specific channels within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels to specify a subset, and then call this method on the result.

Example: `my_session.channels[...].configure_active_load_levels()`

To call the method on all channels, you can call it directly on the `nidigital.Session`.

Example: `my_session.configure_active_load_levels()`

Parameters

- **iol** (*float*) – Maximum current that the DUT sinks while outputting a voltage below V_{COM} .
- **ioh** (*float*) – Maximum current that the DUT sources while outputting a voltage above V_{COM} .
- **vcom** (*float*) – Commutating voltage level at which the active load circuit switches between sourcing current and sinking current.

configure_pattern_burst_sites

`nidigital.Session.configure_pattern_burst_sites()`

Configures which sites burst the pattern on the next call to the `initiate` method. The pattern burst sites can also be modified through the repeated capabilities for the `nidigital.Session.burst_pattern()` method. If a site has been disabled through the `nidigital.Session.disable_sites()` method, the site does not burst a pattern even if included in the pattern burst sites.

Tip: This method can be called on specific sites within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container sites to specify a subset, and then call this method on the result.

Example: `my_session.sites[...].configure_pattern_burst_sites()`

To call the method on all sites, you can call it directly on the `nidigital.Session`.

Example: `my_session.configure_pattern_burst_sites()`

`configure_time_set_compare_edges_strobe`

`nidigital.Session.configure_time_set_compare_edges_strobe(time_set_name,
strobe_edge)`

Configures the strobe edge time for the specified pins. Use this method to modify time set values after applying a timing sheet with the `nidigital.Session.apply_levels_and_timing()` method, or to create time sets programmatically without the use of timing sheets. This method does not modify the timing sheet file or the timing sheet contents that will be used in future calls to `nidigital.Session.apply_levels_and_timing()`; it only affects the values of the current timing context.

Tip: This method can be called on specific pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].configure_time_set_compare_edges_strobe()`

To call the method on all pins, you can call it directly on the `nidigital.Session`.

Example: `my_session.configure_time_set_compare_edges_strobe()`

Parameters

- **time_set_name** (*str*) – The specified time set name.
- **strobe_edge** (*hightime.timedelta*, *datetime.timedelta*, or *float in seconds*) – Time when the comparison happens within a vector period.

`configure_time_set_compare_edges_strobe2x`

`nidigital.Session.configure_time_set_compare_edges_strobe2x(time_set_name,
strobe_edge,
strobe2_edge)`

Configures the compare strobes for the specified pins in the time set, including the 2x strobe. Use this method to modify time set values after applying a timing sheet with the `nidigital.Session.apply_levels_and_timing()` method, or to create time sets programmatically without the use of timing sheets. This method does not modify the timing sheet file or the timing sheet contents that will be used in future calls to `nidigital.Session.apply_levels_and_timing()`; it only affects the values of the current timing context.

Tip: This method can be called on specific pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].configure_time_set_compare_edges_strobe2x()`

To call the method on all pins, you can call it directly on the `nidigital.Session`.

Example: `my_session.configure_time_set_compare_edges_strobe2x()`

Parameters

- **time_set_name** (*str*) – The specified time set name.
- **strobe_edge** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Time when the comparison happens within a vector period.
- **strobe2_edge** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Time when the comparison happens for the second DUT cycle within a vector period.

configure_time_set_drive_edges

```
nidigital.Session.configure_time_set_drive_edges(time_set_name, format, drive_on_edge,  
                                                drive_data_edge, drive_return_edge,  
                                                drive_off_edge)
```

Configures the drive format and drive edge placement for the specified pins. Use this method to modify time set values after applying a timing sheet with the `nidigital.Session.apply_levels_and_timing()` method, or to create time sets programmatically without the use of timing sheets. This method does not modify the timing sheet file or the timing sheet contents that will be used in future calls to `nidigital.Session.apply_levels_and_timing()`; it only affects the values of the current timing context.

Tip: This method can be called on specific pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].configure_time_set_drive_edges()`

To call the method on all pins, you can call it directly on the `nidigital.Session`.

Example: `my_session.configure_time_set_drive_edges()`

Parameters

- **time_set_name** (*str*) – The specified time set name.
- **format** (`nidigital.DriveFormat`) – Drive format of the time set.
 - *NR*: Non-return.
 - *RL*: Return to low.
 - *RH*: Return to high.
 - *SBC*: Surround by complement.
- **drive_on_edge** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Delay, in seconds, from the beginning of the vector period for turning on the pin driver. This option applies only when the prior vector left the pin in a non-drive pin state (L, H, X, V, M, E). For the SBC format, this option specifies the delay from the beginning of the vector period at which the complement of the pattern value is driven.
- **drive_data_edge** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Delay, in seconds, from the beginning of the vector period until the pattern data is driven to the pattern value. The ending state from the previous vector persists until this point.

- **drive_return_edge** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Delay, in seconds, from the beginning of the vector period until the pin changes from the pattern data to the return value, as specified in the format.
- **drive_off_edge** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Delay, in seconds, from the beginning of the vector period to turn off the pin driver when the next vector period uses a non-drive symbol (L, H, X, V, M, E).

configure_time_set_drive_edges2x

```
nidigital.Session.configure_time_set_drive_edges2x(time_set_name, format,  
                                                    drive_on_edge, drive_data_edge,  
                                                    drive_return_edge, drive_off_edge,  
                                                    drive_data2_edge,  
                                                    drive_return2_edge)
```

Configures the drive edges of the pins in the time set, including 2x edges. Use this method to modify time set values after applying a timing sheet with the [nidigital.Session.apply_levels_and_timing\(\)](#) method, or to create time sets programmatically without the use of timing sheets. This method does not modify the timing sheet file or the timing sheet contents that will be used in future calls to [nidigital.Session.apply_levels_and_timing\(\)](#); it only affects the values of the current timing context.

Tip: This method can be called on specific pins within your [nidigital.Session](#) instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].configure_time_set_drive_edges2x()`

To call the method on all pins, you can call it directly on the [nidigital.Session](#).

Example: `my_session.configure_time_set_drive_edges2x()`

Parameters

- **time_set_name** (*str*) – The specified time set name.
- **format** ([nidigital.DriveFormat](#)) – Drive format of the time set.
 - [NR](#): Non-return.
 - [RL](#): Return to low.
 - [RH](#): Return to high.
 - [SBC](#): Surround by complement.
- **drive_on_edge** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Delay, in seconds, from the beginning of the vector period for turning on the pin driver. This option applies only when the prior vector left the pin in a non-drive pin state (L, H, X, V, M, E). For the SBC format, this option specifies the delay from the beginning of the vector period at which the complement of the pattern value is driven.
- **drive_data_edge** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Delay, in seconds, from the beginning of the vector period

until the pattern data is driven to the pattern value. The ending state from the previous vector persists until this point.

- **drive_return_edge** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Delay, in seconds, from the beginning of the vector period until the pin changes from the pattern data to the return value, as specified in the format.
- **drive_off_edge** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Delay, in seconds, from the beginning of the vector period to turn off the pin driver when the next vector period uses a non-drive symbol (L, H, X, V, M, E).
- **drive_data2_edge** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Delay, in seconds, from the beginning of the vector period until the pattern data in the second DUT cycle is driven to the pattern value.
- **drive_return2_edge** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Delay, in seconds, from the beginning of the vector period until the pin changes from the pattern data in the second DUT cycle to the return value, as specified in the format.

configure_time_set_drive_format

`nidigital.Session.configure_time_set_drive_format(time_set_name, drive_format)`

Configures the drive format for the pins specified in the **pinList**. Use this method to modify time set values after applying a timing sheet with the `nidigital.Session.apply_levels_and_timing()` method, or to create time sets programmatically without the use of timing sheets. This method does not modify the timing sheet file or the timing sheet contents that will be used in future calls to `nidigital.Session.apply_levels_and_timing()`; it only affects the values of the current timing context.

Tip: This method can be called on specific pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].configure_time_set_drive_format()`

To call the method on all pins, you can call it directly on the `nidigital.Session`.

Example: `my_session.configure_time_set_drive_format()`

Parameters

- **time_set_name** (*str*) – The specified time set name.
- **drive_format** (*nidigital.DriveFormat*) – Drive format of the time set.
 - *NR*: Non-return.
 - *RL*: Return to low.
 - *RH*: Return to high.
 - *SBC*: Surround by complement.

configure_time_set_edge

`nidigital.Session.configure_time_set_edge(time_set_name, edge, time)`

Configures the edge placement for the pins specified in the pin list. Use this method to modify time set values after applying a timing sheet with the `nidigital.Session.apply_levels_and_timing()` method, or to create time sets programmatically without the use of timing sheets. This method does not modify the timing sheet file or the timing sheet contents that will be used in future calls to `nidigital.Session.apply_levels_and_timing()`; it only affects the values of the current timing context.

Tip: This method can be called on specific pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].configure_time_set_edge()`

To call the method on all pins, you can call it directly on the `nidigital.Session`.

Example: `my_session.configure_time_set_edge()`

Parameters

- **time_set_name** (*str*) – The specified time set name.
- **edge** (`nidigital.TimeSetEdgeType`) – Name of the edge.
 - `DRIVE_ON`
 - `DRIVE_DATA`
 - `DRIVE_RETURN`
 - `DRIVE_OFF`
 - `COMPARE_STROBE`
 - `DRIVE_DATA2`
 - `DRIVE_RETURN2`
 - `COMPARE_STROBE2`
- **time** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – The time from the beginning of the vector period in which to place the edge.

configure_time_set_edge_multiplier

`nidigital.Session.configure_time_set_edge_multiplier(time_set_name, edge_multiplier)`

Configures the edge multiplier of the pins in the time set. Use this method to modify time set values after applying a timing sheet with the `nidigital.Session.apply_levels_and_timing()` method, or to create time sets programmatically without the use of timing sheets. This method does not modify the timing sheet file or the timing sheet contents that will be used in future calls to `nidigital.Session.apply_levels_and_timing()`; it only affects the values of the current timing context.

Tip: This method can be called on specific pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].configure_time_set_edge_multiplier()`

To call the method on all pins, you can call it directly on the `nidigital.Session`.

Example: `my_session.configure_time_set_edge_multiplier()`

Parameters

- **time_set_name** (*str*) – The specified time set name.
- **edge_multiplier** (*int*) – The specified edge multiplier for the pins in the pin list.

configure_time_set_period

`nidigital.Session.configure_time_set_period(time_set_name, period)`

Configures the period of a time set. Use this method to modify time set values after applying a timing sheet with the `nidigital.Session.apply_levels_and_timing()` method, or to create time sets programmatically without the use of timing sheets. This method does not modify the timing sheet file or the timing sheet contents that will be used in future calls to `nidigital.Session.apply_levels_and_timing()`; it only affects the values of the current timing context.

Parameters

- **time_set_name** (*str*) – The specified time set name.
- **period** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Period for this time set, in seconds.

configure_voltage_levels

`nidigital.Session.configure_voltage_levels(vil, vih, vol, voh, vterm)`

Configures voltage levels for the pins you specify.

Tip: This method can be called on specific channels within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels to specify a subset, and then call this method on the result.

Example: `my_session.channels[...].configure_voltage_levels()`

To call the method on all channels, you can call it directly on the `nidigital.Session`.

Example: `my_session.configure_voltage_levels()`

Parameters

- **vil** (*float*) – Voltage that the instrument will apply to the input of the DUT when the pin driver drives a logic low (0).
- **vih** (*float*) – Voltage that the instrument will apply to the input of the DUT when the test instrument drives a logic high (1).

- **vol** (*float*) – Output voltage below which the comparator on the pin driver interprets a logic low (L).
- **voh** (*float*) – Output voltage above which the comparator on the pin driver interprets a logic high (H).
- **vterm** (*float*) – Termination voltage the instrument applies during non-drive cycles when the termination mode is set to V_{term} . The instrument applies the termination voltage through a 50 ohm parallel termination resistance.

create_capture_waveform_from_file_digicapture

```
nidigital.Session.create_capture_waveform_from_file_digicapture(waveform_name,
                                                                wave-
                                                                form_file_path)
```

Creates a capture waveform with the configuration information from a Digicapture file generated by the Digital Pattern Editor.

Parameters

- **waveform_name** (*str*) – Waveform name you want to use. You must specify waveform_name if the file contains multiple waveforms. Use the waveform_name with the capture_start opcode in your pattern.
- **waveform_file_path** (*str*) – Absolute file path to the capture waveform file (.digicapture) you want to load.

create_capture_waveform_parallel

```
nidigital.Session.create_capture_waveform_parallel(waveform_name)
```

Sets the capture waveform settings for parallel acquisition. Settings apply across all sites if multiple sites are configured in the pin map. You cannot reconfigure settings after waveforms are created.

Tip: This method can be called on specific pins within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].create_capture_waveform_parallel()`

To call the method on all pins, you can call it directly on the *nidigital.Session*.

Example: `my_session.create_capture_waveform_parallel()`

Parameters

- **waveform_name** (*str*) – Waveform name you want to use. Use the waveform_name with the capture_start opcode in your pattern.

create_capture_waveform_serial

```
nidigital.Session.create_capture_waveform_serial(waveform_name, sample_width,  
                                                bit_order)
```

Sets the capture waveform settings for serial acquisition. Settings apply across all sites if multiple sites are configured in the pin map. You cannot reconfigure settings after waveforms are created.

Tip: This method can be called on specific pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].create_capture_waveform_serial()`

To call the method on all pins, you can call it directly on the `nidigital.Session`.

Example: `my_session.create_capture_waveform_serial()`

Parameters

- **waveform_name** (*str*) – Waveform name you want to use. Use the waveform_name with the capture_start opcode in your pattern.
- **sample_width** (*int*) – Width in bits of each serial sample. Valid values are between 1 and 32.
- **bit_order** (*nidigital.BitOrder*) – Order in which to shift the bits.
 - *MSB*: Specifies the bit order by most significant bit first.
 - *LSB*: Specifies the bit order by least significant bit first.

create_source_waveform_from_file_tdms

```
nidigital.Session.create_source_waveform_from_file_tdms(waveform_name,  
                                                         waveform_file_path,  
                                                         write_waveform_data=True)
```

Creates a source waveform with configuration information from a TDMS file generated by the Digital Pattern Editor. It also optionally writes waveform data from the file.

Parameters

- **waveform_name** (*str*) – The waveform name you want to use from the file. You must specify waveform_name if the file contains multiple waveforms. Use the waveform_name with the source_start opcode in your pattern.
- **waveform_file_path** (*str*) – Absolute file path to the load source waveform file (.tdms).
- **write_waveform_data** (*bool*) – A Boolean that writes waveform data to source memory if True and the waveform data is in the file.

create_source_waveform_parallel

`nidigital.Session.create_source_waveform_parallel(waveform_name, data_mapping)`

Sets the source waveform settings required for parallel sourcing. Settings apply across all sites if multiple sites are configured in the pin map. You cannot reconfigure settings after waveforms are created.

Tip: This method can be called on specific pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].create_source_waveform_parallel()`

To call the method on all pins, you can call it directly on the `nidigital.Session`.

Example: `my_session.create_source_waveform_parallel()`

Parameters

- **waveform_name** (*str*) – The name to assign to the waveform. Use the waveform_name with source_start opcode in your pattern.
- **data_mapping** (`nidigital.SourceDataMapping`) – Parameter that specifies how to map data on multiple sites.
 - *BROADCAST*: Broadcasts the waveform you specify to all sites.
 - *SITE_UNIQUE*: Sources unique waveform data to each site.

create_source_waveform_serial

`nidigital.Session.create_source_waveform_serial(waveform_name, data_mapping, sample_width, bit_order)`

Sets the source waveform settings required for serial sourcing. Settings apply across all sites if multiple sites are configured in the pin map. You cannot reconfigure settings after waveforms are created.

Tip: This method can be called on specific pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].create_source_waveform_serial()`

To call the method on all pins, you can call it directly on the `nidigital.Session`.

Example: `my_session.create_source_waveform_serial()`

Parameters

- **waveform_name** (*str*) – The name to assign to the waveform. Use the waveform_name with source_start opcode in your pattern.
- **data_mapping** (`nidigital.SourceDataMapping`) – Parameter that specifies how to map data on multiple sites.
 - *BROADCAST*: Broadcasts the waveform you specify to all sites.

- *SITE_UNIQUE*: Sources unique waveform data to each site.
- **sample_width** (*int*) – Width in bits of each serial sample. Valid values are between 1 and 32.
- **bit_order** (*nidigital.BitOrder*) – Order in which to shift the bits.
 - *MSB*: Specifies the bit order by most significant bit first.
 - *LSB*: Specifies the bit order by least significant bit first.

create_time_set

`nidigital.Session.create_time_set(name)`

Creates a time set with the name that you specify. Use this method when you want to create time sets programmatically rather than with a timing sheet.

Parameters

name (*str*) – The specified name of the new time set.

delete_all_time_sets

`nidigital.Session.delete_all_time_sets()`

Deletes all time sets from instrument memory.

disable_sites

`nidigital.Session.disable_sites()`

Disables specified sites. Disabled sites are not included in pattern bursts initiated by the `initiate` method or the `nidigital.Session.burst_pattern()` method, even if the site is specified in the list of pattern burst sites in `nidigital.Session.configure_pattern_burst_sites()` method or in the repeated capabilities for the `nidigital.Session.burst_pattern()` method. Additionally, if you specify a list of pin or pin group names in repeated capabilities in any NI-Digital method, digital pattern instrument channels mapped to disabled sites are not affected by the method. The methods that return per-pin data, such as the `nidigital.Session.ppmu_measure()` method, do not return data for channels mapped to disabled sites. The digital pattern instrument channels mapped to the sites specified are left in their current state. NI TestStand Semiconductor Module requires all sites to always be enabled, and manages the set of active sites without disabling the sites in the digital instrument session. Do not use this method with the Semiconductor Module.

Tip: This method can be called on specific sites within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container sites to specify a subset, and then call this method on the result.

Example: `my_session.sites[...].disable_sites()`

To call the method on all sites, you can call it directly on the `nidigital.Session`.

Example: `my_session.disable_sites()`

enable_sites

`nidigital.Session.enable_sites()`

Enables the sites you specify. All sites are enabled by default.

Tip: This method can be called on specific sites within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container sites to specify a subset, and then call this method on the result.

Example: `my_session.sites[...].enable_sites()`

To call the method on all sites, you can call it directly on the `nidigital.Session`.

Example: `my_session.enable_sites()`

fetch_capture_waveform

`nidigital.Session.fetch_capture_waveform(waveform_name, samples_to_read, timeout=hightime.timedelta(seconds=10.0))`

Returns dictionary where each key is a site number and value is a collection of digital states representing capture waveform data

Tip: This method can be called on specific sites within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container sites to specify a subset, and then call this method on the result.

Example: `my_session.sites[...].fetch_capture_waveform()`

To call the method on all sites, you can call it directly on the `nidigital.Session`.

Example: `my_session.fetch_capture_waveform()`

Parameters

- **waveform_name** (*str*) – Waveform name you create with the create capture waveform method. Use the waveform_name parameter with capture_start opcode in your pattern.
- **samples_to_read** (*int*) – Number of samples to fetch.
- **timeout** (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Maximum time (in seconds) allowed for this method to complete. If this method does not complete within this time interval, this method returns an error.

Return type

{ int: memoryview of `array.array` of unsigned int, int: memoryview of `array.array` of unsigned int, ... }

Returns

Dictionary where each key is a site number and value is a collection of digital states representing capture waveform data

fetch_history_ram_cycle_information

`nidigital.Session.fetch_history_ram_cycle_information(position, samples_to_read)`

Returns the pattern information acquired for the specified cycles.

If the pattern is using the edge multiplier feature, cycle numbers represent tester cycles, each of which may consist of multiple DUT cycles. When using pins with mixed edge multipliers, pins may return `PIN_STATE_NOT_ACQUIRED` for DUT cycles where those pins do not have edges defined.

Site number on which to retrieve pattern information must be specified via sites repeated capability. The method returns an error if more than one site is specified.

Pins for which to retrieve pattern information must be specified via pins repeated capability. If pins are not specified, pin list from the pattern containing the start label is used. Call `nidigital.Session.get_pattern_pin_names()` with the start label to retrieve the pins associated with the pattern burst:

```
session.sites[0].pins['PinA', 'PinB'].fetch_history_ram_cycle_
    ↪information(0, -1)
```

Note: Before bursting a pattern, you must configure the History RAM trigger and specify which cycles to acquire.

`nidigital.Session.history_ram_trigger_type` should be used to specify the trigger condition on which History RAM starts acquiring pattern information.

If History RAM trigger is configured as `CYCLE_NUMBER`, `nidigital.Session.cycle_number_history_ram_trigger_cycle_number` should be used to specify the cycle number on which History RAM starts acquiring pattern information.

If History RAM trigger is configured as `PATTERN_LABEL`, `nidigital.Session.pattern_label_history_ram_trigger_label` should be used to specify the pattern label from which to start acquiring pattern information. `nidigital.Session.pattern_label_history_ram_trigger_vector_offset` should be used to specify the number of vectors following the specified pattern label from which to start acquiring pattern information. `nidigital.Session.pattern_label_history_ram_trigger_cycle_offset` should be used to specify the number of cycles following the specified pattern label and vector offset from which to start acquiring pattern information.

For all History RAM trigger conditions, `nidigital.Session.history_ram_pretrigger_samples` should be used to specify the number of samples to acquire before the trigger conditions are met. If you configure History RAM to only acquire failed cycles, you must set `nidigital.Session.history_ram_pretrigger_samples` to 0.

`nidigital.Session.history_ram_cycles_to_acquire` should be used to specify which cycles History RAM acquires after the trigger conditions are met.

Tip: This method can be called on specific pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].fetch_history_ram_cycle_information()`

To call the method on all pins, you can call it directly on the `nidigital.Session`.

Example: `my_session.fetch_history_ram_cycle_information()`

Parameters

- **position** (*int*) – Sample index from which to start fetching pattern information.
- **samples_to_read** (*int*) – Number of samples to fetch. A value of -1 specifies to fetch all available samples.

Return type

list of HistoryRAMCycleInformation

Returns

Returns a list of class instances with the following information about each pattern cycle:

- **pattern_name** (str) Name of the pattern for the acquired cycle.
- **time_set_name** (str) Time set for the acquired cycle.
- **vector_number** (int) Vector number within the pattern for the acquired cycle. Vector numbers start at 0 from the beginning of the pattern.
- **cycle_number** (int) Cycle number acquired by this History RAM sample. Cycle numbers start at 0 from the beginning of the pattern burst.
- **scan_cycle_number** (int) Scan cycle number acquired by this History RAM sample. Scan cycle numbers start at 0 from the first cycle of the scan vector. Scan cycle numbers are -1 for cycles that do not have a scan opcode.
- **expected_pin_states** (list of list of enums.PinState) Pin states as expected by the loaded pattern in the order specified in the pin list. Pins without defined edges in the specified DUT cycle will have a value of *PIN_STATE_NOT_ACQUIRED*. Length of the outer list will be equal to the value of edge multiplier for the given vector. Length of the inner list will be equal to the number of pins requested.
- **actual_pin_states** (list of list of enums.PinState) Pin states acquired by History RAM in the order specified in the pin list. Pins without defined edges in the specified DUT cycle will have a value of *PIN_STATE_NOT_ACQUIRED*. Length of the outer list will be equal to the value of edge multiplier for the given vector. Length of the inner list will be equal to the number of pins requested.
- **per_pin_pass_fail** (list of list of bool) Pass fail information for pins in the order specified in the pin list. Pins without defined edges in the specified DUT cycle will have a value of pass (True). Length of the outer list will be equal to the value of edge multiplier for the given vector. Length of the inner list will be equal to the number of pins requested.

frequency_counter_measure_frequency

`nidigital.Session.frequency_counter_measure_frequency()`

Measures the frequency on the specified channel(s) over the specified measurement time. All channels in the repeated capabilities should have the same measurement time.

Tip: This method can be called on specific channels within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container channels to specify a subset, and then call this method on the result.

Example: `my_session.channels[...].frequency_counter_measure_frequency()`

To call the method on all channels, you can call it directly on the *nidigital.Session*.

Example: `my_session.frequency_counter_measure_frequency()`

Return type

list of float

Returns

The returned frequency counter measurement, in Hz. This method returns -1 if the measurement is invalid for the channel.

get_channel_names

`nidigital.Session.get_channel_names(indices)`

Returns a list of channel names for given channel indices.

Parameters

indices (*basic sequence types, str, or int*) – Index list for the channels in the session. Valid values are from zero to the total number of channels in the session minus one. The index string can be one of the following formats:

- A comma-separated list—for example, “0,2,3,1”
- A range using a hyphen—for example, “0-3”
- A range using a colon—for example, “0:3”

You can combine comma-separated lists and ranges that use a hyphen or colon. Both out-of-order and repeated indices are supported (“2,3,0”, “1,2,2,3”). White space characters, including spaces, tabs, feeds, and carriage returns, are allowed between characters. Ranges can be incrementing or decrementing.

Return type

list of str

Returns

The channel name(s) at the specified indices.

get_fail_count

`nidigital.Session.get_fail_count()`

Returns the comparison fail count for pins in the repeated capabilities.

Tip: This method can be called on specific channels within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels to specify a subset, and then call this method on the result.

Example: `my_session.channels[...].get_fail_count()`

To call the method on all channels, you can call it directly on the `nidigital.Session`.

Example: `my_session.get_fail_count()`

Return type

list of int

Returns

Number of failures in an array. If a site is disabled or not enabled for burst, the method does not return data for that site. You can also use the `nidigital.Session.get_pin_results_pin_information()` method to obtain a sorted list of returned sites and channels.

get_history_ram_sample_count

`nidigital.Session.get_history_ram_sample_count()`

Returns the number of samples History RAM acquired on the last pattern burst.

Note: Before bursting a pattern, you must configure the History RAM trigger and specify which cycles to acquire.

`nidigital.Session.history_ram_trigger_type` should be used to specify the trigger condition on which History RAM starts acquiring pattern information.

If History RAM trigger is configured as `CYCLE_NUMBER`, `nidigital.Session.cycle_number_history_ram_trigger_cycle_number` should be used to specify the cycle number on which History RAM starts acquiring pattern information.

If History RAM trigger is configured as `PATTERN_LABEL`, `nidigital.Session.pattern_label_history_ram_trigger_label` should be used to specify the pattern label from which to start acquiring pattern information. `nidigital.Session.pattern_label_history_ram_trigger_vector_offset` should be used to specify the number of vectors following the specified pattern label from which to start acquiring pattern information. `nidigital.Session.pattern_label_history_ram_trigger_cycle_offset` should be used to specify the number of cycles following the specified pattern label and vector offset from which to start acquiring pattern information.

For all History RAM trigger conditions, `nidigital.Session.history_ram_pretrigger_samples` should be used to specify the number of samples to acquire before the trigger conditions are met. If you configure History RAM to only acquire failed cycles, you must set `nidigital.Session.history_ram_pretrigger_samples` to 0.

`nidigital.Session.history_ram_cycles_to_acquire` should be used to specify which cycles History RAM acquires after the trigger conditions are met.

Tip: This method can be called on specific sites within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container sites to specify a subset, and then call this method on the result.

Example: `my_session.sites[...].get_history_ram_sample_count()`

To call the method on all sites, you can call it directly on the `nidigital.Session`.

Example: `my_session.get_history_ram_sample_count()`

Return type

`int`

Returns

The returned number of samples that History RAM acquired.

get_pattern_pin_names

`nidigital.Session.get_pattern_pin_names(start_label)`

Returns the pattern pin list.

Parameters

start_label (*str*) – Pattern name or exported pattern label from which to get the pin names that the pattern references.

Return type

list of str

Returns

List of pins referenced by the pattern with the **startLabel**.

get_pin_results_pin_information

`nidigital.Session.get_pin_results_pin_information()`

Returns the pin names, site numbers, and channel names that correspond to per-pin data read from the digital pattern instrument. The method returns pin information in the same order as values read using the `nidigital.Session.read_static()` method, `nidigital.Session.ppmu_measure()` method, and `nidigital.Session.get_fail_count()` method. Use this method to match values the previously listed methods return with pins, sites, and instrument channels.

Tip: This method can be called on specific channels within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels to specify a subset, and then call this method on the result.

Example: `my_session.channels[...].get_pin_results_pin_information()`

To call the method on all channels, you can call it directly on the `nidigital.Session`.

Example: `my_session.get_pin_results_pin_information()`

Return type

list of PinInfo

Returns

List of named tuples with fields:

- **pin_name** (str)
- **site_number** (int)
- **channel_name** (str)

get_site_pass_fail

`nidigital.Session.get_site_pass_fail()`

Returns dictionary where each key is a site number and value is pass/fail

Tip: This method can be called on specific sites within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container sites to specify a subset, and then call this method on the result.

Example: `my_session.sites[...].get_site_pass_fail()`

To call the method on all sites, you can call it directly on the *nidigital.Session*.

Example: `my_session.get_site_pass_fail()`

Return type

{ int: bool, int: bool, ... }

Returns

Dictionary where each key is a site number and value is pass/fail

get_time_set_drive_format

`nidigital.Session.get_time_set_drive_format(time_set_name)`

Returns the drive format of a pin in the specified time set.

Tip: This method can be called on specific pins within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].get_time_set_drive_format()`

To call the method on all pins, you can call it directly on the *nidigital.Session*.

Example: `my_session.get_time_set_drive_format()`

Parameters

time_set_name (*str*) – The specified time set name.

Return type

nidigital.DriveFormat

Returns

Returned drive format of the time set for the specified pin.

get_time_set_edge

`nidigital.Session.get_time_set_edge(time_set_name, edge)`

Returns the edge time of a pin in the specified time set.

Tip: This method can be called on specific pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].get_time_set_edge()`

To call the method on all pins, you can call it directly on the `nidigital.Session`.

Example: `my_session.get_time_set_edge()`

Parameters

- **time_set_name** (*str*) – The specified time set name.
- **edge** (`nidigital.TimeSetEdgeType`) – Name of the edge.
 - `DRIVE_ON`
 - `DRIVE_DATA`
 - `DRIVE_RETURN`
 - `DRIVE_OFF`
 - `COMPARE_STROBE`
 - `DRIVE_DATA2`
 - `DRIVE_RETURN2`
 - `COMPARE_STROBE2`

Return type

`hightime.timedelta`

Returns

Time from the beginning of the vector period in which to place the edge.

get_time_set_edge_multiplier

`nidigital.Session.get_time_set_edge_multiplier(time_set_name)`

Returns the edge multiplier of the specified time set.

Tip: This method can be called on specific pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container pins to specify a subset, and then call this method on the result.

Example: `my_session.pins[...].get_time_set_edge_multiplier()`

To call the method on all pins, you can call it directly on the `nidigital.Session`.

Example: `my_session.get_time_set_edge_multiplier()`

Parameters

time_set_name (*str*) – The specified time set name.

Return type

int

Returns

Returned edge multiplier of the time set for the specified pin.

get_time_set_period

`nidigital.Session.get_time_set_period(time_set_name)`

Returns the period of the specified time set.

Parameters

time_set_name (*str*) – The specified time set name.

Return type

hightime.timedelta

Returns

Returned period, in seconds, that the edge is configured to.

initiate

`nidigital.Session.initiate()`

Starts bursting the pattern configured by `nidigital.Session.start_label`, causing the NI-Digital session to be committed. To stop the pattern burst, call `nidigital.Session.abort()`. If keep alive pattern is bursting when `nidigital.Session.abort()` is called or upon exiting the context manager, keep alive pattern will not be stopped. To stop the keep alive pattern, call `nidigital.Session.abort_keep_alive()`.

Note: This method will return a Python context manager that will initiate on entering and abort on exit.

is_done

`nidigital.Session.is_done()`

Checks the hardware to determine if the pattern burst has completed or if any errors have occurred.

Return type

bool

Returns

A Boolean that indicates whether the pattern burst completed.

is_site_enabled

`nidigital.Session.is_site_enabled()`

Checks if a specified site is enabled.

Note: The method returns an error if more than one site is specified.

Tip: This method can be called on specific sites within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container sites to specify a subset, and then call this method on the result.

Example: `my_session.sites[...].is_site_enabled()`

To call the method on all sites, you can call it directly on the `nidigital.Session`.

Example: `my_session.is_site_enabled()`

Return type

`bool`

Returns

Boolean value that returns whether the site is enabled or disabled.

load_pattern

`nidigital.Session.load_pattern(file_path)`

Loads the specified pattern file.

Parameters

file_path (*str*) – Absolute file path of the binary .digipat pattern file to load. Specify the pattern to burst using `nidigital.Session.start_label` or the `start_label` parameter of the `nidigital.Session.burst_pattern()` method.

load_pin_map

`nidigital.Session.load_pin_map(file_path)`

Loads a pin map file. You can load only a single pin and channel map file during an NI-Digital Pattern Driver session. To switch pin maps, create a new session or call the `nidigital.Session.reset()` method.

Parameters

file_path (*str*) – Absolute file path to a pin map file created with the Digital Pattern Editor or the NI TestStand Semiconductor Module.

load_specifications_levels_and_timing

```
nidigital.Session.load_specifications_levels_and_timing(specifications_file_paths=None,  
                                                         levels_file_paths=None,  
                                                         timing_file_paths=None)
```

Loads settings in specifications, levels, and timing sheets. These settings are not applied to the digital pattern instrument until `nidigital.Session.apply_levels_and_timing()` is called.

If the levels and timing sheets contains formulas, they are evaluated at load time. If the formulas refer to variables, the specifications sheets that define those variables must be loaded either first, or at the same time as the levels and timing sheets.

Parameters

- **specifications_file_paths** (*str or basic sequence of str*) – Absolute file path of one or more specifications files.
- **levels_file_paths** (*str or basic sequence of str*) – Absolute file path of one or more levels sheet files.
- **timing_file_paths** (*str or basic sequence of str*) – Absolute file path of one or more timing sheet files.

lock

```
nidigital.Session.lock()
```

Obtains a multithread lock on the device session. Before doing so, the software waits until all other execution threads release their locks on the device session.

Other threads may have obtained a lock on this session for the following reasons:

- The application called the `nidigital.Session.lock()` method.
- A call to NI-Digital Pattern Driver locked the session.
- After a call to the `nidigital.Session.lock()` method returns successfully, no other threads can access the device session until you call the `nidigital.Session.unlock()` method or exit out of the with block when using lock context manager.
- Use the `nidigital.Session.lock()` method and the `nidigital.Session.unlock()` method around a sequence of calls to instrument driver methods if you require that the device retain its settings through the end of the sequence.

You can safely make nested calls to the `nidigital.Session.lock()` method within the same thread. To completely unlock the session, you must balance each call to the `nidigital.Session.lock()` method with a call to the `nidigital.Session.unlock()` method.

One method for ensuring there are the same number of unlock method calls as there is lock calls is to use lock as a context manager

```
with nidigital.Session('dev1') as session:  
    with session.lock():  
        # Calls to session within a single lock context
```

The first *with* block ensures the session is closed regardless of any exceptions raised

The second *with* block ensures that unlock is called regardless of any exceptions raised

Return type

context manager

Returns

When used in a *with* statement, `nidigital.Session.lock()` acts as a context manager and unlock will be called when the *with* block is exited

ppmu_measure

`nidigital.Session.ppmu_measure(measurement_type)`

Instructs the PPMU to measure voltage or current. This method can be called to take a voltage measurement even if the pin method is not set to PPMU.

Tip: This method can be called on specific channels within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels to specify a subset, and then call this method on the result.

Example: `my_session.channels[...].ppmu_measure()`

To call the method on all channels, you can call it directly on the `nidigital.Session`.

Example: `my_session.ppmu_measure()`

Parameters

measurement_type (`nidigital.PPMUMeasurementType`) – Parameter that specifies whether the PPMU measures voltage or current from the DUT.

- **CURRENT:** The PPMU measures current from the DUT.
- **VOLTAGE:** The PPMU measures voltage from the DUT.

Return type

list of float

Returns

The returned array of measurements in the order you specify in the repeated capabilities. If a site is disabled, the method does not return data for that site. You can also use the `nidigital.Session.get_pin_results_pin_information()` method to obtain a sorted list of returned sites and channels.

ppmu_source

`nidigital.Session.ppmu_source()`

Starts sourcing voltage or current from the PPMU. This method automatically selects the PPMU method. Changes to PPMU source settings do not take effect until you call this method. If you modify source settings after you call this method, you must call this method again for changes in the configuration to take effect.

Tip: This method can be called on specific channels within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels to specify a subset, and then call this method on the result.

Example: `my_session.channels[...].ppmu_source()`

To call the method on all channels, you can call it directly on the `nidigital.Session`.

Example: `my_session.ppmu_source()`

read_sequencer_flag

`nidigital.Session.read_sequencer_flag(flag)`

Reads the state of a pattern sequencer flag. Use pattern sequencer flags to coordinate execution between the pattern sequencer and a runtime test program.

Parameters

flag (`nidigital.SequencerFlag`) – The pattern sequencer flag you want to read.

- `FLAG0` (“seqflag0”): Reads pattern sequencer flag 0.
- `FLAG1` (“seqflag1”): Reads pattern sequencer flag 1.
- `FLAG2` (“seqflag2”): Reads pattern sequencer flag 2.
- `FLAG3` (“seqflag3”): Reads pattern sequencer flag 3.

Return type

`bool`

Returns

A Boolean that indicates the state of the pattern sequencer flag you specify.

read_sequencer_register

`nidigital.Session.read_sequencer_register(reg)`

Reads the value of a pattern sequencer register. Use pattern sequencer registers to pass numeric values between the pattern sequencer and a runtime test program. For example, you can use this method to read a register modified by the `write_reg` opcode during a pattern burst.

Parameters

reg (`nidigital.SequencerRegister`) – The sequencer register to read from.

- `REGISTER0` (“reg0”): Reads sequencer register 0.
- `REGISTER1` (“reg1”): Reads sequencer register 1.
- `REGISTER2` (“reg2”): Reads sequencer register 2.
- `REGISTER3` (“reg3”): Reads sequencer register 3.
- `REGISTER4` (“reg4”): Reads sequencer register 4.
- `REGISTER5` (“reg5”): Reads sequencer register 5.
- `REGISTER6` (“reg6”): Reads sequencer register 6.
- `REGISTER7` (“reg7”): Reads sequencer register 7.
- `REGISTER8` (“reg8”): Reads sequencer register 8.
- `REGISTER9` (“reg9”): Reads sequencer register 9.
- `REGISTER10` (“reg10”): Reads sequencer register 10.
- `REGISTER11` (“reg11”): Reads sequencer register 11.

- [`REGISTER12`](#) (“reg12”): Reads sequencer register 12.
- [`REGISTER13`](#) (“reg13”): Reads sequencer register 13.
- [`REGISTER14`](#) (“reg14”): Reads sequencer register 14.
- [`REGISTER15`](#) (“reg15”): Reads sequencer register 15.

Return type

`int`

Returns

Value read from the sequencer register.

`read_static`

`nidigital.Session.read_static()`

Reads the current state of comparators for pins you specify in the repeated capabilities. If there are uncommitted changes to levels or the termination mode, this method commits the changes to the pins.

Tip: This method can be called on specific channels within your [`nidigital.Session`](#) instance. Use Python index notation on the repeated capabilities container channels to specify a subset, and then call this method on the result.

Example: `my_session.channels[...].read_static()`

To call the method on all channels, you can call it directly on the [`nidigital.Session`](#).

Example: `my_session.read_static()`

Return type

list of [`nidigital.PinState`](#)

Returns

The returned array of pin states read from the channels in the repeated capabilities. Data is returned in the order you specify in the repeated capabilities. If a site is disabled, the method does not return data for that site. You can also use the [`nidigital.Session.get_pin_results_pin_information\(\)`](#) method to obtain a sorted list of returned sites and channels.

- *L*: The comparators read a logic low pin state.
- *H*: The comparators read a logic high pin state.
- *M*: The comparators read a midband pin state.
- *V*: The comparators read a value that is above VOH and below VOL, which can occur when you set VOL higher than VOH.

reset

`nidigital.Session.reset()`

Returns a digital pattern instrument to a known state. This method performs the following actions:

- Aborts pattern execution.
- Clears pin maps, time sets, source and capture waveforms, and patterns.
- Resets all properties to default values, including the `nidigital.Session.selected_function` property that is set to `DISCONNECT`, causing the I/O switches to open.
- Stops exporting all external signals and events.

reset_device

`nidigital.Session.reset_device()`

Returns a digital pattern instrument to a known state. This method performs the following actions:

- Aborts pattern execution.
- Clears pin maps, time sets, source and capture waveforms, and patterns.
- Resets all properties to default values, including the `nidigital.Session.selected_function` property that is set to `DISCONNECT`, causing the I/O switches to open.
- Stops export of all external signals and events.
- Clears over-temperature and over-power conditions.

self_calibrate

`nidigital.Session.self_calibrate()`

Performs self-calibration on a digital pattern instrument.

self_test

`nidigital.Session.self_test()`

Returns self test results from a digital pattern instrument. This test requires several minutes to execute.

Raises `SelfTestError` on self test failure. Properties on exception object:

- `code` - failure code from driver
- `message` - status message from driver

Self-Test Code	Description
0	Self test passed.
1	Self test failed.

send_software_edge_trigger

`nidigital.Session.send_software_edge_trigger(trigger, trigger_identifier)`

Forces a particular edge-based trigger to occur regardless of how the specified trigger is configured. You can use this method as a software override.

Parameters

- **trigger** (*nidigital.SoftwareTrigger*) – Trigger specifies the trigger you want to override.

Defined Values	
<i>START</i>	Overrides the Start trigger. You must specify an empty string in the <code>trigger_identifier</code> parameter.
<i>CONDITIONAL_JUMP</i>	Specifies to route a conditional jump trigger. You must specify a conditional jump trigger in the <code>trigger_identifier</code> parameter.

Note: One or more of the referenced values are not in the Python API for this driver. Enums that only define values, or represent True/False, have been removed.

- **trigger_identifier** (*str*) – Trigger Identifier specifies the instance of the trigger you want to override. If trigger is specified as `NIDIGITAL_VAL_START_TRIGGER`, this parameter must be an empty string. If trigger is specified as `NIDIGITAL_VAL_CONDITIONAL_JUMP_TRIGGER`, allowed values are `conditionalJumpTrigger0`, `conditionalJumpTrigger1`, `conditionalJumpTrigger2`, and `conditionalJumpTrigger3`.

Note: One or more of the referenced values are not in the Python API for this driver. Enums that only define values, or represent True/False, have been removed.

tdr

`nidigital.Session.tdr(apply_offsets=True)`

Measures propagation delays through cables, connectors, and load boards using Time-Domain Reflectometry (TDR). Ensure that the channels and pins you select are connected to an open circuit.

Tip: This method can be called on specific channels within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container channels to specify a subset, and then call this method on the result.

Example: `my_session.channels[...].tdr()`

To call the method on all channels, you can call it directly on the *nidigital.Session*.

Example: `my_session.tdr()`

Parameters

- **apply_offsets** (*bool*) – A Boolean that specifies whether to apply the measured

TDR offsets. If you need to adjust the measured offsets prior to applying, set this input to False, and call the `nidigital.Session.apply_tdr_offsets()` method to specify the adjusted TDR offsets values.

Return type

`list` of `hightime.timedelta`

Returns

Measured TDR offsets specified in seconds.

unload_all_patterns

`nidigital.Session.unload_all_patterns(unload_keep_alive_pattern=False)`

Unloads all patterns, source waveforms, and capture waveforms from a digital pattern instrument.

Parameters

unload_keep_alive_pattern (*bool*) – A Boolean that specifies whether to keep or unload the keep alive pattern.

unload_specifications

`nidigital.Session.unload_specifications(file_paths)`

Unloads the given specifications sheets present in the previously loaded specifications files that you select.

You must call `nidigital.Session.load_specifications_levels_and_timing()` to reload the files with updated specifications values. You must then call `nidigital.Session.apply_levels_and_timing()` in order to apply the levels and timing values that reference the updated specifications values.

Parameters

file_paths (*str* or *basic sequence of str*) – Absolute file path of one or more loaded specifications files.

unlock

`nidigital.Session.unlock()`

Releases a lock that you acquired on an device session using `nidigital.Session.lock()`. Refer to `nidigital.Session.unlock()` for additional information on session locks.

wait_until_done

`nidigital.Session.wait_until_done(timeout=hightime.timedelta(seconds=10.0))`

Waits until the pattern burst has completed or the timeout has expired.

Parameters

timeout (*hightime.timedelta, datetime.timedelta, or float in seconds*) – Maximum time (in seconds) allowed for this method to complete. If this method does not complete within this time interval, this method returns an error.

write_sequencer_flag

`nidigital.Session.write_sequencer_flag(flag, value)`

Writes the state of a pattern sequencer flag. Use pattern sequencer flags to coordinate execution between the pattern sequencer and a runtime test program.

Parameters

- **flag** (*nidigital.SequencerFlag*) – The pattern sequencer flag to write.
 - *FLAG0* (“seqflag0”): Writes pattern sequencer flag 0.
 - *FLAG1* (“seqflag1”): Writes pattern sequencer flag 1.
 - *FLAG2* (“seqflag2”): Writes pattern sequencer flag 2.
 - *FLAG3* (“seqflag3”): Writes pattern sequencer flag 3.
- **value** (*bool*) – A Boolean that assigns a state to the pattern sequencer flag you specify.

write_sequencer_register

`nidigital.Session.write_sequencer_register(reg, value)`

Writes a value to a pattern sequencer register. Use pattern sequencer registers to pass numeric values between the pattern sequencer and a runtime test program.

Parameters

- **reg** (*nidigital.SequencerRegister*) – The sequencer register you want to write to.
 - *REGISTER0* (“reg0”): Writes sequencer register 0.
 - *REGISTER1* (“reg1”): Writes sequencer register 1.
 - *REGISTER2* (“reg2”): Writes sequencer register 2.
 - *REGISTER3* (“reg3”): Writes sequencer register 3.
 - *REGISTER4* (“reg4”): Writes sequencer register 4.
 - *REGISTER5* (“reg5”): Writes sequencer register 5.
 - *REGISTER6* (“reg6”): Writes sequencer register 6.
 - *REGISTER7* (“reg7”): Writes sequencer register 7.
 - *REGISTER8* (“reg8”): Writes sequencer register 8.
 - *REGISTER9* (“reg9”): Writes sequencer register 9.
 - *REGISTER10* (“reg10”): Writes sequencer register 10.
 - *REGISTER11* (“reg11”): Writes sequencer register 11.
 - *REGISTER12* (“reg12”): Writes sequencer register 12.
 - *REGISTER13* (“reg13”): Writes sequencer register 13.
 - *REGISTER14* (“reg14”): Writes sequencer register 14.
 - *REGISTER15* (“reg15”): Writes sequencer register 15.
- **value** (*int*) – The value you want to write to the register.

write_source_waveform_broadcast

`nidigital.Session.write_source_waveform_broadcast(waveform_name, waveform_data)`

Writes the same waveform data to all sites. Use this write method if you set the `data_mapping` parameter of the create source waveform method to [BROADCAST](#).

Parameters

- **waveform_name** (*str*) – The name to assign to the waveform. Use the waveform_name with source_start opcode in your pattern.
- **waveform_data** (*list of int*) – 1D array of samples to use as source data to apply to all sites.

write_source_waveform_data_from_file_tdms

`nidigital.Session.write_source_waveform_data_from_file_tdms(waveform_name,
waveform_file_path)`

Writes a source waveform based on the waveform data and configuration information the file contains.

Parameters

- **waveform_name** (*str*) – The name to assign to the waveform. Use the waveform_name with source_start opcode in your pattern.
- **waveform_file_path** (*str*) – Absolute file path to the load source waveform file (.tdms).

write_source_waveform_site_unique

`nidigital.Session.write_source_waveform_site_unique(waveform_name, waveform_data)`

Writes one waveform per site. Use this write method if you set the parameter of the create source waveform method to Site Unique.

Parameters

- **waveform_name** (*str*) – The name to assign to the waveform. Use the waveform_name with source_start opcode in your pattern.
- **waveform_data** (*{ int: basic sequence of unsigned int, int: basic sequence of unsigned int, ... }*) – Dictionary where each key is a site number and value is a collection of samples to use as source data

write_static

`nidigital.Session.write_static(state)`

Writes a static state to the specified pins. The selected pins remain in the specified state until the next pattern burst or call to this method. If there are uncommitted changes to levels or the termination mode, this method commits the changes to the pins. This method does not change the selected pin method. If you write a static state to a pin that does not have the Digital method selected, the new static state is stored by the instrument, and affects the state of the pin the next time you change the selected method to Digital.

Tip: This method can be called on specific channels within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels to specify a subset, and then call this method on the result.

Example: `my_session.channels[...].write_static()`

To call the method on all channels, you can call it directly on the `nidigital.Session`.

Example: `my_session.write_static()`

Parameters

state (`nidigital.WriteStaticPinState`) – Parameter that specifies one of the following digital states to assign to the pin.

- `ZERO`: Specifies to drive low.
- `ONE`: Specifies to drive high.
- `X`: Specifies to not drive.

Note: One or more of the referenced values are not in the Python API for this driver. Enums that only define values, or represent True/False, have been removed.

Properties

`active_load_ioh`

`nidigital.Session.active_load_ioh`

Specifies the current that the DUT sources to the active load while outputting a voltage above VCOM.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].active_load_ioh`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.active_load_ioh`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: `NIDIGITAL_ATTR_ACTIVE_LOAD_IOH`
-

active_load_iol

`nidigital.Session.active_load_iol`

Specifies the current that the DUT sinks from the active load while outputting a voltage below VCOM.

Tip: This property can be set/get on specific channels or pins within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].active_load_iol`

To set/get on all channels or pins, you can call the property directly on the *nidigital.Session*.

Example: `my_session.active_load_iol`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_ACTIVE_LOAD_IOL**
-

active_load_vcom

`nidigital.Session.active_load_vcom`

Specifies the voltage level at which the active load circuit switches between sourcing current and sinking current.

Tip: This property can be set/get on specific channels or pins within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].active_load_vcom`

To set/get on all channels or pins, you can call the property directly on the *nidigital.Session*.

Example: `my_session.active_load_vcom`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_ACTIVE_LOAD_VCOM**
-

cache

`nidigital.Session.cache`

Specifies whether to cache the value of properties. When caching is enabled, the instrument driver keeps track of the current instrument settings and avoids sending redundant commands to the instrument. This significantly increases execution speed. Caching is always enabled in the driver, regardless of the value of this property.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_CACHE**
-

channel_count

`nidigital.Session.channel_count`

Returns the number of channels that the specific digital pattern instrument driver supports.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	int
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_CHANNEL_COUNT**
-

clock_generator_frequency

`nidigital.Session.clock_generator_frequency`

Specifies the frequency for the clock generator.

Tip: This property can be set/get on specific channels or pins within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].clock_generator_frequency`

To set/get on all channels or pins, you can call the property directly on the *nidigital.Session*.

Example: `my_session.clock_generator_frequency`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_CLOCK_GENERATOR_FREQUENCY**
-

clock_generator_is_running

`nidigital.Session.clock_generator_is_running`

Indicates whether the clock generator is running.

Tip: This property can be set/get on specific channels or pins within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].clock_generator_is_running`

To set/get on all channels or pins, you can call the property directly on the *nidigital.Session*.

Example: `my_session.clock_generator_is_running`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read only
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: `NIDIGITAL_ATTR_CLOCK_GENERATOR_IS_RUNNING`
-

conditional_jump_trigger_terminal_name

`nidigital.Session.conditional_jump_trigger_terminal_name`

Specifies the terminal name from which the exported conditional jump trigger signal may be routed to other instruments through the PXI trigger bus. You can use this signal to trigger other instruments when the conditional jump trigger instance asserts on the digital pattern instrument.

Tip: This property can be set/get on specific conditional_jump_triggers within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container conditional_jump_triggers to specify a subset.

Example: `my_session.conditional_jump_triggers[...].conditional_jump_trigger_terminal_name`

To set/get on all conditional_jump_triggers, you can call the property directly on the *nidigital.Session*.

Example: `my_session.conditional_jump_trigger_terminal_name`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	conditional_jump_triggers

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: `NIDIGITAL_ATTR_CONDITIONAL_JUMP_TRIGGER_TERMINAL_NAME`
-

conditional_jump_trigger_type

`nidigital.Session.conditional_jump_trigger_type`

Disables the conditional jump trigger or configures it for either hardware triggering or software triggering. The default value is *NONE*.

Valid Values:	
<i>NONE</i>	Disables the conditional jump trigger.
<i>DIGITAL_EDGE</i>	Configures the conditional jump trigger for hardware triggering.
<i>SOFTWARE</i>	Configures the conditional jump trigger for software triggering.

Tip: This property can be set/get on specific `conditional_jump_triggers` within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container `conditional_jump_triggers` to specify a subset.

Example: `my_session.conditional_jump_triggers[...].conditional_jump_trigger_type`

To set/get on all `conditional_jump_triggers`, you can call the property directly on the `nidigital.Session`.

Example: `my_session.conditional_jump_trigger_type`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	<code>enums.TriggerType</code>
Permissions	read-write
Repeated Capabilities	<code>conditional_jump_triggers</code>

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_CONDITIONAL_JUMP_TRIGGER_TYPE**
-

`cycle_number_history_ram_trigger_cycle_number`

`nidigital.Session.cycle_number_history_ram_trigger_cycle_number`

Specifies the cycle number on which History RAM starts acquiring pattern information when configured for a cycle number trigger.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	<code>int</code>
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_CYCLE_NUMBER_HISTORY_RAM_TRIGGER_CYCLE_NUMBER**
-

digital_edge_conditional_jump_trigger_edge

`nidigital.Session.digital_edge_conditional_jump_trigger_edge`

Configures the active edge of the incoming trigger signal for the conditional jump trigger instance. The default value is *RISING*.

Valid Values:	
<i>RISING</i>	Specifies the signal transition from low level to high level.
<i>FALLING</i>	Specifies the signal transition from high level to low level.

Tip: This property can be set/get on specific conditional_jump_triggers within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container conditional_jump_triggers to specify a subset.

Example: `my_session.conditional_jump_triggers[...].digital_edge_conditional_jump_trigger_edge`

To set/get on all conditional_jump_triggers, you can call the property directly on the *nidigital.Session*.

Example: `my_session.digital_edge_conditional_jump_trigger_edge`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	<code>enums.DigitalEdge</code>
Permissions	read-write
Repeated Capabilities	<code>conditional_jump_triggers</code>

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: `NIDIGITAL_ATTR_DIGITAL_EDGE_CONDITIONAL_JUMP_TRIGGER_EDGE`

digital_edge_conditional_jump_trigger_source

`nidigital.Session.digital_edge_conditional_jump_trigger_source`

Configures the digital trigger source terminal for a conditional jump trigger instance. The PXIe-6570/6571 supports triggering through the PXI trigger bus. You can specify source terminals in one of two ways. If the digital pattern instrument is named Dev1 and your terminal is PXI_Trig0, you can specify the terminal with the fully qualified terminal name, `/Dev1/PXI_Trig0`, or with the shortened terminal name, `PXI_Trig0`. The source terminal can also be a terminal from another device, in which case the NI-Digital Pattern Driver automatically finds a route (if one is available) from that terminal to the input terminal (going through a physical PXI backplane trigger line). For example, you can set the source terminal on Dev1 to be `/Dev2/ConditionalJumpTrigger0`. The default value is `VI_NULL`.

Valid Values:
String identifier to any valid terminal name

Tip: This property can be set/get on specific conditional_jump_triggers within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container conditional_jump_triggers to specify a subset.

Example: `my_session.conditional_jump_triggers[...].digital_edge_conditional_jump_trigger_source`

To set/get on all conditional_jump_triggers, you can call the property directly on the *nidigital.Session*.

Example: `my_session.digital_edge_conditional_jump_trigger_source`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read-write
Repeated Capabilities	conditional_jump_triggers

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_DIGITAL_EDGE_CONDITIONAL_JUMP_TRIGGER_SOURCE**
-

digital_edge_rio_trigger_edge

`nidigital.Session.digital_edge_rio_trigger_edge`

Configures the active edge of the incoming trigger signal for the RIO trigger instance. The default value is *RISING*.

Valid Values:	
<i>RISING</i>	Specifies the signal transition from low level to high level.
<i>FALLING</i>	Specifies the signal transition from high level to low level.

Tip: This property can be set/get on specific rio_triggers within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container rio_triggers to specify a subset.

Example: `my_session.rio_triggers[...].digital_edge_rio_trigger_edge`

To set/get on all rio_triggers, you can call the property directly on the *nidigital.Session*.

Example: `my_session.digital_edge_rio_trigger_edge`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	enums.DigitalEdge
Permissions	read-write
Repeated Capabilities	rio_triggers

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_DIGITAL_EDGE_RIO_TRIGGER_EDGE**
-

digital_edge_rio_trigger_source

`nidigital.Session.digital_edge_rio_trigger_source`

Configures the digital trigger source terminal for a RIO trigger instance. The PXIe-6570/6571 supports triggering through the PXI trigger bus. You can specify source terminals in one of two ways. If the digital pattern instrument is named Dev1 and your terminal is PXI_Trig0, you can specify the terminal with the fully qualified terminal name, /Dev1/PXI_Trig0, or with the shortened terminal name, PXI_Trig0. The source terminal can also be a terminal from another device, in which case the NI-Digital Pattern Driver automatically finds a route (if one is available) from that terminal to the input terminal (going through a physical PXI backplane trigger line). For example, you can set the source terminal on Dev1 to be /Dev2/RIOTrigger0. The default value is VI_NULL.

Valid Values:
String identifier to any valid terminal name

Tip: This property can be set/get on specific `rio_triggers` within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container `rio_triggers` to specify a subset.

Example: `my_session.rio_triggers[...].digital_edge_rio_trigger_source`

To set/get on all `rio_triggers`, you can call the property directly on the `nidigital.Session`.

Example: `my_session.digital_edge_rio_trigger_source`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read-write
Repeated Capabilities	rio_triggers

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_DIGITAL_EDGE_RIO_TRIGGER_SOURCE**
-

digital_edge_start_trigger_edge

`nidigital.Session.digital_edge_start_trigger_edge`

Specifies the active edge for the Start trigger. This property is used when the `nidigital.Session.start_trigger_type` property is set to Digital Edge.

Defined Values:	
<i>RISING</i>	Asserts the trigger when the signal transitions from low level to high level.
<i>FALLING</i>	Asserts the trigger when the signal transitions from high level to low level.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	<code>enums.DigitalEdge</code>
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_DIGITAL_EDGE_START_TRIGGER_EDGE**
-

digital_edge_start_trigger_source

`nidigital.Session.digital_edge_start_trigger_source`

Specifies the source terminal for the Start trigger. This property is used when the `nidigital.Session.start_trigger_type` property is set to Digital Edge. You can specify source terminals in one of two ways. If the digital pattern instrument is named Dev1 and your terminal is PXI_Trig0, you can specify the terminal with the fully qualified terminal name, `/Dev1/PXI_Trig0`, or with the shortened terminal name, `PXI_Trig0`. The source terminal can also be a terminal from another device, in which case the NI-Digital Pattern Driver automatically finds a route (if one is available) from that terminal to the input terminal (going through a physical PXI backplane trigger line). For example, you can set the source terminal on Dev1 to be `/Dev2/StartTrigger`.

Defined Values:	
PXI_Trig0	PXI trigger line 0
PXI_Trig1	PXI trigger line 1
PXI_Trig2	PXI trigger line 2
PXI_Trig3	PXI trigger line 3
PXI_Trig4	PXI trigger line 4
PXI_Trig5	PXI trigger line 5
PXI_Trig6	PXI trigger line 6
PXI_Trig7	PXI trigger line 7

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_DIGITAL_EDGE_START_TRIGGER_SOURCE**
-

driver_setup

`nidigital.Session.driver_setup`

This property returns initial values for NI-Digital Pattern Driver properties as a string.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_DRIVER_SETUP**
-

exported_conditional_jump_trigger_output_terminal

`nidigital.Session.exported_conditional_jump_trigger_output_terminal`

Specifies the terminal to output the exported signal of the specified instance of the conditional jump trigger. The default value is `VI_NULL`.

Valid Values:	
<code>VI_NULL ("")</code>	Returns an empty string
<code>PXI_Trig0</code>	PXI trigger line 0
<code>PXI_Trig1</code>	PXI trigger line 1
<code>PXI_Trig2</code>	PXI trigger line 2
<code>PXI_Trig3</code>	PXI trigger line 3
<code>PXI_Trig4</code>	PXI trigger line 4
<code>PXI_Trig5</code>	PXI trigger line 5
<code>PXI_Trig6</code>	PXI trigger line 6
<code>PXI_Trig7</code>	PXI trigger line 7

Tip: This property can be set/get on specific conditional_jump_triggers within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container conditional_jump_triggers to specify a subset.

Example: `my_session.conditional_jump_triggers[...].exported_conditional_jump_trigger_output_terminal`

To set/get on all conditional_jump_triggers, you can call the property directly on the *nidigital.Session*.

Example: `my_session.exported_conditional_jump_trigger_output_terminal`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read-write
Repeated Capabilities	conditional_jump_triggers

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: `NIDIGITAL_ATTR_EXPORTED_CONDITIONAL_JUMP_TRIGGER_OUTPUT_TERMINAL`
-

exported_pattern_opcode_event_output_terminal

`nidigital.Session.exported_pattern_opcode_event_output_terminal`

Specifies the destination terminal for exporting the Pattern Opcode Event. Terminals can be specified in one of two ways. If the digital pattern instrument is named Dev1 and your terminal is PXI_Trig0, you can specify the terminal with the fully qualified terminal name, /Dev1/PXI_Trig0, or with the shortened terminal name, PXI_Trig0.

Defined Values:	
PXI_Trig0	PXI trigger line 0
PXI_Trig1	PXI trigger line 1
PXI_Trig2	PXI trigger line 2
PXI_Trig3	PXI trigger line 3
PXI_Trig4	PXI trigger line 4
PXI_Trig5	PXI trigger line 5
PXI_Trig6	PXI trigger line 6
PXI_Trig7	PXI trigger line 7

Tip: This property can be set/get on specific pattern_opcode_events within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container pattern_opcode_events to specify a subset.

Example: `my_session.pattern_opcode_events[...].exported_pattern_opcode_event_output_terminal`

To set/get on all pattern_opcode_events, you can call the property directly on the *nidigital.Session*.

Example: `my_session.exported_pattern_opcode_event_output_terminal`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read-write
Repeated Capabilities	pattern_opcode_events

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_EXPORTED_PATTERN_OPCODE_EVENT_OUTPUT_TERMINAL**

exported_rio_event_output_terminal

`nidigital.Session.exported_rio_event_output_terminal`

Specifies the destination terminal for exporting the RIO Event. Terminals can be specified in one of two ways. If the digital pattern instrument is named Dev1 and your terminal is PXI_Trig0, you can specify the terminal with the fully qualified terminal name, `/Dev1/PXI_Trig0`, or with the shortened terminal name, `PXI_Trig0`.

Defined Values:	
PXI_Trig0	PXI trigger line 0
PXI_Trig1	PXI trigger line 1
PXI_Trig2	PXI trigger line 2
PXI_Trig3	PXI trigger line 3
PXI_Trig4	PXI trigger line 4
PXI_Trig5	PXI trigger line 5
PXI_Trig6	PXI trigger line 6
PXI_Trig7	PXI trigger line 7

Tip: This property can be set/get on specific `rio_events` within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container `rio_events` to specify a subset.

Example: `my_session.rio_events[...].exported_rio_event_output_terminal`

To set/get on all `rio_events`, you can call the property directly on the `nidigital.Session`.

Example: `my_session.exported_rio_event_output_terminal`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read-write
Repeated Capabilities	rio_events

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_EXPORTED_RIO_EVENT_OUTPUT_TERMINAL**
-

exported_start_trigger_output_terminal

`nidigital.Session.exported_start_trigger_output_terminal`

Specifies the destination terminal for exporting the Start trigger. Terminals can be specified in one of two ways. If the digital pattern instrument is named Dev1 and your terminal is PXI_Trig0, you can specify the terminal with the fully qualified terminal name, /Dev1/PXI_Trig0, or with the shortened terminal name, PXI_Trig0.

Defined Values:	
Do not export signal	The signal is not exported.
PXI_Trig0	PXI trigger line 0
PXI_Trig1	PXI trigger line 1
PXI_Trig2	PXI trigger line 2
PXI_Trig3	PXI trigger line 3
PXI_Trig4	PXI trigger line 4
PXI_Trig5	PXI trigger line 5
PXI_Trig6	PXI trigger line 6
PXI_Trig7	PXI trigger line 7

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_EXPORTED_START_TRIGGER_OUTPUT_TERMINAL**
-

frequency_counter_hysteresis_enabled

`nidigital.Session.frequency_counter_hysteresis_enabled`

Specifies whether hysteresis is enabled for the frequency counters of the digital pattern instrument.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_FREQUENCY_COUNTER_HYSTERESIS_ENABLED**
-

frequency_counter_measurement_mode

`nidigital.Session.frequency_counter_measurement_mode`

Determines how the frequency counters of the digital pattern instrument make measurements.

Valid
Val-
ues:

BANK Each discrete frequency counter is mapped to specific channels and makes frequency measurements from only those channels. Use banked mode when you need access to the full measure frequency range of the instrument. **Note:** If you request frequency measurements from multiple channels within the same bank, the measurements are made in series for the channels in that bank.

PARA All discrete frequency counters make frequency measurements from all channels in parallel with one another. Use parallel mode to increase the speed of frequency measurements if you do not need access to the full measure frequency range of the instrument; in parallel mode, you can also add `nidigital.Session.frequency_counter_hysteresis_enabled` to reduce measurement noise.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	<code>enums.FrequencyMeasurementMode</code>
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_FREQUENCY_COUNTER_MEASUREMENT_MODE**
-

frequency_counter_measurement_time

`nidigital.Session.frequency_counter_measurement_time`

Specifies the measurement time for the frequency counter.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].frequency_counter_measurement_time`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.frequency_counter_measurement_time`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float in seconds or datetime.timedelta
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_FREQUENCY_COUNTER_MEASUREMENT_TIME**
-

group_capabilities

`nidigital.Session.group_capabilities`

Returns a string that contains a comma-separated list of class-extension groups that the driver implements.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_GROUP_CAPABILITIES**
-

halt_on_keep_alive_opcode

`nidigital.Session.halt_on_keep_alive_opcode`

Specifies whether keep_alive opcodes should behave like halt opcodes.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_HALT_ON_KEEP_ALIVE_OPCODE**
-

history_ram_buffer_size_per_site

`nidigital.Session.history_ram_buffer_size_per_site`

Specifies the size, in samples, of the host memory buffer. The default value is 32000.

Valid Values:
0-INT64_MAX

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	int
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_HISTORY_RAM_BUFFER_SIZE_PER_SITE**
-

history_ram_cycles_to_acquire

`nidigital.Session.history_ram_cycles_to_acquire`

Configures which cycles History RAM acquires after the trigger conditions are met. If you configure History RAM to only acquire failed cycles, you must set the pretrigger samples for History RAM to 0.

Defined Values:	Values:
<i>FAILED</i>	Only acquires cycles that fail a compare after the triggering conditions are met.
<i>ALL</i>	Acquires all cycles after the triggering conditions are met.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	enums.HistoryRAMCyclesToAcquire
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_HISTORY_RAM_CYCLES_TO_ACQUIRE**
-

history_ram_max_samples_to_acquire_per_site

`nidigital.Session.history_ram_max_samples_to_acquire_per_site`

Specifies the maximum number of History RAM samples to acquire per site. If the property is set to -1, it will acquire until the History RAM buffer is full.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	int
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_HISTORY_RAM_MAX_SAMPLES_TO_ACQUIRE_PER_SITE**
-

history_ram_number_of_samples_is_finite

`nidigital.Session.history_ram_number_of_samples_is_finite`

Specifies whether the instrument acquires a finite number of History Ram samples or acquires continuously. The maximum number of samples that will be acquired when this property is set to True is determined by the instrument History RAM depth specification and the History RAM Max Samples to Acquire Per Site property. The default value is True.

Valid Values:	
True	Specifies that History RAM results will not stream into the host buffer until a History RAM fetch API is called.
False	Specifies that History RAM results will automatically start streaming into a host buffer after a pattern is burst and the History RAM has triggered.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_HISTORY_RAM_NUMBER_OF_SAMPLES_IS_FINITE**
-

history_ram_pretrigger_samples

`nidigital.Session.history_ram_pretrigger_samples`

Specifies the number of samples to acquire before the trigger conditions are met. If you configure History RAM to only acquire failed cycles, you must set the pretrigger samples for History RAM to 0.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	int
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_HISTORY_RAM_PRETRIGGER_SAMPLES**

history_ram_trigger_type

`nidigital.Session.history_ram_trigger_type`

Specifies the type of trigger condition on which History RAM starts acquiring pattern information.

Defined Values:	
<i>FIRST_FAIL</i>	Starts acquiring pattern information in History RAM on the first failed cycle in a pattern burst.
<i>CYCLE_NUM</i>	Starts acquiring pattern information in History RAM starting from a specified cycle number.
<i>PATTERN_LABEL</i>	Starts acquiring pattern information in History RAM starting from a specified pattern label, augmented by vector and cycle offsets.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	<code>enums.HistoryRAMTriggerType</code>
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_HISTORY_RAM_TRIGGER_TYPE**

instrument_firmware_revision

`nidigital.Session.instrument_firmware_revision`

Returns a string that contains the firmware revision information for the digital pattern instrument.

Tip: This property can be set/get on specific instruments within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container instruments to specify a subset.

Example: `my_session.instruments[...].instrument_firmware_revision`

To set/get on all instruments, you can call the property directly on the `nidigital.Session`.

Example: `my_session.instrument_firmware_revision`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	instruments

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_INSTRUMENT_FIRMWARE_REVISION**
-

instrument_manufacturer

`nidigital.Session.instrument_manufacturer`

Returns a string (“National Instruments”) that contains the name of the manufacturer of the digital pattern instrument.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_INSTRUMENT_MANUFACTURER**
-

instrument_model

`nidigital.Session.instrument_model`

Returns a string that contains the model number or name of the digital pattern instrument.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_INSTRUMENT_MODEL**

interchange_check

`nidigital.Session.interchange_check`

This property is not supported.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_INTERCHANGE_CHECK**

io_resource_descriptor

`nidigital.Session.io_resource_descriptor`

Returns a string that contains the resource descriptor that the NI-Digital Pattern Driver uses to identify the digital pattern instrument.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_IO_RESOURCE_DESCRIPTOR**
-

is_keep_alive_active

`nidigital.Session.is_keep_alive_active`

Returns True if the digital pattern instrument is driving the keep alive pattern.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_IS_KEEP_ALIVE_ACTIVE**
-

logical_name

`nidigital.Session.logical_name`

Returns a string containing the logical name that you specified when opening the current IVI session. This property is not supported.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_LOGICAL_NAME**
-

mask_compare

`nidigital.Session.mask_compare`

Specifies whether the pattern comparisons are masked or not. When set to True for a specified pin, failures on that pin will be masked.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].mask_compare`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.mask_compare`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_MASK_COMPARE**

pattern_label_history_ram_trigger_cycle_offset

`nidigital.Session.pattern_label_history_ram_trigger_cycle_offset`

Specifies the number of cycles that follow the specified pattern label and vector offset, after which History RAM will start acquiring pattern information when configured for a pattern label trigger.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	int
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_PATTERN_LABEL_HISTORY_RAM_TRIGGER_CYCLE_OFFSET**

`pattern_label_history_ram_trigger_label`

`nidigital.Session.pattern_label_history_ram_trigger_label`

Specifies the pattern label, augmented by the vector and cycle offset, to determine the point where History RAM will start acquiring pattern information when configured for a pattern label trigger.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_PATTERN_LABEL_HISTORY_RAM_TRIGGER_LABEL**
-

`pattern_label_history_ram_trigger_vector_offset`

`nidigital.Session.pattern_label_history_ram_trigger_vector_offset`

Specifies the number of vectors that follow the specified pattern label, after which History RAM will start acquiring pattern information when configured for a pattern label trigger.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	int
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_PATTERN_LABEL_HISTORY_RAM_TRIGGER_VECTOR_OFFSET**
-

`pattern_opcode_event_terminal_name`

`nidigital.Session.pattern_opcode_event_terminal_name`

Specifies the terminal name for the output trigger signal of the specified instance of a Pattern Opcode Event. You can use this terminal name as an input signal source for another trigger.

Tip: This property can be set/get on specific `pattern_opcode_events` within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container `pattern_opcode_events` to specify a subset.

Example: `my_session.pattern_opcode_events[...].pattern_opcode_event_terminal_name`

To set/get on all pattern_opcode_events, you can call the property directly on the `nidigital.Session`.

Example: `my_session.pattern_opcode_event_terminal_name`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	pattern_opcode_events

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: `NIDIGITAL_ATTR_PATTERN_OPCODE_EVENT_TERMINAL_NAME`

ppmu_allow_extended_voltage_range

`nidigital.Session.ppmu_allow_extended_voltage_range`

Enables the instrument to operate in additional voltage ranges where instrument specifications may differ from standard ranges. When set to True, this property enables extended voltage range operation. Review specification deviations for application suitability before using this property. NI recommends setting this property to False when not using the extended voltage range to avoid unintentional use of this range. The extended voltage range is supported only for PPMU, with the output method set to DC Voltage. A voltage glitch may occur when you change the PPMU output voltage from a standard range to the extended voltage range, or vice-versa, while the PPMU is sourcing. NI recommends temporarily changing the `nidigital.Session.selected_function` property to Off before sourcing a voltage level that requires a range change.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].ppmu_allow_extended_voltage_range`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.ppmu_allow_extended_voltage_range`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: `NIDIGITAL_ATTR_PPMU_ALLOW_EXTENDED_VOLTAGE_RANGE`
-

ppmu_aperture_time

`nidigital.Session.ppmu_aperture_time`

Specifies the measurement aperture time for the PPMU. The `nidigital.Session.ppmu_aperture_time_units` property sets the units of the PPMU aperture time.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].ppmu_aperture_time`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.ppmu_aperture_time`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: `NIDIGITAL_ATTR_PPMU_APERTURE_TIME`
-

ppmu_aperture_time_units

`nidigital.Session.ppmu_aperture_time_units`

Specifies the units of the measurement aperture time for the PPMU.

Defined Values:	
<code>SECONDS</code>	Specifies the aperture time in seconds.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].ppmu_aperture_time_units`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.ppmu_aperture_time_units`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	enums.PPMUApertureTimeUnits
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_PPMU_APERTURE_TIME_UNITS**
-

ppmu_current_level

`nidigital.Session.ppmu_current_level`

Specifies the current level, in amps, that the PPMU forces to the DUT. This property is applicable only when you set the `nidigital.Session.ppmu_output_function` property to DC Current. Specify valid values for the current level using the `nidigital.Session.PPMU_ConfigureCurrentLevelRange()` method.

Note: One or more of the referenced methods are not in the Python API for this driver.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].ppmu_current_level`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.ppmu_current_level`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_PPMU_CURRENT_LEVEL**
-

ppmu_current_level_range

`nidigital.Session.ppmu_current_level_range`

Specifies the range of valid values for the current level, in amps, that the PPMU forces to the DUT. This property is applicable only when you set the `nidigital.Session.ppmu_output_function` property to DC Current.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].ppmu_current_level_range`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.ppmu_current_level_range`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: `NIDIGITAL_ATTR_PPMU_CURRENT_LEVEL_RANGE`
-

ppmu_current_limit

`nidigital.Session.ppmu_current_limit`

Specifies the current limit, in amps, that the output cannot exceed while the PPMU forces voltage to the DUT. This property is applicable only when you set the `nidigital.Session.ppmu_output_function` property to DC Voltage. The PXIe-6570/6571 does not support the `nidigital.Session.ppmu_current_limit` property and only allows configuration of the `nidigital.Session.ppmu_current_limit_range` property.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].ppmu_current_limit`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.ppmu_current_limit`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_PPMU_CURRENT_LIMIT**
-

ppmu_current_limit_behavior

`nidigital.Session.ppmu_current_limit_behavior`

Specifies how the output should behave when the current limit is reached.

Defined Values:	
<i>REGULATE</i>	Controls output current so that it does not exceed the current limit. Power continues to generate even if the current limit is reached.

Tip: This property can be set/get on specific channels or pins within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].ppmu_current_limit_behavior`

To set/get on all channels or pins, you can call the property directly on the *nidigital.Session*.

Example: `my_session.ppmu_current_limit_behavior`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	<code>enums.PPMUCurrentLimitBehavior</code>
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_PPMU_CURRENT_LIMIT_BEHAVIOR**
-

ppmu_current_limit_range

`nidigital.Session.ppmu_current_limit_range`

Specifies the valid range, in amps, to which the current limit can be set while the PPMU forces voltage to the DUT. This property is applicable only when you set the `nidigital.Session.ppmu_output_function` property to DC Voltage.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].ppmu_current_limit_range`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.ppmu_current_limit_range`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: `NIDIGITAL_ATTR_PPMU_CURRENT_LIMIT_RANGE`
-

ppmu_current_limit_supported

`nidigital.Session.ppmu_current_limit_supported`

Returns whether the device supports configuration of a current limit when you set the `nidigital.Session.ppmu_output_function` property to DC Voltage.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].ppmu_current_limit_supported`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.ppmu_current_limit_supported`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read only
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_PPMU_CURRENT_LIMIT_SUPPORTED**
-

ppmu_output_function

`nidigital.Session.ppmu_output_function`

Specifies whether the PPMU forces voltage or current to the DUT.

Defined Values:	
<i>VOLTAGE</i>	Specifies the output method to DC Voltage.
<i>CURRENT</i>	Specifies the output method to DC Current.

Tip: This property can be set/get on specific channels or pins within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].ppmu_output_function`

To set/get on all channels or pins, you can call the property directly on the *nidigital.Session*.

Example: `my_session.ppmu_output_function`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	<code>enums.PPMUOutputFunction</code>
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_PPMU_OUTPUT_FUNCTION**
-

ppmu_voltage_level

`nidigital.Session.ppmu_voltage_level`

Specifies the voltage level, in volts, that the PPMU forces to the DUT. This property is applicable only when you set the *nidigital.Session.ppmu_output_function* property to DC Voltage.

Tip: This property can be set/get on specific channels or pins within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].ppmu_voltage_level`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.ppmu_voltage_level`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_PPMU_VOLTAGE_LEVEL**
-

`ppmu_voltage_limit_high`

`nidigital.Session.ppmu_voltage_limit_high`

Specifies the maximum voltage limit, or high clamp voltage (V_{CH}), in volts, at the pin when the PPMU forces current to the DUT. This property is applicable only when you set the `nidigital.Session.ppmu_output_function` property to DC Current.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].ppmu_voltage_limit_high`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.ppmu_voltage_limit_high`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_PPMU_VOLTAGE_LIMIT_HIGH**
-

ppmu_voltage_limit_low

`nidigital.Session.ppmu_voltage_limit_low`

Specifies the minimum voltage limit, or low clamp voltage (V_{CL}), in volts, at the pin when the PPMU forces current to the DUT. This property is applicable only when you set the `nidigital.Session.ppmu_output_function` property to DC Current.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].ppmu_voltage_limit_low`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.ppmu_voltage_limit_low`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_PPMU_VOLTAGE_LIMIT_LOW**

query_instrument_status

`nidigital.Session.query_instrument_status`

Specifies whether the NI-Digital Pattern Driver queries the digital pattern instrument status after each operation. The instrument status is always queried, regardless of the property setting.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_QUERY_INSTRUMENT_STATUS**

range_check

`nidigital.Session.range_check`

Checks the range and validates parameter and property values you pass to NI-Digital Pattern Driver methods. Ranges are always checked, regardless of the property setting.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_RANGE_CHECK**
-

record_coercions

`nidigital.Session.record_coercions`

Specifies whether the IVI engine keeps a list of the value coercions it makes for integer and real type properties. Enabling record value coercions is not supported.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_RECORD_COERCIONS**
-

rio_event_terminal_name

`nidigital.Session.rio_event_terminal_name`

Specifies the terminal name for the output signal of the specified instance of a RIO Event. You can use this terminal name as an input signal source for another trigger.

Tip: This property can be set/get on specific `rio_events` within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container `rio_events` to specify a subset.

Example: `my_session.rio_events[...].rio_event_terminal_name`

To set/get on all `rio_events`, you can call the property directly on the `nidigital.Session`.

Example: `my_session.rio_event_terminal_name`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	rio_events

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_RIO_EVENT_TERMINAL_NAME**
-

rio_trigger_terminal_name

`nidigital.Session.rio_trigger_terminal_name`

Specifies the terminal name from which the exported RIO trigger signal may be routed to other instruments through the PXI trigger bus. You can use this signal to trigger other instruments when the RIO trigger instance asserts on the digital pattern instrument.

Tip: This property can be set/get on specific `rio_triggers` within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container `rio_triggers` to specify a subset.

Example: `my_session.rio_triggers[...].rio_trigger_terminal_name`

To set/get on all `rio_triggers`, you can call the property directly on the `nidigital.Session`.

Example: `my_session.rio_trigger_terminal_name`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	rio_triggers

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_RIO_TRIGGER_TERMINAL_NAME**
-

rio_trigger_type

`nidigital.Session.rio_trigger_type`

Disables the rio trigger or configures it for hardware triggering. The default value is *NONE*.

Valid Values:	
<i>NONE</i>	Disables the conditional jump trigger.
<i>DIGITAL_EDGE</i>	Configures the conditional jump trigger for hardware triggering.

Tip: This property can be set/get on specific rio_triggers within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container `rio_triggers` to specify a subset.

Example: `my_session.rio_triggers[...].rio_trigger_type`

To set/get on all rio_triggers, you can call the property directly on the *nidigital.Session*.

Example: `my_session.rio_trigger_type`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	<code>enums.TriggerType</code>
Permissions	read-write
Repeated Capabilities	<code>rio_triggers</code>

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_RIO_TRIGGER_TYPE**
-

selected_function

`nidigital.Session.selected_function`

Caution: In the Disconnect state, some I/O protection and sensing circuitry remains exposed. Do not subject the instrument to voltage beyond its operating range.

Specifies whether digital pattern instrument channels are controlled by the pattern sequencer or PPMU, disconnected, or off.

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DIGI The pin is connected to the driver, comparator, and active load methods. The PPMU is not sourcing, but can make voltage measurements. The state of the digital pin driver when you change the `nidigital.Session.selected_function` to Digital is determined by the most recent call to the `nidigital.Session.write_static()` method or the last vector of the most recently executed pattern burst, whichever happened last. Use the `nidigital.Session.write_static()` method to control the state of the digital pin driver through software. Use the `nidigital.Session.burst_pattern()` method to control the state of the digital pin driver through a pattern. Set the `selectDigitalFunction` parameter of the `nidigital.Session.burst_pattern()` method to True to automatically switch the `nidigital.Session.selected_function` of the pins in the pattern burst to **DIGITAL**.

PPMU The pin is connected to the PPMU. The driver, comparator, and active load are off while this method is selected. Call the `nidigital.Session.ppmu_source()` method to source a voltage or current. The `nidigital.Session.ppmu_source()` method automatically switches the `nidigital.Session.selected_function` to the PPMU state and starts sourcing from the PPMU. Changing the `nidigital.Session.selected_function` to **DISCONNECT**, **OFF**, or **DIGITAL** causes the PPMU to stop sourcing. If you set the `nidigital.Session.selected_function` property to PPMU, the PPMU is initially not sourcing.

OFF The pin is electrically connected, and the PPMU and digital pin driver are off while this method is selected.

DISC The pin is electrically disconnected from instrument methods. Selecting this method causes the PPMU to stop sourcing prior to disconnecting the pin.

Note: You can make PPMU voltage measurements using the `nidigital.Session.ppmu_measure()` method from within any `nidigital.Session.selected_function`.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].selected_function`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.selected_function`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	<code>enums.SelectedFunction</code>
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_SELECTED_FUNCTION**
-

sequencer_flag_terminal_name

`nidigital.Session.sequencer_flag_terminal_name`

Specifies the terminal name for the output trigger signal of the Sequencer Flags trigger. You can use this terminal name as an input signal source for another trigger.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_SEQUENCER_FLAG_TERMINAL_NAME**
-

serial_number

`nidigital.Session.serial_number`

Returns the serial number of the device.

Tip: This property can be set/get on specific instruments within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container instruments to specify a subset.

Example: `my_session.instruments[...].serial_number`

To set/get on all instruments, you can call the property directly on the `nidigital.Session`.

Example: `my_session.serial_number`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	instruments

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_SERIAL_NUMBER**
-

simulate

`nidigital.Session.simulate`

Simulates I/O operations. After you open a session, you cannot change the simulation state. Use the `nidigital.Session.__init__()` method to enable simulation.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_SIMULATE**
-

specific_driver_class_spec_major_version

`nidigital.Session.specific_driver_class_spec_major_version`

Returns the major version number of the class specification with which NI-Digital is compliant. This property is not supported.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	int
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_SPECIFIC_DRIVER_CLASS_SPEC_MAJOR_VERSION**
-

specific_driver_class_spec_minor_version

`nidigital.Session.specific_driver_class_spec_minor_version`

Returns the minor version number of the class specification with which NI-Digital is compliant. This property is not supported.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	int
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_SPECIFIC_DRIVER_CLASS_SPEC_MINOR_VERSION**
-

specific_driver_description

nidigital.Session.specific_driver_description

Returns a string that contains a brief description of the NI-Digital Pattern driver.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_SPECIFIC_DRIVER_DESCRIPTION**
-

specific_driver_prefix

nidigital.Session.specific_driver_prefix

Returns a string that contains the prefix for the NI-Digital Pattern driver.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_SPECIFIC_DRIVER_PREFIX**
-

specific_driver_revision

`nidigital.Session.specific_driver_revision`

Returns a string that contains additional version information about the NI-Digital Pattern Driver. For example, the driver can return Driver: NI-Digital 16.0 as the value of this property.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_SPECIFIC_DRIVER_REVISION**

specific_driver_vendor

`nidigital.Session.specific_driver_vendor`

Returns a string (“National Instruments”) that contains the name of the vendor that supplies the NI-Digital Pattern Driver.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_SPECIFIC_DRIVER_VENDOR**

start_label

`nidigital.Session.start_label`

Specifies the pattern name or exported pattern label from which to start bursting the pattern.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_START_LABEL**
-

start_trigger_terminal_name

`nidigital.Session.start_trigger_terminal_name`

Specifies the terminal name for the output trigger signal of the Start trigger. You can use this terminal name as an input signal source for another trigger.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_START_TRIGGER_TERMINAL_NAME**
-

start_trigger_type

`nidigital.Session.start_trigger_type`

Specifies the Start trigger type. The digital pattern instrument waits for this trigger after you call the `nidigital.Session.init()` method or the `nidigital.Session.burst_pattern()` method, and does not burst a pattern until this trigger is received.

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NONE Disables the Start trigger. Pattern bursting starts immediately after you call the `nidigital.Session.init()` method or the `nidigital.Session.burst_pattern()` method.

DIGIT Pattern bursting does not start until the digital pattern instrument detects a digital edge.

SOFTWARE Pattern bursting does not start until the digital pattern instrument receives a software Start trigger. Create a software Start trigger by calling the `nidigital.Session.send_software_edge_trigger()` method and selecting start trigger in the **trigger** parameter. Related information: `SendSoftwareEdgeTrigger` method.

Note: One or more of the referenced methods are not in the Python API for this driver.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	enums.TriggerType
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_START_TRIGGER_TYPE**
-

supported_instrument_models

`nidigital.Session.supported_instrument_models`

Returns a comma delimited string that contains the supported digital pattern instrument models for the specific driver.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	str
Permissions	read only
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_SUPPORTED_INSTRUMENT_MODELS**
-

tdr_endpoint_termination

`nidigital.Session.tdr_endpoint_termination`

Specifies whether TDR Channels are connected to an open circuit or a short to ground.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	enums.TDREndpointTermination
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_TDR_ENDPOINT_TERMINATION**
-

tdr_offset

`nidigital.Session.tdr_offset`

Specifies the TDR Offset.

Tip: This property can be set/get on specific channels or pins within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].tdr_offset`

To set/get on all channels or pins, you can call the property directly on the *nidigital.Session*.

Example: `my_session.tdr_offset`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	hightime.timedelta, datetime.timedelta, or float in seconds
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_TDR_OFFSET**
-

termination_mode

`nidigital.Session.termination_mode`

Specifies the behavior of the pin during non-drive cycles.

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ACTI Specifies that, for non-drive pin states (L, H, X, V, M, E), the active load is connected and the instrument sources or sinks a defined amount of current to load the DUT. The amount of current sourced by the instrument and therefore sunk by the DUT is specified by IOL. The amount of current sunk by the instrument and therefore sourced by the DUT is specified by IOH. The voltage at which the instrument changes between sourcing and sinking is specified by VCOM.

VTER Specifies that, for non-drive pin states (L, H, X, V, M, E), the pin driver terminates the pin to the configured VTERM voltage through a 50 impedance. VTERM is adjustable to allow for the pin to terminate at a set level. This is useful for instruments that might operate incorrectly if an instrument pin is unterminated and is allowed to float to any voltage level within the instrument voltage range. To address this issue, enable VTERM by configuring the VTERM pin level to the desired voltage and selecting the VTERM termination mode. Setting VTERM to 0 V and selecting the VTERM termination mode has the effect of connecting a 50 termination to ground, which provides an effective 50 impedance for the pin. This can be useful for improving signal integrity of certain DUTs by reducing reflections while the DUT drives the pin.

HIGH Specifies that, for non-drive pin states (L, H, X, V, M, E), the pin driver is put in a high-impedance state and the active load is disabled.

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].termination_mode`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.termination_mode`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	<code>enums.TerminationMode</code>
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_TERMINATION_MODE**

timing_absolute_delay

`nidigital.Session.timing_absolute_delay`

Specifies a timing delay, measured in seconds, and applies the delay to the digital pattern instrument in addition to TDR and calibration adjustments. If the `nidigital.Session.timing_absolute_delay_enabled` property is set to True, this value is the intermodule skew measured by NI-TC1k. You can modify this value to override the timing delay and align the I/O timing of this instrument with another instrument that shares the same reference clock. If the `nidigital.Session.timing_absolute_delay_enabled` property is False, this property will return 0.0. Changing the `nidigital.Session.timing_absolute_delay_enabled` property from False to True will set the `nidigital.Session.timing_absolute_delay` value back to your previously set value.

Tip: This property can be set/get on specific instruments within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container instruments to specify a subset.

Example: `my_session.instruments[...].timing_absolute_delay`

To set/get on all instruments, you can call the property directly on the `nidigital.Session`.

Example: `my_session.timing_absolute_delay`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	hightime.timedelta, datetime.timedelta, or float in seconds
Permissions	read-write
Repeated Capabilities	instruments

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_TIMING_ABSOLUTE_DELAY**
-

timing_absolute_delay_enabled

`nidigital.Session.timing_absolute_delay_enabled`

Specifies whether the `nidigital.Session.timing_absolute_delay` property should be applied to adjust the digital pattern instrument timing reference relative to other instruments in the system. Do not use this feature with digital pattern instruments in a Semiconductor Test System (STS). Timing absolute delay conflicts with the adjustment performed during STS timing calibration. When set to True, the digital pattern instrument automatically adjusts the timing absolute delay to correct the instrument timing reference relative to other instruments in the system for better timing alignment among synchronized instruments.

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	bool
Permissions	read-write
Repeated Capabilities	None

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_TIMING_ABSOLUTE_DELAY_ENABLED**
-

vih

`nidigital.Session.vih`

Specifies the voltage that the digital pattern instrument will apply to the input of the DUT when the test instrument drives a logic high (1).

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].vih`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.vih`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_VIH**
-

vil

`nidigital.Session.vil`

Specifies the voltage that the digital pattern instrument will apply to the input of the DUT when the test instrument drives a logic low (0).

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].vil`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.vil`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_VIL**
-

voh

`nidigital.Session.voh`

Specifies the output voltage from the DUT above which the comparator on the digital pattern test instrument interprets a logic high (H).

Tip: This property can be set/get on specific channels or pins within your `nidigital.Session` instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].voh`

To set/get on all channels or pins, you can call the property directly on the `nidigital.Session`.

Example: `my_session.voh`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_VOH**
-

vol**nidigital.Session.vol**

Specifies the output voltage from the DUT below which the comparator on the digital pattern test instrument interprets a logic low (L).

Tip: This property can be set/get on specific channels or pins within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].vol`

To set/get on all channels or pins, you can call the property directly on the *nidigital.Session*.

Example: `my_session.vol`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_VOL**
-

vterm**nidigital.Session.vterm**

Specifies the termination voltage the digital pattern instrument applies during non-drive cycles when the termination mode is set to V_{term} . The instrument applies the termination voltage through a 50 parallel termination resistance.

Tip: This property can be set/get on specific channels or pins within your *nidigital.Session* instance. Use Python index notation on the repeated capabilities container channels or pins to specify a subset.

Example: `my_session.channels[...].vterm`

To set/get on all channels or pins, you can call the property directly on the *nidigital.Session*.

Example: `my_session.vterm`

The following table lists the characteristics of this property.

Characteristic	Value
Datatype	float
Permissions	read-write
Repeated Capabilities	channels, pins

Tip: This property corresponds to the following LabVIEW Property or C Attribute:

- C Attribute: **NIDIGITAL_ATTR_VTERM**
-

NI-TClk Support

`nidigital.Session.tclk`

This is used to get and set NI-TClk attributes on the session.

See also:

See [nitclk.SessionReference](#) for a complete list of attributes.

Session

- *Session*
- *Methods*
 - *abort*
 - *abort_keep_alive*
 - *apply_levels_and_timing*
 - *apply_tdr_offsets*
 - *burst_pattern*
 - *clock_generator_abort*
 - *clock_generator_generate_clock*
 - *close*
 - *commit*
 - *configure_active_load_levels*
 - *configure_pattern_burst_sites*
 - *configure_time_set_compare_edges_strobe*
 - *configure_time_set_compare_edges_strobe2x*
 - *configure_time_set_drive_edges*
 - *configure_time_set_drive_edges2x*
 - *configure_time_set_drive_format*
 - *configure_time_set_edge*
 - *configure_time_set_edge_multiplier*
 - *configure_time_set_period*
 - *configure_voltage_levels*
 - *create_capture_waveform_from_file_digicapture*
 - *create_capture_waveform_parallel*

- *create_capture_waveform_serial*
- *create_source_waveform_from_file_tdms*
- *create_source_waveform_parallel*
- *create_source_waveform_serial*
- *create_time_set*
- *delete_all_time_sets*
- *disable_sites*
- *enable_sites*
- *fetch_capture_waveform*
- *fetch_history_ram_cycle_information*
- *frequency_counter_measure_frequency*
- *get_channel_names*
- *get_fail_count*
- *get_history_ram_sample_count*
- *get_pattern_pin_names*
- *get_pin_results_pin_information*
- *get_site_pass_fail*
- *get_time_set_drive_format*
- *get_time_set_edge*
- *get_time_set_edge_multiplier*
- *get_time_set_period*
- *initiate*
- *is_done*
- *is_site_enabled*
- *load_pattern*
- *load_pin_map*
- *load_specifications_levels_and_timing*
- *lock*
- *ppmu_measure*
- *ppmu_source*
- *read_sequencer_flag*
- *read_sequencer_register*
- *read_static*
- *reset*
- *reset_device*

- *self_calibrate*
- *self_test*
- *send_software_edge_trigger*
- *tdr*
- *unload_all_patterns*
- *unload_specifications*
- *unlock*
- *wait_until_done*
- *write_sequencer_flag*
- *write_sequencer_register*
- *write_source_waveform_broadcast*
- *write_source_waveform_data_from_file_tdms*
- *write_source_waveform_site_unique*
- *write_static*
- *Properties*
 - *active_load_ioh*
 - *active_load_iol*
 - *active_load_vcom*
 - *cache*
 - *channel_count*
 - *clock_generator_frequency*
 - *clock_generator_is_running*
 - *conditional_jump_trigger_terminal_name*
 - *conditional_jump_trigger_type*
 - *cycle_number_history_ram_trigger_cycle_number*
 - *digital_edge_conditional_jump_trigger_edge*
 - *digital_edge_conditional_jump_trigger_source*
 - *digital_edge_rio_trigger_edge*
 - *digital_edge_rio_trigger_source*
 - *digital_edge_start_trigger_edge*
 - *digital_edge_start_trigger_source*
 - *driver_setup*
 - *exported_conditional_jump_trigger_output_terminal*
 - *exported_pattern_opcode_event_output_terminal*
 - *exported_rio_event_output_terminal*

- *exported_start_trigger_output_terminal*
- *frequency_counter_hysteresis_enabled*
- *frequency_counter_measurement_mode*
- *frequency_counter_measurement_time*
- *group_capabilities*
- *halt_on_keep_alive_opcode*
- *history_ram_buffer_size_per_site*
- *history_ram_cycles_to_acquire*
- *history_ram_max_samples_to_acquire_per_site*
- *history_ram_number_of_samples_is_finite*
- *history_ram_pretrigger_samples*
- *history_ram_trigger_type*
- *instrument_firmware_revision*
- *instrument_manufacturer*
- *instrument_model*
- *interchange_check*
- *io_resource_descriptor*
- *is_keep_alive_active*
- *logical_name*
- *mask_compare*
- *pattern_label_history_ram_trigger_cycle_offset*
- *pattern_label_history_ram_trigger_label*
- *pattern_label_history_ram_trigger_vector_offset*
- *pattern_opcode_event_terminal_name*
- *ppmu_allow_extended_voltage_range*
- *ppmu_aperture_time*
- *ppmu_aperture_time_units*
- *ppmu_current_level*
- *ppmu_current_level_range*
- *ppmu_current_limit*
- *ppmu_current_limit_behavior*
- *ppmu_current_limit_range*
- *ppmu_current_limit_supported*
- *ppmu_output_function*
- *ppmu_voltage_level*

- *ppmu_voltage_limit_high*
 - *ppmu_voltage_limit_low*
 - *query_instrument_status*
 - *range_check*
 - *record_coercions*
 - *rio_event_terminal_name*
 - *rio_trigger_terminal_name*
 - *rio_trigger_type*
 - *selected_function*
 - *sequencer_flag_terminal_name*
 - *serial_number*
 - *simulate*
 - *specific_driver_class_spec_major_version*
 - *specific_driver_class_spec_minor_version*
 - *specific_driver_description*
 - *specific_driver_prefix*
 - *specific_driver_revision*
 - *specific_driver_vendor*
 - *start_label*
 - *start_trigger_terminal_name*
 - *start_trigger_type*
 - *supported_instrument_models*
 - *tdr_endpoint_termination*
 - *tdr_offset*
 - *termination_mode*
 - *timing_absolute_delay*
 - *timing_absolute_delay_enabled*
 - *vih*
 - *vil*
 - *voh*
 - *vol*
 - *vterm*
- *NI-TClk Support*

Repeated Capabilities

Repeated capabilities attributes are used to set the *channel_string* parameter to the underlying driver function call. This can be the actual function based on the Session method being called, or it can be the appropriate Get/Set Attribute function, such as `niDigital_SetAttributeViInt32()`.

Repeated capabilities attributes use the indexing operator `[]` to indicate the repeated capabilities. The parameter can be a string, list, tuple, or slice (range). Each element of those can be a string or an integer. If it is a string, you can indicate a range using the same format as the driver: `'0-2'` or `'0:2'`

Some repeated capabilities use a prefix before the number and this is optional

channels

`nidigital.Session.channels`

```
session.channels['0-2'].channel_enabled = True
```

passes a string of `'0, 1, 2'` to the set attribute function.

pins

`nidigital.Session.pins`

```
session.pins['0-2'].channel_enabled = True
```

passes a string of `'0, 1, 2'` to the set attribute function.

instruments

`nidigital.Session.instruments`

```
session.instruments['0-2'].channel_enabled = True
```

passes a string of `'0, 1, 2'` to the set attribute function.

pattern_opcode_events

`nidigital.Session.pattern_opcode_events`

If no prefix is added to the items in the parameter, the correct prefix will be added when the driver function call is made.

```
session.pattern_opcode_events['0-2'].channel_enabled = True
```

passes a string of `'patternOpcodeEvent0, patternOpcodeEvent1, patternOpcodeEvent2'` to the set attribute function.

If an invalid repeated capability is passed to the driver, the driver will return an error.

You can also explicitly use the prefix as part of the parameter, but it must be the correct prefix for the specific repeated capability.

```
session.pattern_opcode_events['patternOpcodeEvent0-patternOpcodeEvent2'].  
    ↪channel_enabled = True
```

passes a string of 'patternOpcodeEvent0, patternOpcodeEvent1, patternOpcodeEvent2' to the set attribute function.

conditional_jump_triggers

`nidigital.Session.conditional_jump_triggers`

If no prefix is added to the items in the parameter, the correct prefix will be added when the driver function call is made.

```
session.conditional_jump_triggers['0-2'].channel_enabled = True
```

passes a string of 'conditionalJumpTrigger0, conditionalJumpTrigger1, conditionalJumpTrigger2' to the set attribute function.

If an invalid repeated capability is passed to the driver, the driver will return an error.

You can also explicitly use the prefix as part of the parameter, but it must be the correct prefix for the specific repeated capability.

```
session.conditional_jump_triggers['conditionalJumpTrigger0-  
    ↪conditionalJumpTrigger2'].channel_enabled = True
```

passes a string of 'conditionalJumpTrigger0, conditionalJumpTrigger1, conditionalJumpTrigger2' to the set attribute function.

sites

`nidigital.Session.sites`

If no prefix is added to the items in the parameter, the correct prefix will be added when the driver function call is made.

```
session.sites['0-2'].channel_enabled = True
```

passes a string of 'site0, site1, site2' to the set attribute function.

If an invalid repeated capability is passed to the driver, the driver will return an error.

You can also explicitly use the prefix as part of the parameter, but it must be the correct prefix for the specific repeated capability.

```
session.sites['site0-site2'].channel_enabled = True
```

passes a string of 'site0, site1, site2' to the set attribute function.

rio_events

nidigital.Session.rio_events

If no prefix is added to the items in the parameter, the correct prefix will be added when the driver function call is made.

```
session.rio_events['0-2'].channel_enabled = True
```

passes a string of 'RIOEvent0, RIOEvent1, RIOEvent2' to the set attribute function.

If an invalid repeated capability is passed to the driver, the driver will return an error.

You can also explicitly use the prefix as part of the parameter, but it must be the correct prefix for the specific repeated capability.

```
session.rio_events['RIOEvent0-RIOEvent2'].channel_enabled = True
```

passes a string of 'RIOEvent0, RIOEvent1, RIOEvent2' to the set attribute function.

rio_triggers

nidigital.Session.rio_triggers

If no prefix is added to the items in the parameter, the correct prefix will be added when the driver function call is made.

```
session.rio_triggers['0-2'].channel_enabled = True
```

passes a string of 'RIOTrigger0, RIOTrigger1, RIOTrigger2' to the set attribute function.

If an invalid repeated capability is passed to the driver, the driver will return an error.

You can also explicitly use the prefix as part of the parameter, but it must be the correct prefix for the specific repeated capability.

```
session.rio_triggers['RIOTrigger0-RIOTrigger2'].channel_enabled = True
```

passes a string of 'RIOTrigger0, RIOTrigger1, RIOTrigger2' to the set attribute function.

Enums

Enums used in NI-Digital Pattern Driver

BitOrder

class nidigital.BitOrder

MSB

The most significant bit is first. The first bit is in the 2^n place, where n is the number of bits.

LSB

The least significant bit is first. The first bit is in the 2^0 place.

DigitalEdge

class nidigital.DigitalEdge

RISING

Asserts the trigger when the signal transitions from low level to high level.

FALLING

Asserts the trigger when the signal transitions from high level to low level.

DriveFormat

class nidigital.DriveFormat

NR

Drive format remains at logic level after each bit.

RL

Drive format returns to a logic level low after each bit.

RH

Drive format returns to a logic level high after each bit.

SBC

Drive format returns to the complement logic level of the bit after each bit.

FrequencyMeasurementMode

class nidigital.FrequencyMeasurementMode

BANKED

Frequency measurements are made serially for groups of channels associated with a single frequency counter for each group.

Maximum frequency measured: 200 MHz.

PARALLEL

Frequency measurements are made by multiple frequency counters in parallel.

Maximum frequency measured: 100 MHz.

HistoryRAMCyclesToAcquire

class nidigital.HistoryRAMCyclesToAcquire

FAILED

Acquires failed cycles.

ALL

Acquires all cycles.

HistoryRAMTriggerType

```
class nidigital.HistoryRAMTriggerType
```

FIRST_FAILURE

First Failure History RAM trigger

CYCLE_NUMBER

Cycle Number History RAM trigger.

PATTERN_LABEL

Pattern Label History RAM trigger

PPMUAptertureTimeUnits

```
class nidigital.PPMUAptertureTimeUnits
```

SECONDS

Unit in seconds.

PPMUCurrentLimitBehavior

```
class nidigital.PPMUCurrentLimitBehavior
```

REGULATE

Controls output current so that it does not exceed the current limit. Power continues to generate even if the current limit is reached.

PPMUMeasurementType

```
class nidigital.PPMUMeasurementType
```

CURRENT

The PPMU measures current.

VOLTAGE

The PPMU measures voltage.

PPMUOutputFunction

```
class nidigital.PPMUOutputFunction
```

VOLTAGE

The PPMU forces voltage to the DUT.

CURRENT

The PPMU forces current to the DUT.

PinState

class `nidigital.PinState`

ZERO

A digital state of 0.

ONE

A digital state of 1.

L

A digital state of L (low).

H

A digital state of H (high).

X

A digital state of X (non-drive state).

M

A digital state of M (midband).

V

A digital state of V (compare high or low, not midband; store results from capture functionality if configured).

D

A digital state of D (drive data from source functionality if configured).

E

A digital state of E (compare data from source functionality if configured).

NOT_A_PIN_STATE

Not a pin state is used for non-existent DUT cycles.

PIN_STATE_NOT_ACQUIRED

Pin state could not be acquired because none of the pins mapped to the instrument in a multi-instrument session had any failures.

SelectedFunction

class `nidigital.SelectedFunction`

DIGITAL

The pattern sequencer controls the specified pin(s). If a pattern is currently bursting, the pin immediately switches to bursting the pattern. This option disconnects the PPMU.

PPMU

The PPMU controls the specified pin(s) and connects the PPMU. The pin driver is in a non-drive state, and the active load is disabled. The PPMU does not start sourcing or measuring until `Source` or `Measure(PpmuMeasurementType)` is called.

OFF

Puts the digital driver in a non-drive state, disables the active load, disconnects the PPMU, and closes the I/O switch connecting the instrument channel.

DISCONNECT

The I/O switch connecting the instrument channel is open to the I/O connector. If the PPMU is sourcing, it is stopped prior to opening the I/O switch.

RIO

Yields control of the specified pin(s) to LabVIEW FPGA.

SequencerFlag

```
class nidigital.SequencerFlag
```

FLAG0

FLAG1

FLAG2

FLAG3

SequencerRegister

```
class nidigital.SequencerRegister
```

REGISTER0

REGISTER1

REGISTER2

REGISTER3

REGISTER4

REGISTER5

REGISTER6

REGISTER7

REGISTER8

REGISTER9

REGISTER10

REGISTER11

REGISTER12

REGISTER13

REGISTER14

REGISTER15

SoftwareTrigger

class nidigital.**SoftwareTrigger**

START

Overrides the start trigger.

CONDITIONAL_JUMP

Specifies to route a conditional jump trigger.

SourceDataMapping

class nidigital.**SourceDataMapping**

BROADCAST

Broadcasts the waveform you specify to all sites.

SITE_UNIQUE

Sources unique waveform data to each site.

TDREndpointTermination

class nidigital.**TDREndpointTermination**

OPEN

TDR channels are connected to an open circuit.

SHORT_TO_GROUND

TDR channels are connected to a short to ground.

TerminationMode

class nidigital.**TerminationMode**

ACTIVE_LOAD

The active load provides a constant current to a commutating voltage (Vcom).

VTERM

The pin driver drives Vterm.

HIGH_Z

The pin driver is in a non-drive state (in a high-impedance state) and the active load is disabled.

TimeSetEdgeType

class nidigital.TimeSetEdgeType

DRIVE_ON

Specifies the drive on edge of the time set.

DRIVE_DATA

Specifies the drive data edge of the time set.

DRIVE_RETURN

Specifies the drive return edge of the time set.

DRIVE_OFF

Specifies the drive off edge of the time set.

COMPARE_STROBE

Specifies the compare strobe of the time set.

DRIVE_DATA2

Specifies the drive data 2 edge of the time set.

DRIVE_RETURN2

Specifies the drive return 2 edge of the time set.

COMPARE_STROBE2

Specifies the compare strobe 2 of the time set.

TriggerType

class nidigital.TriggerType

NONE

Disables the start trigger.

DIGITAL_EDGE

Digital edge trigger.

SOFTWARE

Software start trigger.

WriteStaticPinState

class nidigital.WriteStaticPinState

ZERO

Specifies to drive low.

ONE

Specifies to drive high.

X

Specifies to not drive.

Exceptions and Warnings

Error

exception `nidigital.errors.Error`

Base exception type that all NI-Digital Pattern Driver exceptions derive from

DriverError

exception `nidigital.errors.DriverError`

An error originating from the NI-Digital Pattern Driver driver

UnsupportedConfigurationError

exception `nidigital.errors.UnsupportedConfigurationError`

An error due to using this module in an unsupported platform.

DriverNotInstalledError

exception `nidigital.errors.DriverNotInstalledError`

An error due to using this module without the driver runtime installed.

DriverTooOldError

exception `nidigital.errors.DriverTooOldError`

An error due to using this module with an older version of the NI-Digital Pattern Driver driver runtime.

DriverTooNewError

exception `nidigital.errors.DriverTooNewError`

An error due to the NI-Digital Pattern Driver driver runtime being too new for this module.

InvalidRepeatedCapabilityError

exception `nidigital.errors.InvalidRepeatedCapabilityError`

An error due to an invalid character in a repeated capability

SelfTestError

exception `nidigital.errors.SelfTestError`

An error due to a failed self-test

RpcError

exception `nidigital.errors.RpcError`

An error specific to sessions to the NI gRPC Device Server

DriverWarning

exception `nidigital.errors.DriverWarning`

A warning originating from the NI-Digital Pattern Driver driver

Examples

You can download all `nidigital` examples [here](#)

`nidigital_burst_with_start_trigger.py`

Listing 1: (`nidigital_burst_with_start_trigger.py`)

```

1  #!/usr/bin/python
2
3  import argparse
4  import nidigital
5  import os
6  import sys
7
8
9  def example(resource_name, options, trigger_source=None, trigger_edge=None):
10
11     with nidigital.Session(resource_name=resource_name, options=options) as session:
12
13         dir = os.path.join(os.path.dirname(__file__))
14
15         # Load the pin map (.pinmap) created using the Digital Pattern Editor
16         pin_map_filename = os.path.join(dir, 'PinMap.pinmap')
17         session.load_pin_map(pin_map_filename)
18
19         # Load the specifications (.specs), levels (.digilevels), and timing (.
20 →digitiming) sheets created using the Digital Pattern Editor
21         spec_filename = os.path.join(dir, 'Specifications.specs')
22         levels_filename = os.path.join(dir, 'PinLevels.digilevels')
23         timing_filename = os.path.join(dir, 'Timing.digitiming')
24         session.load_specifications_levels_and_timing(spec_filename, levels_filename, →
25 →timing_filename)

```

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```

24
25     # Apply the settings from the levels and timing sheets we just loaded to the
↪ session
26     session.apply_levels_and_timing(levels_filename, timing_filename)
27
28     # Loading the pattern file (.digipat) created using the Digital Pattern Editor
29     pattern_filename = os.path.join(dir, 'Pattern.digipat')
30     session.load_pattern(pattern_filename)
31
32     if trigger_source is None:
33         print('Start bursting pattern')
34     else:
35         # Specify a source and edge for the external start trigger
36         session.start_trigger_type = nidigital.TriggerType.DIGITAL_EDGE
37         session.digital_edge_start_trigger_source = trigger_source
38         session.digital_edge_start_trigger_edge = nidigital.DigitalEdge.RISING if
↪ trigger_edge == 'Rising' else nidigital.DigitalEdge.FALLING
39         print('Wait for start trigger and then start bursting pattern')
40
41     # If start trigger is configured, waiting for the trigger to start bursting and
↪ then blocks until the pattern is done bursting
42     # Else just start bursting and block until the pattern is done bursting
43     session.burst_pattern(start_label='new_pattern')
44
45     # Disconnect all channels using programmable onboard switching
46     session.selected_function = nidigital.SelectedFunction.DISCONNECT
47     print('Done bursting pattern')
48
49
50 def _main(argv):
51     parser = argparse.ArgumentParser(description='Demonstrates how to create and
↪ configure a session that bursts a pattern on the digital pattern instrument using a
↪ start trigger', formatter_class=argparse.ArgumentDefaultsHelpFormatter)
52     parser.add_argument('-n', '--resource-name', default='PXI1Slot2,PXI1Slot3', help=
↪ 'Resource name of a NI digital pattern instrument. Ensure the resource name matches
↪ the instrument name in the pinmap file.')
53     parser.add_argument('-s', '--simulate', default='True', choices=['True', 'False'],
↪ help='Whether to run on simulated hardware or real hardware')
54     subparser = parser.add_subparsers(dest='command', help='Sub-command help')
55     start_trigger = subparser.add_parser('start-trigger', help='Configure start trigger')
56     start_trigger.add_argument('-ts', '--trigger-source', default='/PXI1Slot2/PXI-Trig0',
↪ help='Source terminal for the start trigger')
57     start_trigger.add_argument('-te', '--trigger-edge', default='Rising', choices=[
↪ 'Rising', 'Falling'], help='Trigger on rising edge or falling edge of start trigger')
58     args = parser.parse_args(argv)
59
60     example(args.resource_name,
61             'Simulate=1, DriverSetup=Model:6571' if args.simulate == 'True' else '',
62             args.trigger_source if args.command == 'start-trigger' else None,
63             args.trigger_edge if args.command == 'start-trigger' else None)
64
65

```

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```

66 def main():
67     _main(sys.argv[1:])
68
69
70 def test_main():
71     _main([])
72     _main(['start-trigger'])
73
74
75 def test_example():
76     resource_name = 'PXI1Slot2,PXI1Slot3'
77     options = {'simulate': True, 'driver_setup': {'Model': '6571'}, }
78     example(resource_name, options)
79
80     trigger_source = '/PXI1Slot2/PXI-Trig0'
81     trigger_edge = 'Rising'
82     example(resource_name, options, trigger_source, trigger_edge)
83
84
85 if __name__ == '__main__':
86     main()

```

nidigital_configure_time_set_and_voltage_levels.py

Listing 2: (nidigital_configure_time_set_and_voltage_levels.py)

```

1  #!/usr/bin/python
2
3  import argparse
4  import nidigital
5  import os
6  import sys
7
8
9  class VoltageLevelsAndTerminationConfig():
10     def __init__(self, vil, vih, vol, voh, vterm, termination_mode, iol, ioh, vcom):
11         self.vil = vil
12         self.vih = vih
13         self.vol = vol
14         self.voh = voh
15         self.vterm = vterm
16         self.termination_mode = termination_mode
17         self.iol = iol
18         self.ioh = ioh
19         self.vcom = vcom
20
21
22 class TimeSetConfig():
23     def __init__(self, time_set_name, period, drive_format, drive_on, drive_data, drive_
↪return, drive_off, strobe_edge):

```

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```

24     self.time_set_name = time_set_name
25     self.period = period
26     self.drive_format = drive_format
27     self.drive_on = drive_on
28     self.drive_data = drive_data
29     self.drive_return = drive_return
30     self.drive_off = drive_off
31     self.strobe_edge = strobe_edge
32
33
34 def convert_drive_format(drive_format):
35     converter = {'NR': nidigital.DriveFormat.NR,
36                 'RL': nidigital.DriveFormat.RL,
37                 'RH': nidigital.DriveFormat.RH,
38                 'SBC': nidigital.DriveFormat.SBC}
39     return converter.get(drive_format, None)
40
41
42 def example(resource_name,
43            options,
44            channels,
45            voltage_config,
46            time_set_config):
47
48     with nidigital.Session(resource_name=resource_name, options=options) as session:
49
50         dir = os.path.dirname(__file__)
51
52         # Load pin map (.pinmap) created using Digital Pattern Editor
53         pin_map_filename = os.path.join(dir, 'PinMap.pinmap')
54         session.load_pin_map(pin_map_filename)
55
56         # Configure voltage levels and terminal voltage through driver API
57         session.channels[channels].configure_voltage_levels(voltage_config.vil, voltage_
↪ config.vih, voltage_config.vol, voltage_config.voh, voltage_config.vterm)
58         if voltage_config.termination_mode == 'High_Z':
59             session.channels[channels].termination_mode = nidigital.TerminationMode.HIGH_
↪ Z
60         elif voltage_config.termination_mode == 'Active_Load':
61             session.channels[channels].termination_mode = nidigital.TerminationMode.
↪ ACTIVE_LOAD
62             session.channels[channels].configure_active_load_levels(voltage_config.iol,
↪ voltage_config.ioh, voltage_config.vcom)
63         else:
64             session.channels[channels].termination_mode = nidigital.TerminationMode.VTERM
65
66         # Configure time set through driver API
67         session.create_time_set(time_set_config.time_set_name) # Must match time set
↪ name in pattern file
68         session.configure_time_set_period(time_set_config.time_set_name, time_set_config.
↪ period)
69         session.channels[channels].configure_time_set_drive_edges(time_set_config.time_

```

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```

70 ↪set_name, convert_drive_format(time_set_config.drive_format),
time_set_config.drive_
71 ↪on, time_set_config.drive_data,
time_set_config.drive_
72 ↪return, time_set_config.drive_off)
session.channels[channels].configure_time_set_compare_edges_strobe(time_set_
73 ↪config.time_set_name, time_set_config.strobe_edge)
74
75 # Load the pattern file (.digipat) created using Digital Pattern Editor
pattern_filename = os.path.join(dir, 'Pattern.digipat')
76 session.load_pattern(pattern_filename)
77
78 # Burst pattern, blocks until the pattern is done bursting
79 session.burst_pattern(start_label='new_pattern')
80 print('Start bursting pattern')
81
82 # Disconnect all channels using programmable onboard switching
83 session.selected_function = nidigital.SelectedFunction.DISCONNECT
84 print('Done bursting pattern')
85
86
87 def _main(argv):
88     parser = argparse.ArgumentParser(description='Demonstrates how to create an
89 ↪instrument session, configure time set and voltage levels, and burst a pattern on the
90 ↪digital pattern instrument.', formatter_class=argparse.ArgumentDefaultsHelpFormatter)
91     parser.add_argument('-n', '--resource-name', default='PXI1Slot2,PXI1Slot3', help=
92 ↪'Resource name of a NI digital pattern instrument, ensure the resource name matches
93 ↪the instrument name in the pinmap file.')
94     parser.add_argument('-s', '--simulate', default='True', choices=['True', 'False'],
95 ↪help='Whether to run on simulated hardware or on real hardware')
96     parser.add_argument('-c', '--channels', default='PinGroup1', help='Channel(s)/Pin(s)
97 ↪to configure')
98
99     # Parameters to configure voltage
100     parser.add_argument('--vil', default=0, type=float, help='The voltage that the
101 ↪instrument will apply to the input of the DUT when the pin driver drives a logic low
102 ↪(0)')
103     parser.add_argument('--vih', default=3.3, type=float, help='The voltage that the
104 ↪instrument will apply to the input of the DUT when the test instrument drives a logic
105 ↪high (1)')
106     parser.add_argument('--vol', default=1.6, type=float, help='The output voltage below
107 ↪which the comparator on the pin driver interprets a logic low (L)')
108     parser.add_argument('--voh', default=1.7, type=float, help='The output voltage above
109 ↪which the comparator on the pin driver interprets a logic high (H)')
110     parser.add_argument('--vterm', default=2, type=float, help='The termination voltage
111 ↪the instrument applies during non-drive cycles when the termination mode is set to
112 ↪Vterm')
113     parser.add_argument('-term-mode', '--termination-mode', default='High_Z', choices=[
114 ↪'High_Z', 'Active_Load', 'Three_Level_Drive'])
115     parser.add_argument('--iol', default=0.002, type=float, help='The maximum current
116 ↪that the DUT sinks while outputting a voltage below VCOM')
117     parser.add_argument('--ioh', default=-0.002, type=float, help='The maximum current

```

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```

102     ↪ that the DUT sources while outputting a voltage above VCOM')
103     parser.add_argument('--vcom', default=0.0, type=float, help='The commutating voltage_
104     ↪ level at which the active load circuit switches between sourcing current and sinking_
105     ↪ current')
106
107     # Parameters to configure timeset
108     parser.add_argument('--period', default=0.00000002, type=float, help='Period in_
109     ↪ second')
110     parser.add_argument('-format', '--drive-format', default='NR', choices=['NR', 'RL',
111     ↪ 'RH', 'SBC'], help='Non-return | Return to low | Return to high | Surround by_
112     ↪ complement')
113     parser.add_argument('--drive-on', default=0, type=float, help='The delay in seconds_
114     ↪ from the beginning of the vector period for turning on the pin driver')
115     parser.add_argument('--drive-data', default=0, type=float, help='The delay in_
116     ↪ seconds from the beginning of the vector period until the pattern data is driven to_
117     ↪ the pattern value')
118     parser.add_argument('--drive-return', default=0.000000015, type=float, help='The_
119     ↪ delay in seconds from the beginning of the vector period until the pin changes from_
120     ↪ the pattern data to the return value, as specified in the format.')
121     parser.add_argument('--drive-off', default=0.00000002, type=float, help='The delay_
122     ↪ in seconds from the beginning of the vector period to turn off the pin driver when the_
123     ↪ next vector period uses a non-drive symbol (L, H, X, V, M, E).')
124     parser.add_argument('--strobe-edge', default=0.00000001, type=float, help='The time_
125     ↪ in second when the comparison happens within a vector period')
126
127     args = parser.parse_args(argv)
128     voltage_config = VoltageLevelsAndTerminationConfig(args.vil, args.vih, args.vol,
129     ↪ args.voh, args.vterm, args.termination_mode, args.iol, args.ioh, args.vcom)
130     time_set_config = TimeSetConfig("tset0", args.period, args.drive_format, args.drive_
131     ↪ on, args.drive_data, args.drive_return, args.drive_off, args.strobe_edge)
132     example(args.resource_name,
133             'Simulate=1, DriverSetup=Model:6571' if args.simulate == 'True' else '',
134             args.channels,
135             voltage_config,
136             time_set_config)
137
138 def main():
139     _main(sys.argv[1:])
140
141 def test_main():
142     _main([])
143
144 def test_example():
145     resource_name = 'PXI1Slot2,PXI1Slot3'
146     options = {'simulate': True, 'driver_setup': {'Model': '6571'}, }
147     channels = 'PinGroup1'
148     voltage_config = VoltageLevelsAndTerminationConfig(vil=0, vih=3.3, vol=1.6, voh=1.7,
149     ↪ vterm=2,
150
151                                     termination_mode='Active_Load',

```

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```

137     ↪ iol=0.002, ioh=-0.002, vcom=0)
138         time_set_config = TimeSetConfig(time_set_name="tset0",
139                                         period=0.00000002,
140                                         drive_format='NR',
141                                         drive_on=0, drive_data=0, drive_return=0.000000015, ↪
142     ↪ drive_off=0.00000002, strobe_edge=0.00000001)
143         example(resource_name, options, channels, voltage_config, time_set_config)
144
145 if __name__ == '__main__':
146     main()

```

nidigital_ppmu_source_and_measure.py

Listing 3: (nidigital_ppmu_source_and_measure.py)

```

1  #!/usr/bin/python
2
3  import argparse
4  import nidigital
5  import os
6  import pytest
7  import sys
8  import time
9
10
11 def example(resource_name, options, channels, measure, aperture_time,
12            source=None, settling_time=None, current_level_range=None, current_
13            ↪ level=None,
14            voltage_limit_high=None, voltage_limit_low=None, current_limit_range=None, ↪
15            ↪ voltage_level=None):
16
17     with nidigital.Session(resource_name=resource_name, options=options) as session:
18
19         dir = os.path.join(os.path.dirname(__file__))
20
21         # Load pin map (.pinmap) created using Digital Pattern Editor
22         pin_map_filename = os.path.join(dir, 'PinMap.pinmap')
23         session.load_pin_map(pin_map_filename)
24
25         # Configure the PPMU measurement aperture time
26         session.channels[channels].ppmu_aperture_time = aperture_time
27         session.channels[channels].ppmu_aperture_time_units = nidigital.
28         ↪ PPMUApertureTimeUnits.SECONDS
29
30         # Configure and source
31         if source == 'source-current':
32             session.channels[channels].ppmu_output_function = nidigital.
33             ↪ PPMUOutputFunction.CURRENT

```

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```

31     session.channels[channels].ppmu_current_level_range = current_level_range
32     session.channels[channels].ppmu_current_level = current_level
33     session.channels[channels].ppmu_voltage_limit_high = voltage_limit_high
34     session.channels[channels].ppmu_voltage_limit_low = voltage_limit_low
35
36     session.channels[channels].ppmu_source()
37
38     # Settling time between sourcing and measuring
39     time.sleep(settling_time)
40
41     elif source == 'source-voltage':
42         session.channels[channels].ppmu_output_function = nidigital.
↳ PPMUOutputFunction.VOLTAGE
43
44         session.channels[channels].ppmu_current_limit_range = current_limit_range
45         session.channels[channels].ppmu_voltage_level = voltage_level
46
47         session.channels[channels].ppmu_source()
48
49         # Settling time between sourcing and measuring
50         time.sleep(settling_time)
51
52     pin_info = session.channels[channels].get_pin_results_pin_information()
53
54     # Measure
55     if measure == 'current':
56         current_measurements = session.channels[channels].ppmu_measure(nidigital.
↳ PPMUMeasurementType.CURRENT)
57
58         print('{:<6} {:<20} {:<10}'.format('Site', 'Pin Name', 'Current'))
59
60         for pin, current in zip(pin_info, current_measurements):
61             print(f'{pin.site_number:<6d} {pin.pin_name:<20} {current:<10f}')
62     else:
63         voltage_measurements = session.channels[channels].ppmu_measure(nidigital.
↳ PPMUMeasurementType.VOLTAGE)
64
65         print('{:<6} {:<20} {:<10}'.format('Site', 'Pin Name', 'Voltage'))
66
67         for pin, voltage in zip(pin_info, voltage_measurements):
68             print(f'{pin.site_number:<6d} {pin.pin_name:<20} {voltage:<10f}')
69
70     # Disconnect all channels using programmable onboard switching
71     session.channels[channels].selected_function = nidigital.SelectedFunction.
↳ DISCONNECT
72
73
74 def _main(argv):
75     parser = argparse.ArgumentParser(description='Demonstrates how to source/measure_
↳ voltage/current using the PPMU on selected channels/pins of the digital pattern_
↳ instrument',
76                                     formatter_class=argparse.

```

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```

↪ArgumentDefaultsHelpFormatter)
77     parser.add_argument('-n', '--resource-name', default='PXI1Slot2,PXI1Slot3', help=
↪'Resource name of a NI digital pattern instrument, ensure the resource name matches,
↪the instrument name in the pinmap file.')
78     parser.add_argument('-s', '--simulate', default='True', choices=['True', 'False'],
↪help='Whether to run on simulated hardware or on real hardware')
79     parser.add_argument('-c', '--channels', default='DUTPin1, SystemPin1', help=
↪'Channel(s)/Pin(s) to use')
80     parser.add_argument('-m', '--measure', default='voltage', choices=['voltage',
↪'current'], help='Measure voltage or measure current')
81     parser.add_argument('-at', '--aperture-time', default=0.000004, type=float, help=
↪'Aperture time in seconds')
82     subparser = parser.add_subparsers(dest='source', help='Sub-command help, by default,
↪it measures voltage and does not source')
83
84     source_current = subparser.add_parser('source-current', help='Source current')
85     source_current.add_argument('-clr', '--current-level-range', default=0.000002,
↪type=float, help='Current level range in amps')
86     source_current.add_argument('-cl', '--current-level', default=0.000002, type=float,
↪help='Current level in amps')
87     source_current.add_argument('-vlh', '--voltage-limit-high', default=3.3, type=float,
↪help='Voltage limit high in volts')
88     source_current.add_argument('-vll', '--voltage-limit-low', default=0, type=float,
↪help='Voltage limit low in volts')
89     source_current.add_argument('-st', '--settling-time', default=0.01, type=float, help=
↪'Settling time in seconds')
90
91     source_voltage = subparser.add_parser('source-voltage', help='Source voltage')
92     source_voltage.add_argument('-clr', '--current-limit-range', default=0.000002,
↪type=float, help='Current limit range in amps')
93     source_voltage.add_argument('-vl', '--voltage-level', default=3.3, type=float, help=
↪'Voltage level in volts')
94     source_voltage.add_argument('-st', '--settling-time', default=0.01, type=float, help=
↪'Settling time in seconds')
95
96     args = parser.parse_args(argv)
97
98     if args.source == 'source-current':
99         example(
100             args.resource_name,
101             'Simulate=1, DriverSetup=Model:6571' if args.simulate == 'True' else '',
102             args.channels,
103             args.measure,
104             args.aperture_time,
105             args.source,
106             args.settling_time,
107             args.current_level_range,
108             args.current_level,
109             args.voltage_limit_high,
110             args.voltage_limit_low)
111     elif args.source == 'source-voltage':
112         example(

```

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```

113         args.resource_name,
114         'Simulate=1, DriverSetup=Model:6571' if args.simulate == 'True' else '',
115         args.channels,
116         args.measure,
117         args.aperture_time,
118         args.source,
119         args.settling_time,
120         current_limit_range=args.current_limit_range,
121         voltage_level=args.voltage_level)
122     else:
123         if args.measure == 'current':
124             raise ValueError('Cannot measure current on a channel that is not sourcing_
125 ↪voltage or current')
126         example(
127             args.resource_name,
128             'Simulate=1, DriverSetup=Model:6571' if args.simulate == 'True' else '',
129             args.channels,
130             args.measure,
131             args.aperture_time)
132
133 def main():
134     _main(sys.argv[1:])
135
136
137 def test_main():
138     _main([])
139     _main(['-m', 'voltage'])
140     with pytest.raises(Exception):
141         _main(['-m', 'current'])
142     _main(['-m', 'voltage', 'source-current'])
143     _main(['-m', 'current', 'source-current'])
144     _main(['-m', 'voltage', 'source-voltage'])
145     _main(['-m', 'current', 'source-voltage'])
146
147
148 def test_example():
149     resource_name = 'PXI1Slot2,PXI1Slot3'
150     options = {'simulate': True, 'driver_setup': {'Model': '6571'}, }
151     channels = 'DUTPin1, SystemPin1'
152     aperture_time = 0.000004
153
154     example(resource_name, options, channels, 'voltage',
155             aperture_time)
156     with pytest.raises(Exception):
157         example(resource_name, options, channels, 'current',
158             aperture_time)
159
160     settling_time = 0.01
161     current_level_range = 0.000002
162     current_level = 0.000002
163     voltage_limit_high = 3.3

```

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```

164 voltage_limit_low = 0
165 example(resource_name, options, channels, 'voltage',
166         aperture_time, 'source-current', settling_time,
167         current_level_range, current_level,
168         voltage_limit_high, voltage_limit_low)
169 example(resource_name, options, channels, 'current',
170         aperture_time, 'source-current', settling_time,
171         current_level_range, current_level,
172         voltage_limit_high, voltage_limit_low)
173
174 current_limit_range = 0.000002
175 voltage_level = 3.3
176 example(resource_name, options, channels, 'voltage',
177         aperture_time, 'source-voltage', settling_time,
178         current_limit_range=current_limit_range,
179         voltage_level=voltage_level)
180 example(resource_name, options, channels, 'current',
181         aperture_time, 'source-voltage', settling_time,
182         current_limit_range=current_limit_range,
183         voltage_level=voltage_level)
184
185
186 if __name__ == '__main__':
187     main()

```

gRPC Support

Support for using NI-Digital Pattern Driver over gRPC

SessionInitializationBehavior

class nidigital.SessionInitializationBehavior

AUTO

The NI gRPC Device Server will attach to an existing session with the specified name if it exists, otherwise the server will initialize a new session.

Note: When using the Session as a context manager and the context exits, the behavior depends on what happened when the constructor was called. If it resulted in a new session being initialized on the NI gRPC Device Server, then it will automatically close the server session. If it instead attached to an existing session, then it will detach from the server session and leave it open.

INITIALIZE_SERVER_SESSION

Require the NI gRPC Device Server to initialize a new session with the specified name.

Note: When using the Session as a context manager and the context exits, it will automatically close the server session.

ATTACH_TO_SERVER_SESSION

Require the NI gRPC Device Server to attach to an existing session with the specified name.

Note: When using the Session as a context manager and the context exits, it will detach from the server session and leave it open.

GrpcSessionOptions

```
class nidigital.GrpcSessionOptions(self, grpc_channel, session_name,
                                   initialization_behavior=SessionInitializationBehavior.AUTO)
```

Collection of options that specifies session behaviors related to gRPC.

Creates and returns an object you can pass to a Session constructor.

Parameters

- **grpc_channel** (*grpc.Channel*) – Specifies the channel to the NI gRPC Device Server.
- **session_name** (*str*) – User-specified name that identifies the driver session on the NI gRPC Device Server.

This is different from the resource name parameter many APIs take as a separate parameter. Specifying a name makes it easy to share sessions across multiple gRPC clients. You can use an empty string if you want to always initialize a new session on the server. To attach to an existing session, you must specify the session name it was initialized with.

- **initialization_behavior** (*nidigital.SessionInitializationBehavior*) – Specifies whether it is acceptable to initialize a new session or attach to an existing one, or if only one of the behaviors is desired.

The driver session exists on the NI gRPC Device Server.

4.2 Additional Documentation

Refer to your driver documentation for device-specific information and detailed API documentation.

Refer to the [nimi-python Read the Docs project](#) for documentation of versions 1.4.4 of the module or earlier.

LICENSE

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gRPC Features

For driver APIs that support it, passing a `GrpcSessionOptions` instance as a parameter to `Session.__init__()` is subject to the NI General Purpose EULA (see [NILICENSE](#)).

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