# **Inovo API**

# version

Inovo

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## Welcome to Inovo API's documentation!

#### **Inovo API**

#### Submodules

## gripper\_client

class commander\_api.gripper\_client.GripperClient (ns='default')
Class to controll gripper connected to the robot

Parameters: ns (string, optional) - namespace, to define the name of the gripper, defaults to 'default'

activate()

Activate the gripper before moving it

Raises: Exception – Gripper activation error

get\_position()

Return current position of the gripper

Returns: gripper position

Return type: float

get\_state()

Return information about activation state of the gripper

**Returns:** activated **Return type:** bool

move (target\_position, effort)

Move the gripper to the given goal, locks till target is reached or gripper is stalled

Parameters:

• target\_position (float) - the desired position of the gripper, from 0 to 1

• effort (float) - the effort used to move the fingers, from 0 to 1

Raises: Exception – Gripper action error

**Returns:** True if the target position is not reached, False if the target is reached

Return type: Bool

## io\_client

class commander\_api.io\_client.IOClient

Class used to control the digital input/output on the robot writst and PSU box

psu\_analog\_read (channel)

Get the value of the PSU analog input

Parameters: channel (int) – channel to read

Returns: Analog input value

Return type: float

psu\_analog\_write (channel, value)

Write to the PSU analog output

#### Parameters:

- channel (int) channel to write
- value (float) output value

#### psu\_digital\_read (channel)

Get the value of the PSU digital input

Parameters: channel (int) – channel to read

Raises: Exception – [description]
Returns: value read by the PSU

Return type: int

### psu\_digital\_write (channel, value)

Write to the PSU digital output

Parameters:

- channel (int) channel to write
- value (int) output value

Raises: Exception – PSU digital write error

#### wrist\_digital\_read (channel)

Get the read of the wrist digital input

Parameters: channel (int) – channel to read

Raises: Exception – Wrist digital read error

Returns: value read by the wrist

Return type: int

#### wrist\_digital\_write (channel, value)

Write to the wrist digital output

Parameters:

- channel (int) channel to write
- value (int) output value

Raises: Exception – Wrist digital write error

## motion control client

class commander\_api.motion\_control\_client.MotionControlClient
Class used to send motion commands to the robot

#### get\_joint\_angles ()

Get the current joint positions

Raises: Exception – Failed to get the joint angles

Returns: Joint positions (rad)

Return type: list(float)

#### get\_tcp\_pose()

Get the current position of the tcp in base frame

Returns: tcp position

Return type: TransformFrame

#### movej (target, spd=0.25, acc=0.5)

Joint move to a cartesian target, locks till the target is reached

Parameters:

- target (*TransformFrame*) target position x, y, z in meters and rotation rx, ry, rz in radians
- spd (float, optional) Tool speed in m/s, defaults to 0.25
- acc (float, optional) Tool acceleration in m/s/s, defaults to 0.5

Raises: RuntimeError - Unable to execute the move

movej\_angle (joint\_angles, joint\_velocity=0.4, joint\_acceleration=0.75)

Move to a joint space target, locks till the target is reached

Parameters:

- joint\_angles (list(float)) joint angles in radians
- joint\_velocity (float, optional) maximum joint velocity in rad/s, defaults to 0.4
- joint\_acceleration (float, optional) maximum joint acceleration in rad/s/s, defaults to 0.75

Raises: RuntimeError - Unable to execute the move

movel (target, spd=0.25, acc=0.5)

Linear move to a cartesian target, locks till the target is reached

Parameters:

- target (*TransformFrame*) target position x, y, z in meters and rotation rx, ry, rz in radians
- spd (float, optional) Tool speed in m/s, defaults to 0.25
- acc (float, optional) Tool acceleration in m/s/s, defaults to 0.5

Raises: RuntimeError – Unable to execute the move

### psu\_client

```
class commander_api.psu_client.PSUClient
  Class used to control the PSU box
  get_bus_current()
    Get the current of the bus
           Returns: bus current
        Return type:
                      float
  get_bus_state()
    Get the bus power status
             Raises:
                      Exception – Unknown psu state
           Returns:
                      state, bus on = 1, bus off = 0
        Return type:
  get_bus_voltage()
    Get the voltage of the bus
           Returns:
                      bus voltage
        Return type:
                      float
  power_off()
    Robot bus power off
             Raises:
                     Exception – Error powering off the robot
```

power\_on()

Robot bus power on

Raises: Exception – Error powering on the robot

shut\_down ()
Turn off the PSU

## robot client

class commander\_api.robot\_client.RobotClient Robot client class used for basic controll of the robot functionality clear\_errors() Clear all errors Raises: Exception - Failed to clear errors disable () Disable the robot Raises: Exception - Failed to disable the robot enable () Enable the robot when it is powered on Exception - Failed to enable the robot Raises: get\_errors () Print the latest error message

Error message

# Return type: ErrorMessage

sequencer\_client

Returns:

class commander api.sequencer client.SequencerClient Class to control the sequencer get\_sequencer\_state() Get the current state of the sequencer Sequencer state, Idle = 0, Running = 1, Paused = 2 Returns: Return type: load\_project (name) Load an existing project Parameters: name (string) - project name Raises: **Exception** – Sequence failed to load a project pause () Pause the running sequence **Exception** – Sequence failed to pause Raises: start (name=", variable\_names=[], variable\_values=[]) Start the sequence or function

#### Parameters:

- name (str, optional) function name, defaults to the start block
- variable\_names (list, optional) arguments to pass in the function, defaults to []
- variable\_values (list, optional) values of the arguments passed to the function, defaults to []

Raises: Exception – Sequencer failed to start

#### stop()

Stop the running sequence

Raises: Exception – Sequence failed to stop

## **Datatypes**

```
class commander_api.custom_datatypes.ErrorMessage
Error message class with error code, source and message attributes
```

```
class commander_api.custom_datatypes.TransformFrame
Transform frame class with x,y,z position and rx, ry,rz rotation atributes
```

```
from_quaternion (q1, q2, q3, q4)
```

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