# **CONNECTING**

MATLAB acts as a server and Kerbal will only attempt to connect

to the server once when the craft is loaded. For this reason,

Matlab must be started and left "hanging" before the craft is

loaded.

Default IP: 127.0.0.1

Default Port: 25001

# **Commad IDs**

## Sending commands

Each command ID is a one byte number sent by MATLAB to KSP either providing complete instruction or giving context to subsequent instruction. Each command ID to KSP will also have a return byte sent by KSP to MATLAB. This return byte is sent before other returns and one is always sent.

## FRames of Reference

Body Frame – Attached to the vessel.

RCI – Reference body centered inertial.

RCRF – Reference body centered and reference body fixed.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ID Number | Function | Return Description | | | Additional Inputs | | |
| 15 | Get Gyro Rates | Float Vector 3 | Rad/s | [x, y, z] in body frame | N/A | N/A | N/A |
| 16 | Get Position | Double Vector 3 | m | [x, y, z] in RCI frame | N/A | N/A | N/A |
| 17 | Get Velocity | Double Vector 3 | m/s | [x, y, z] in RCI frame | N/A | N/A | N/A |
| 18 | Get Surface Quaternion | Float Quaternion | Unit | [w, x, y, z] frame rotation from RCRF to body frame | N/A | N/A | N/A |
| 19 | Get Euler Angles | Float Vector 3 | Rad | [x, y, z] N/D frame | N/A | N/A | N/A |
| 20 | Get Angular Velocity | N/A | N/A | N/A | N/A | N/A | N/A |
| 21 | Get Mission Time | Double | s | Current mission time | N/A | N/A | N/A |
| 22 | Get Rigid Body Position | Float Vector 3 | N/D | [x, y, z] N/D frame | N/A | N/A | N/A |
| 23 | Get Co-Orbiting Body Position | Double Vector 3 | m | [x, y, z] in RCI frame | Int32 | N/A | Co-Orbiting Body Index number (i.e. 1) |
| 24 | Get Vessel Mass | Float | Mg | Current vessel’s mass | N/A | N/A | N/A |
| 25 | Get Forward Vector | Float Vector 3 | Unit | Forward pointing vector of vessel in RCI frame. | N/A | N/A | N/A |
| 26 | Get Surface Velocity | Float Vector 3 | m/s | [x, y, z] in RCRF | N/A | N/A | N/A |
| 27 | Get Quaternions | Float Quaternion | Unit | [w, x, y, z] frame rotation from RCI to body frame | N/A | N/A | N/A |
| 28 | Get Rigid Body Velocity | Double Vector 3 | N/D | [x, y, z] N/D frame | N/A | N/A | N/A |
| 29 | Reference Body Velocity | Double Vector 3 | N/D | [x, y, z] N/D frame | N/A | N/A | N/A |
| 32 | Turn ON/OFF Autopilot | N/A | N/A | N/A | Byte | N/A | 1 is for on, 0 is off |
| 33 | Command Roll, Pitch, Yaw | N/A | N/A | N/A | Float Vector 3 | Unit | [roll, pitch, yaw] in body frame |
| 34 | Command Primary Thrust | N/A | N/A | N/A | Float | Unit | Primary thrust |
| 35 | Trigger next stage | N/A | N/A | N/A | N/A | N/A | N/A |
| 36 | Command Translation Thrusters | N/A | N/A | N/A | Float Vector 3 | Unit | [x, y, z] in body frame |
| 37 | Toggle Gear | N/A | N/A | N/A | N/A | N/A | N/A |
| 38 | Toggle Lights | N/A | N/A | N/A | N/A | N/A | N/A |
| 39 | Solar Panels | N/A | N/A | N/A | N/A | N/A | N/A |