STEAMVR™

Tracking Training

VALVE

STEAM® VR

Tracking Training

The JSON File

The JSON File

- Every object contains a file that describes it
- The file is in JSON format
- We use it so much, we call the “*The* JSON File”
- Already talked about sensor data, but there is more…

- Open **reference_object.json** in 100_the_json_file

Common Members

`"manufacturer" : "Valve"`	Company name
`"model_number" : "REF-HMD"`	Product model
`"device_class" : "controller"`	“hmd” or “controller”
`"device_vid" : 10462`	USB vendor ID
`"device_pid" : 8960`	USB product ID
`"device_serial_number" : "LHR-X"`	Serial number
`"render_model" : "ref_controller"`	Default render model

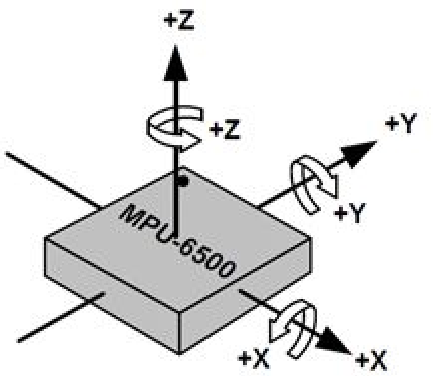
Sensor Positions

- Contains the three arrays that define sensor
    - Position
    - Orientation
    - Channel connection

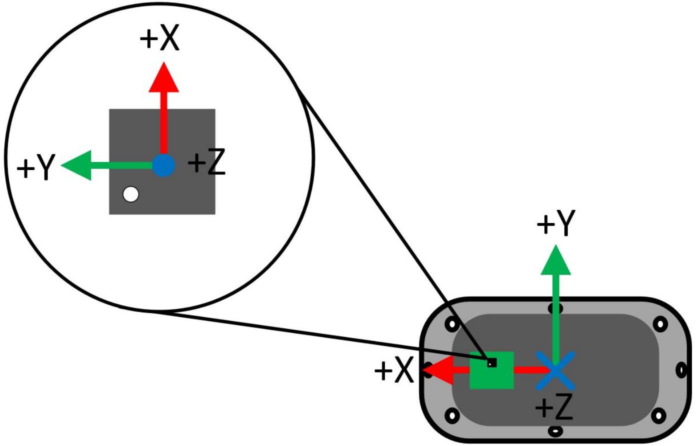
```
"lighthouse_config" : {
   "channelMap" : [...],
   "modelNormals" : [...],
   "modelPoints" : [...]
}
```

IMU Position

- Holds IMU calibration data
- Locates the IMU in the object’s coordinate system



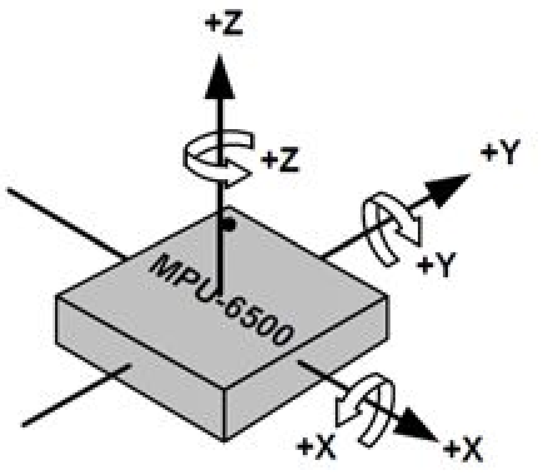
```
"imu" : {
   "acc_scale" : [ 1, 1, 1 ],
   "acc_bias" : [ 0, 0, 0 ],
   "gyro_scale" : [ 1, 1, 1 ],
   "gyro_bias" : [ 0, 0, 0 ],
   "plus_x" : [ 1, 0, 0 ],
   "plus_z" : [ 0, 0, 1 ],
   "position" : [ 0.0, 0.0, 0.0 ]
   }
```

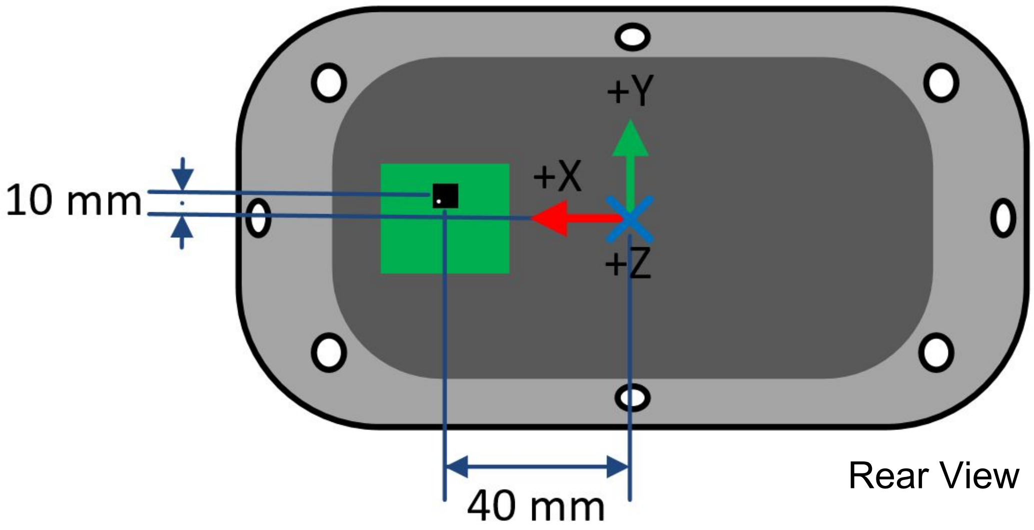


IMU Exercise

- Add “imu” to add_imu.json
- Visualize the json to verify placement
  - Use sensor_shape.scad as the shape

```
"imu" : {
   "acc_scale" : [ 1, 1, 1 ],
   "acc_bias" : [ 0, 0, 0 ],
   "gyro_scale" : [ 1, 1, 1 ],
   "gyro_bias" : [ 0, 0, 0 ],
   "plus_x" : [ ?, ?, ? ],
   "plus_z" : [ ?, ?, ? ],
   "position" : [ ?, ?, ? ]
   }
```





Rear View

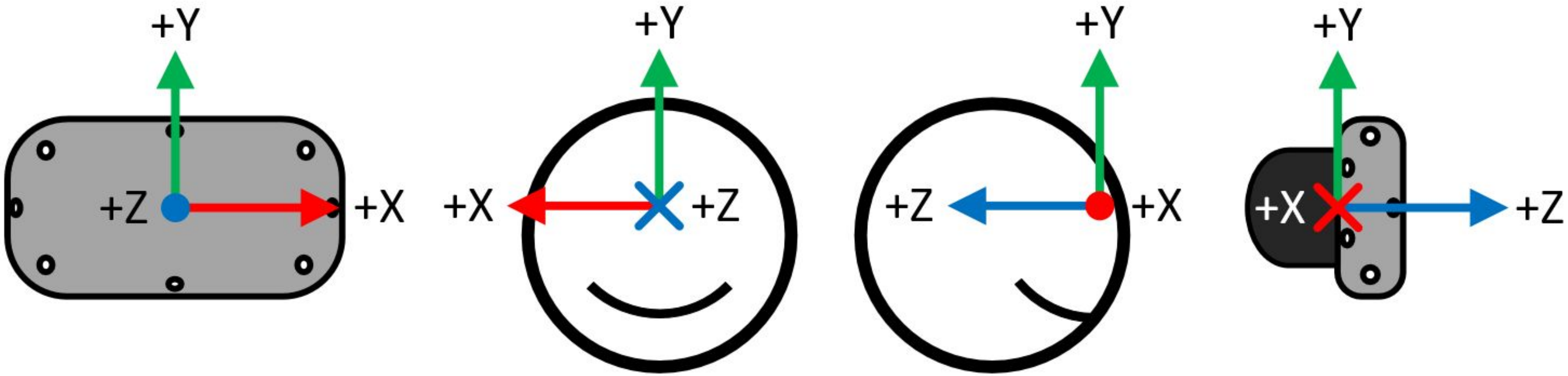
Mapping to SteamVR™ Coordinates

- The “head” variable describes the SteamVR coordinate system in the object’s coordinates.
- Different for HMDs and controllers

```
"head" : {
   "plus_x" : [ 1, 0, 0 ],
   "plus_z" : [ 0, 0, 1 ],
   "position" : [ 0.0, 0.0, 0.0 ]
}
```

HMD “head” Coordinates

- SteamVR HMD coordinates
  - Centered between the pupils
  - +Y is up
  - +X is to the user’s right
  - +Z is into the head
- **How would “plus_x”, “plus_z”, and “position” map in this example?**



HMD Specific Members

```
"direct_mode_edid_vid" : xxxxx
"direct_mode_edid_pid" : xxxxx
```

- Display EDID vendor ID
- Display EDID product ID

- HMDs require optics calibration data stored in the JSON file
- We are focused on tracking
- Optics are outside the scope of this class
- Working on HMDs? Valve can help!