**TABLE OF VARIABLES**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Description | Variable | Calculate/Measure | Code C | Value | Unit |
| Pi |  |  | ) | 3.141593 |  |
| Axes |  |  |  |  | None |
| Motors |  |  |  |  | None |
| Sample Time IMU (Period) |  |  |  | 100 |  |
| Sample Time EMCODER (Period) |  |  |  | 100 |  |
| Radius of the **B**all |  |  |  |  | mm |
| Radius of **O**mni **W**heels |  |  |  |  | mm |
| Radius of the **R**obot |  |  | #define RADIUS\_ROBOT () |  | mm |
| Height of the center of gravity |  |  |  |  | mm |
| Mass of the **R**obot |  |  |  |  | Kg |
| Mass of the **B**all |  |  |  |  | kg |
| Mass of the **O**mni **W**heels |  |  |  |  | kg |
| Inertia of the **B**all |  |  |  |  | Kgm2 |
| Inertia of the actuating wheel in the plane |  |  |  |  | Kgm2 |
| Inertia of the actuating wheel in the plane |  |  |  |  | Kgm2 |
| Inertia of the **R**obot body |  |  |  |  | Kgm2 |
| Inertia of the **R**obot body in the plane |  |  |  |  | Kgm2 |
| Gravitational Acceleration |  |  |  | 9.81 | m/s2 |
| Encoder ratio (pulses) |  |  | ) | 20 | pulses |
| Angle of **a** encoder’s pulse |  |  |  |  | Rad |
| Period between 2 successive pulses |  | {read from external input} | Variable’s name in C: |  |  |
| Encoder counter |  | {read form external interrupt} | Variable’s name in C: |  | pulses |
| Orientation of the robot body |  | {convert from values} | Function’s form: |  | Rad |
| Angular velocity of the robot body |  | {convert from values} | Function’s form: |  | Rad/s |
| Orientation of the ball |  | {convert from encoder’s values} | Function’s form: |  | Rad |
| Angles of the virtual actuating wheel |  |  |  |  | Rad |
| Angles of real Omni wheels |  |  |  |  | Rad |
| Length of Omni wheels’ Arc |  |  |  |  | mm |
| Angular velocity of real Omni wheels |  |  | #define omega(MOTOR) (OMEGA\_J/ periodEncoderPulse(MOTOR)) |  | Rad/s |
| Velocity of Ball |  |  |  |  | mm/s |
| Coordinate of Ball |  |  |  |  | mm |
| LQR matrices |  |  |  |  | None |
| Matrices |  |  |  |  | None |