Amsterdam University of Applied Sciences

Rover Rescue System

Documentation

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1 Introduction

In the (near) future robots will be more and more part of our daily life. Even more than they are already part of society today. Industrial robots are nowadays very common, the use of drones by military and civilians triggers discussion and science is creating robots to take care of people who need help. Functioning more or less autonomous requires that such machines have to be robust, take their own decisions and operate in a safe way.

Thus we created a robot that helps to rescue people trapped in a collapsed building.

The user is able to control the robot using the combination of a controller, specifically a Steam Controller, and a moblie phone as display used by the Google Cardboard. Of course, being a robot, the robot itself wants to do as much as possible. The degree of autonomy of the robot has been focused on assisting the user as much as possible.

2 Use Cases

TODO

3 Definition of Ready

1. Must have clear description.
2. Must have a milestone.
3. Must have a estimate for the burndown chart.
4. Issues from the same type must be organised in epic's.
5. Relevant issues must be done before continuing.
6. Previous sprint issues must be done before new sprint issues. (Except icebox issues)
7. Issues can't be large and vague, should be split in multiple issues.

4 Definition of Done

4.1 Feature

1. DoD of each single User story, included in the Sprint are met
2. “To do‘s“ are completed
3. All unit tests passing
4. Product backlog updated
5. Project deployed on the test environment identical to production platform
6. Tests on devices/browsers listed in documentation passed
7. Tests of backward compatibility passed
8. The performance tests passed
9. All bugs fixed
10. Sprint marked as ready for the production deployment by the Product Owner

4.2 Sprint

1. Code Complete
2. Environments are prepared for release
3. All unit & functional tests are green
4. All the acceptance criterias are met
5. QA is done & all issues resolved
6. All “To Do“ annotations must have been resolved
7. OK from the team: UX designer, developer, software architect, project manager, product owner, QA, etc.
8. Check that no unintegrated work in progress has been left in any development or staging environment.
9. Check that TDD and continuous integration is verified and working

5 Domain model

TODO

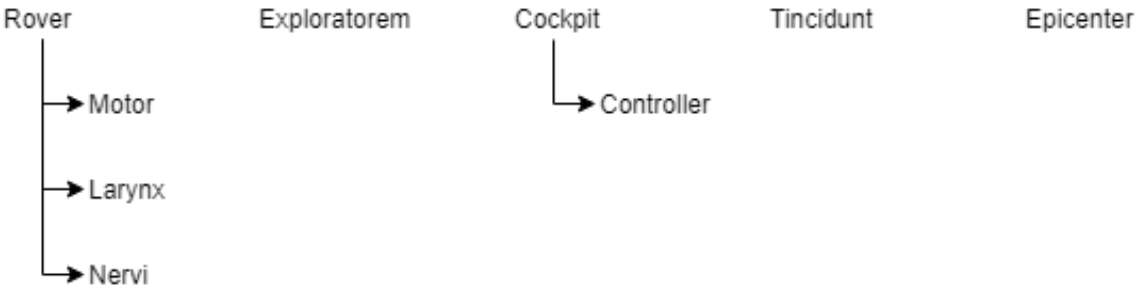
6 System sequence diagram

TODO

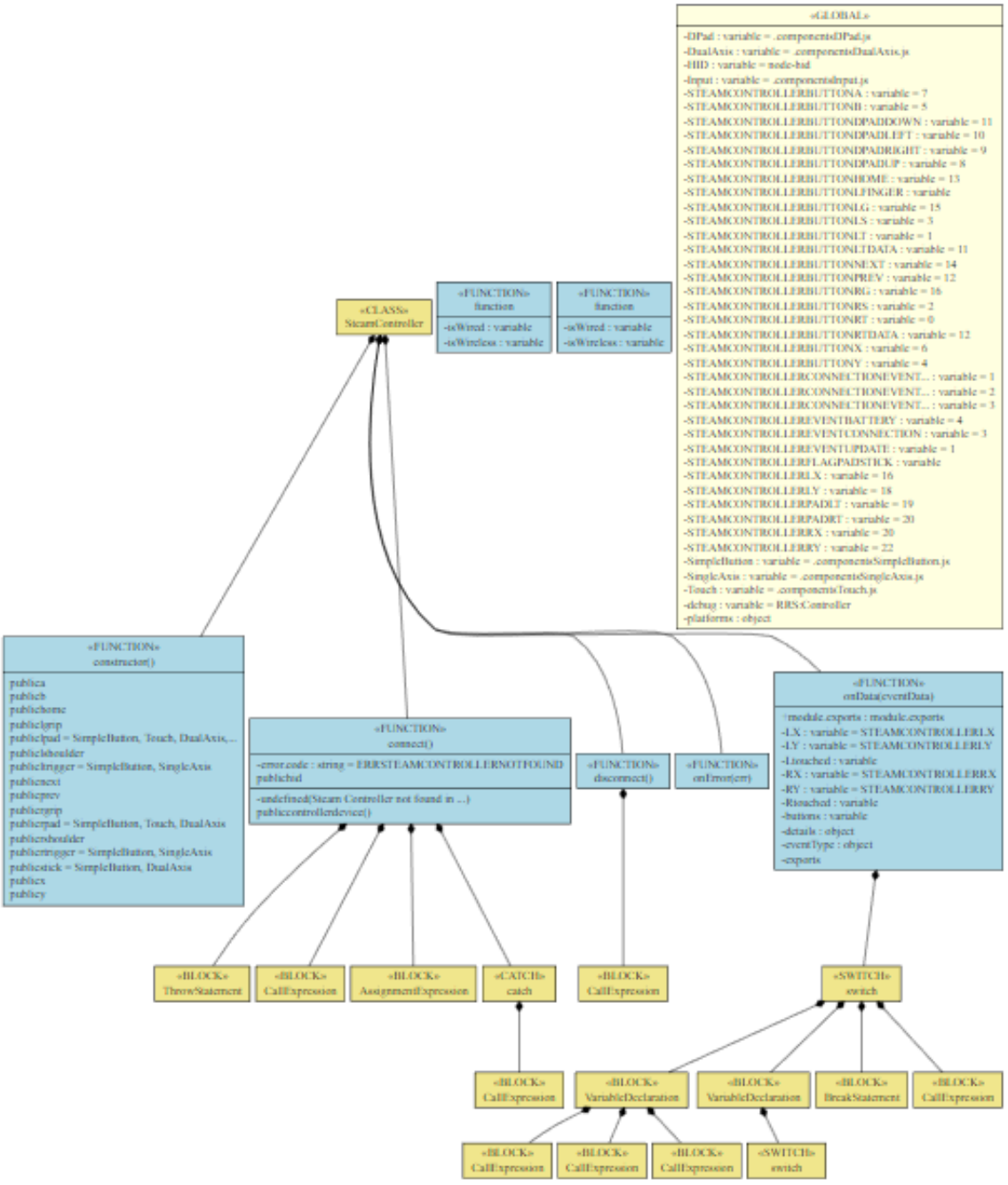
7 Class Diagrams

The class diagrams are a visual representation on how the RRS has been structured. The project overview given below shows which modules are submodules from the overheading modules. In the UML diagrams below there has been given a precise and complete overview of the class diagrams per module. These diagrams have been made using a generating tool in a command line interface.

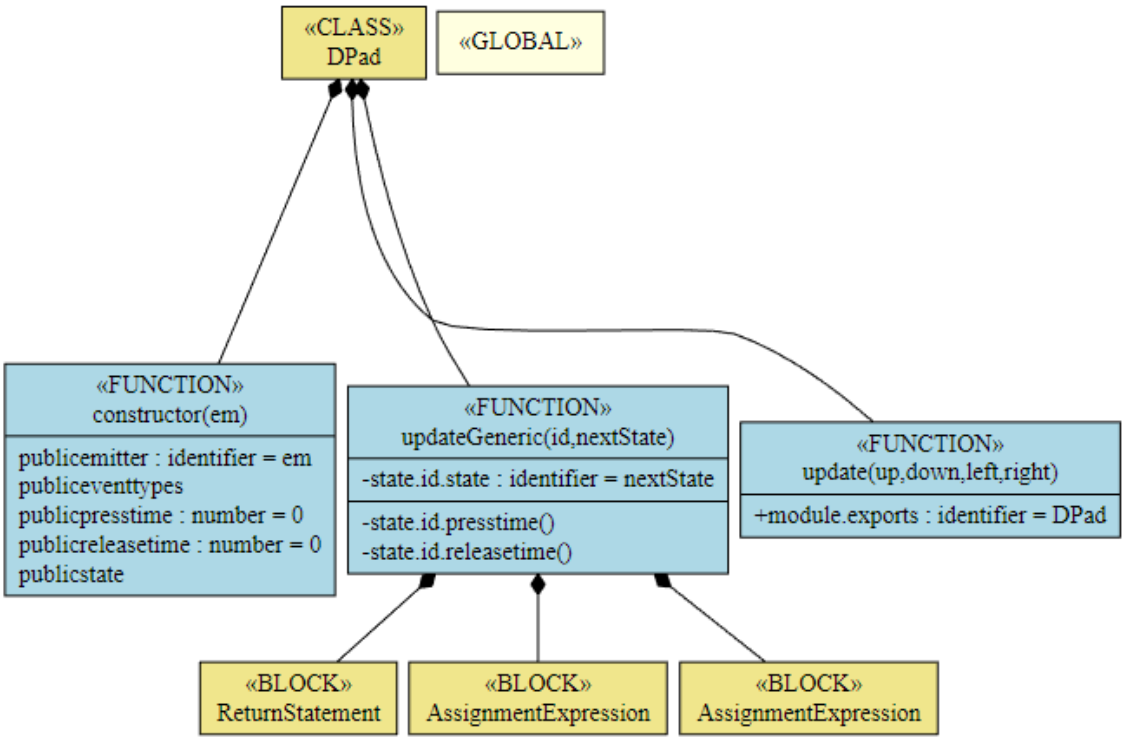
7.1 Project Overview



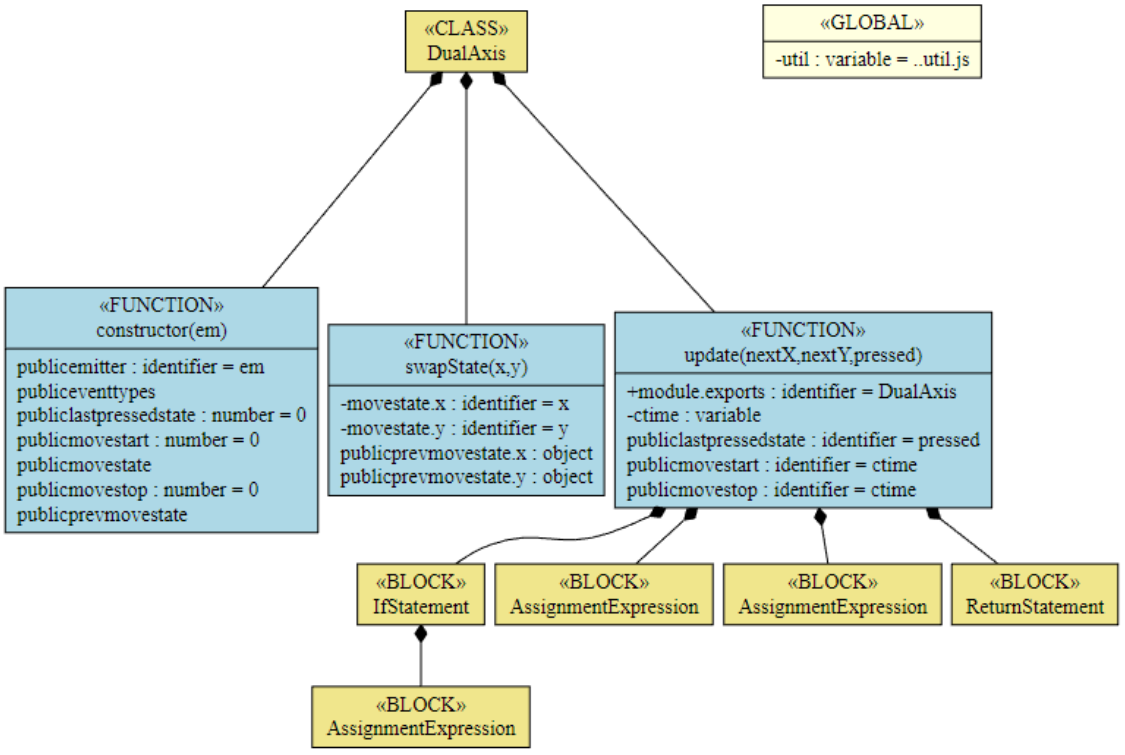
7.2 Controller - Steam Controller



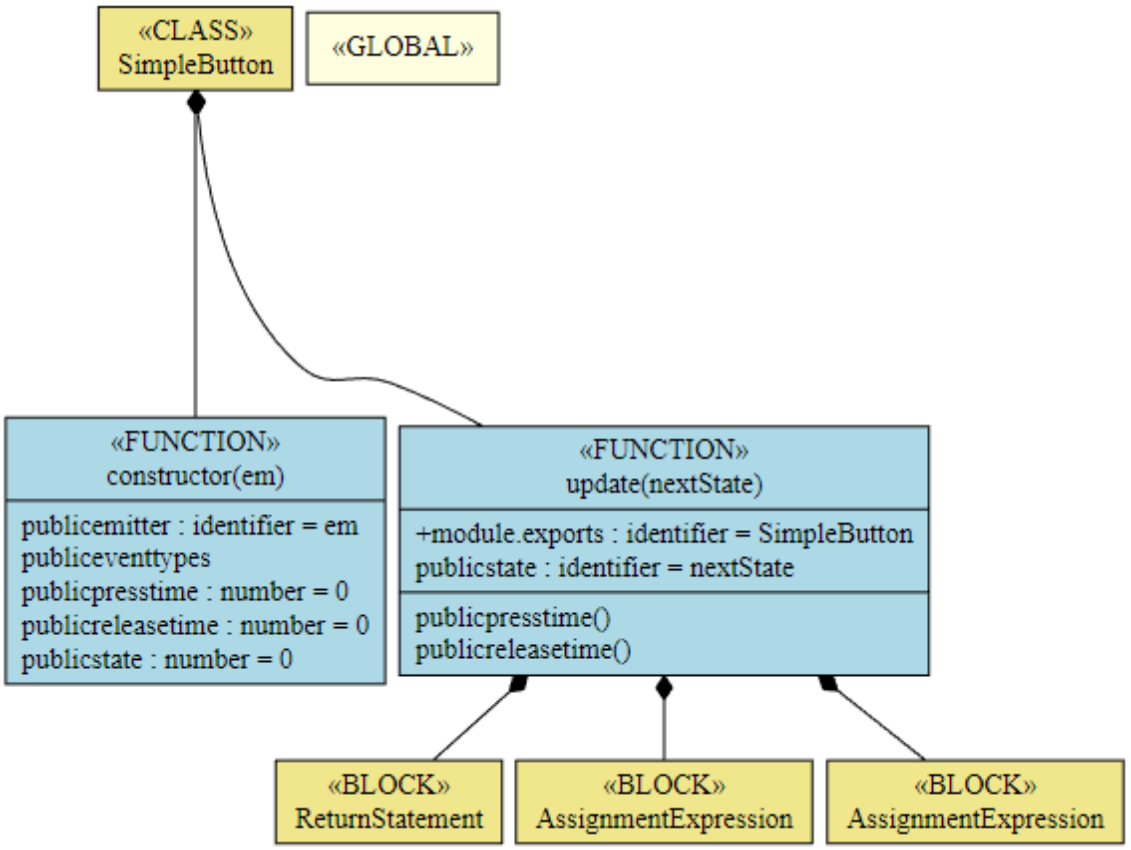
7.3 Controller - DPad



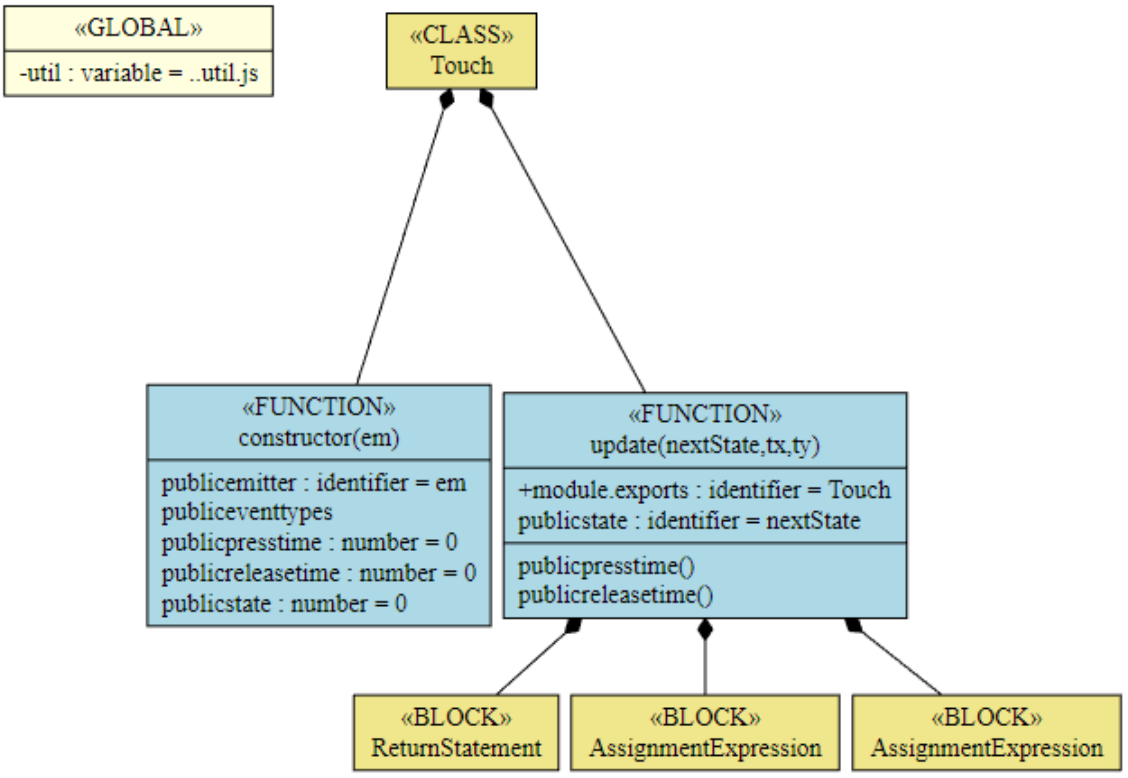
7.4 Controller - Dual Axis



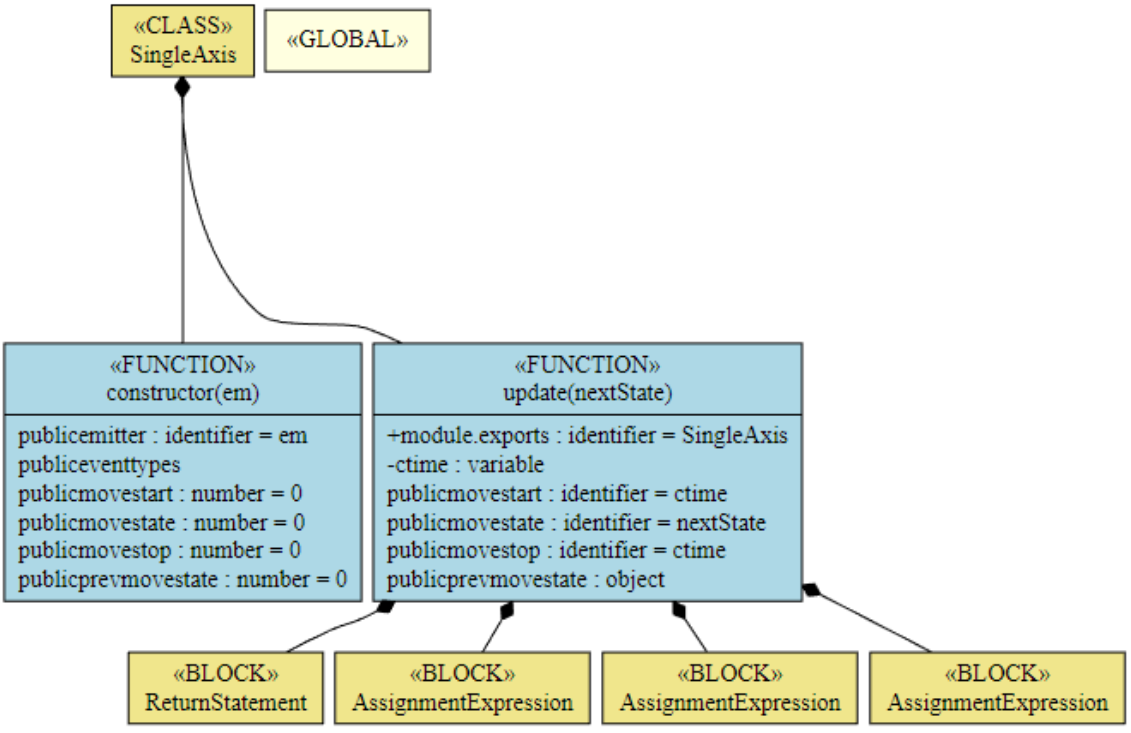
7.5 Controller - Simple Button



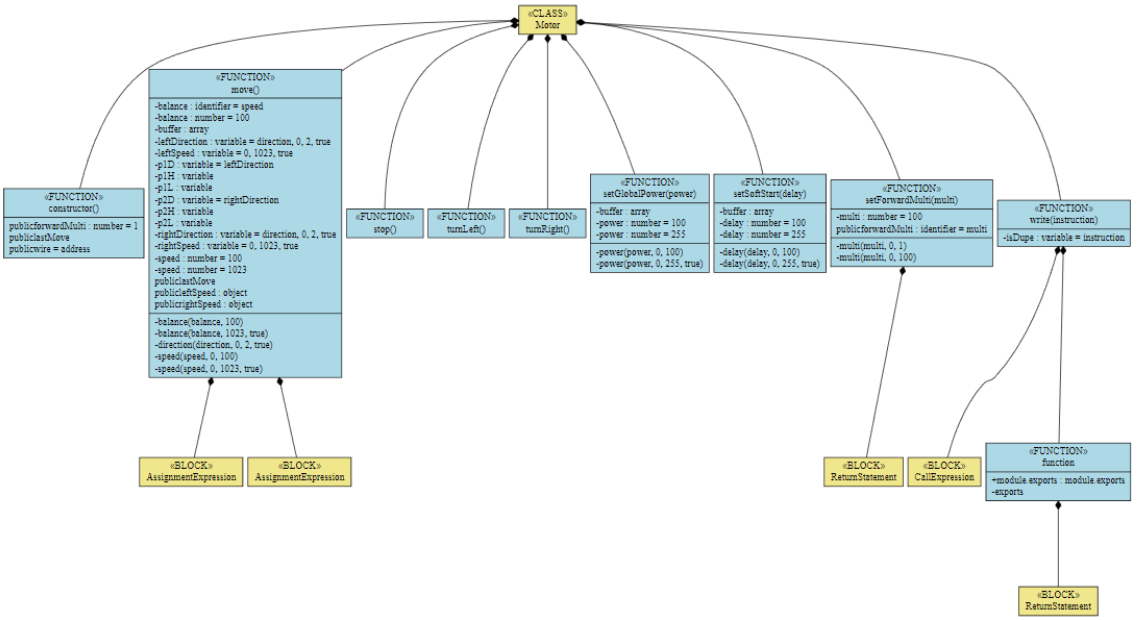
7.6 Controller - Touch



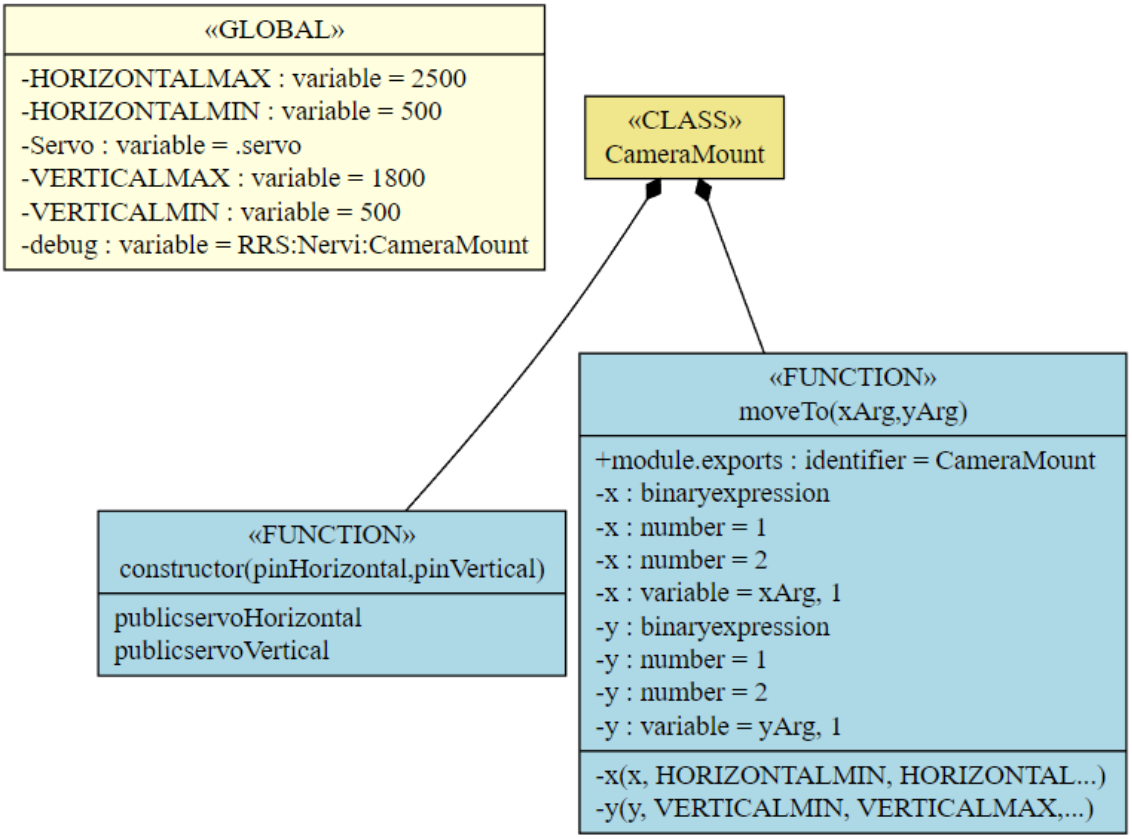
7.7 Controller - Single Axis



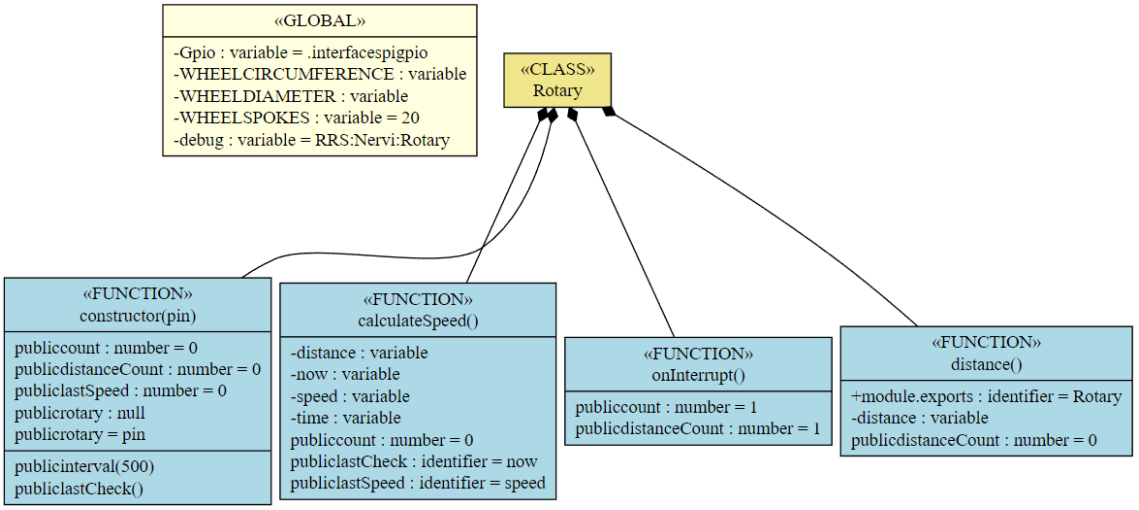
7.8 Motor


«CLASS»
Motor
«FUNCTION»
constructor()
publicforwardMulti : number = 1
publiclastMove
publicwire = address
«FUNCTION»
move()
-balance : identifier = speed
-balance : number = 100
-buffer : array
-leftDirection : variable = direction, 0, 2, true
-leftSpeed : variable = 0, 1023, true
-p1D : variable = leftDirection
-p1H : variable
-p1L : variable
-p2D : variable = rightDirection
-p2H : variable
-p2L : variable
-rightDirection : variable = direction, 0, 2, true
-rightSpeed : variable = 0, 1023, true
-speed : number = 100
-speed : number = 1023
publiclastMove
publicleftSpeed : object
publicrightSpeed : object
-balance(balance, 100)
-balance(balance, 1023, true)
-direction(direction, 0, 2, true)
-speed(speed, 0, 100)
-speed(speed, 0, 1023, true)
«FUNCTION»
stop()
«FUNCTION»
turnLeft()
«FUNCTION»
turnRight()
«FUNCTION»
setGlobalPower(power)
-buffer : array
-power : number = 100
-power : number = 255
-power(power, 0, 100)
-power(power, 0, 255, true)
«FUNCTION»
setSoftStart(delay)
-buffer : array
-delay : number = 100
-delay : number = 255
-delay(delay, 0, 100)
-delay(delay, 0, 255, true)
«FUNCTION»
setForwardMulti(multi)
-multi : number = 100
publicforwardMulti : identifier = multi
-multi(multi, 0, 1)
-multi(multi, 0, 100)
«FUNCTION»
write(instruction)
-isDupe : variable = instruction
«BLOCK»
AssignmentExpression
«BLOCK»
AssignmentExpression
«BLOCK»
ReturnStatement
«BLOCK»
CallExpression
«FUNCTION»
function
+module.exports : module.exports
-exports
«BLOCK»
ReturnStatement

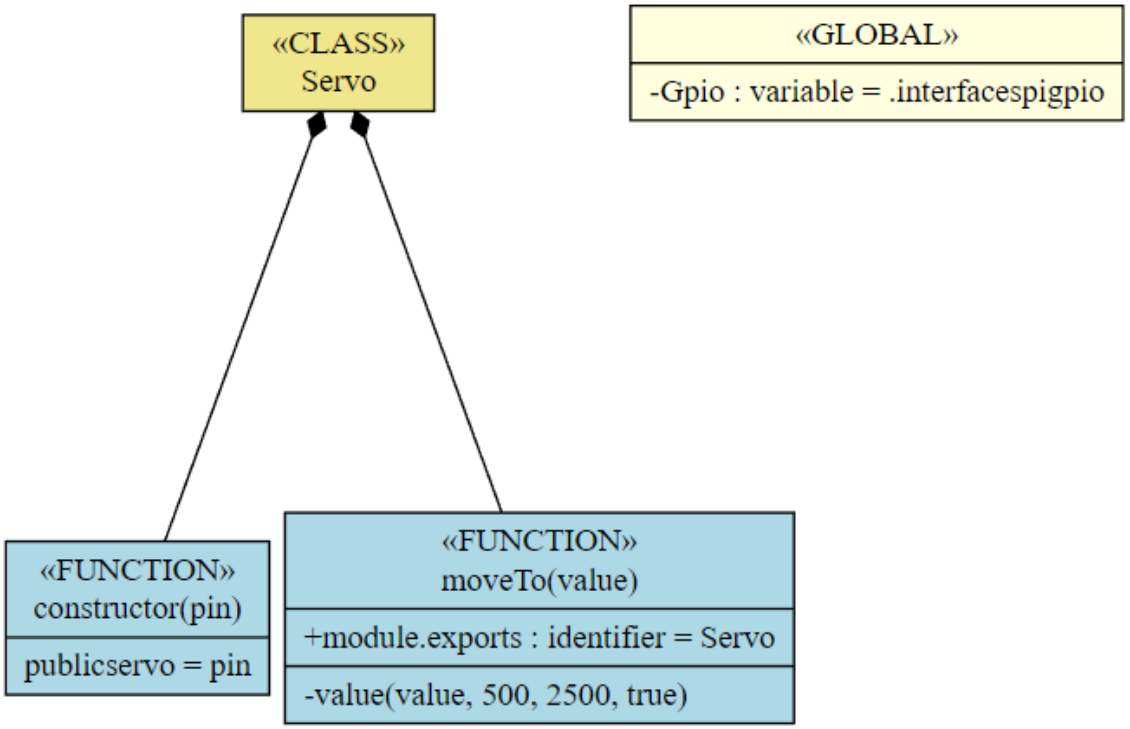
7.9 Nervi - Camera Mount



7.10 Nervi - Rotary Encoder



7.11 Nervi - Servo



7.12 Nervi - Ultrasonic