E-Puck Monitor Multiplatform Manual

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1 Introduction

The application was developed in order to communicate with the E-Puck
through a bluetooth connection and visualize the information received from
its sensors in a simple interface. The E-Puck robot must be equipped with the
starting demo shipped with the robot (can be downloaded from http://www.gctronic.com/).
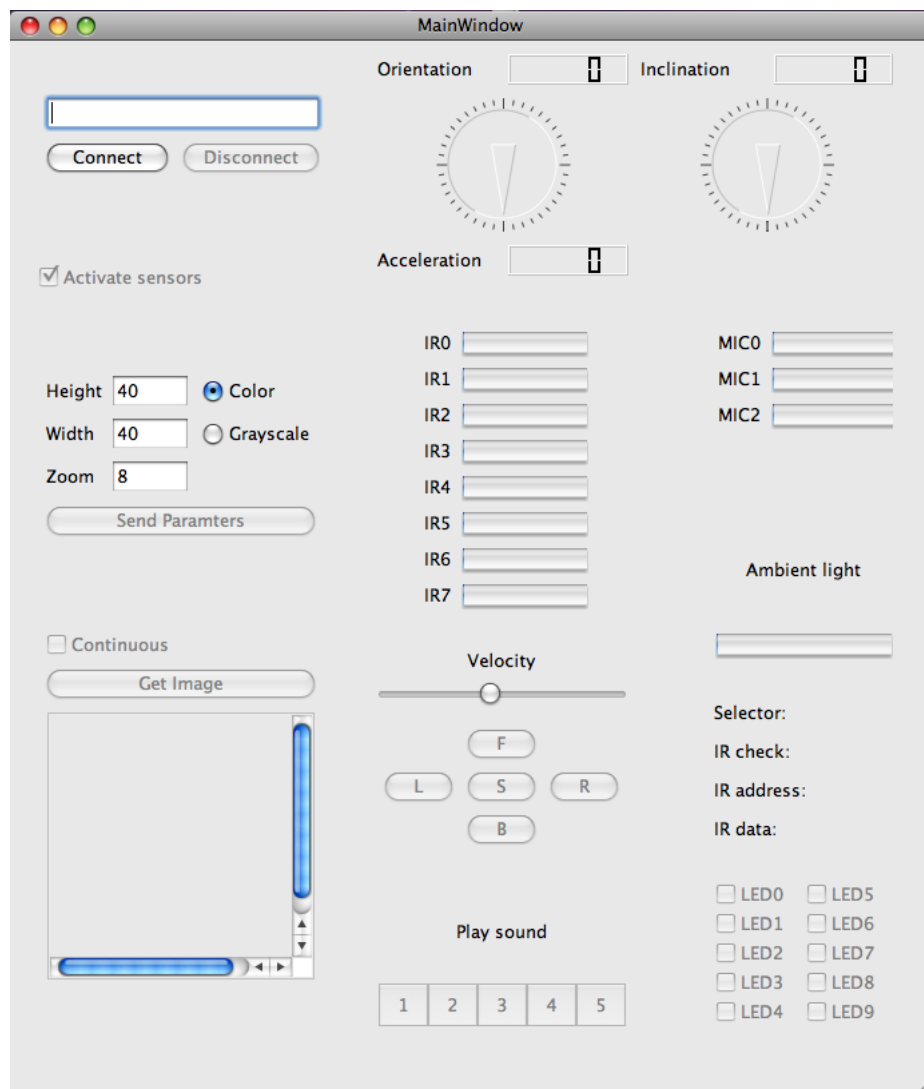The figure 1 shows the main window of the monitor.

Figure 1: Main window

2　Connection

Before starting the application, the E-Puck robot must be recognized by the computer as a bluetooth device; after that the application can be started. In the text field on the upper left side of the main window, shown in figure 2, must be inserted the name identifying the E-Puck robot (e.g. /dev/tty.e-puck_1594-COM1-1) and then click *Connect*; after a short while the connection will be established. In case of error a dialog box will be shown indicating that the connection cannot be established at the moment.
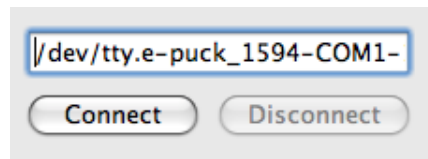

Figure 2: Connection text field

3　Image receiving

The E-Puck robot is equipped with a camera and from the interface is possible either to receive one single image at a time by clicking on the button *Get Image*, or to receive continuously the images (as a video camera) activating the checkbox *continuous*; an example is shown in figure 3.

3.1　Camera parameters

The images received from the camera can be customized sending some parameters to the robot; the parameters that can be setup are:

- height: the height of the image that will be received in pixels unit; the values must range between 1 and 255.

- width: the width of the image that will be received in pixels unit; the values must range between 1 and 255.

- zoom: the possible values for the zoom are 1, 4, 8.

- image type: the image received can be either a color image or a grayscale image
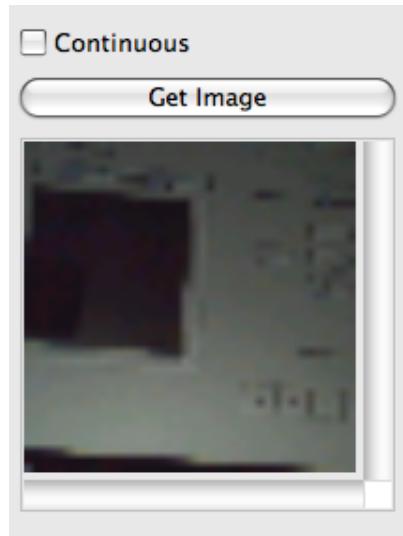
Figure 3: Get image

After setting up the various parameters the button *Send Parameters* must be clicked, then the next image that will be received will be constrained on these settings. The figure 4 illustrates an example of an image for which the size was changed (20x20 pixels).
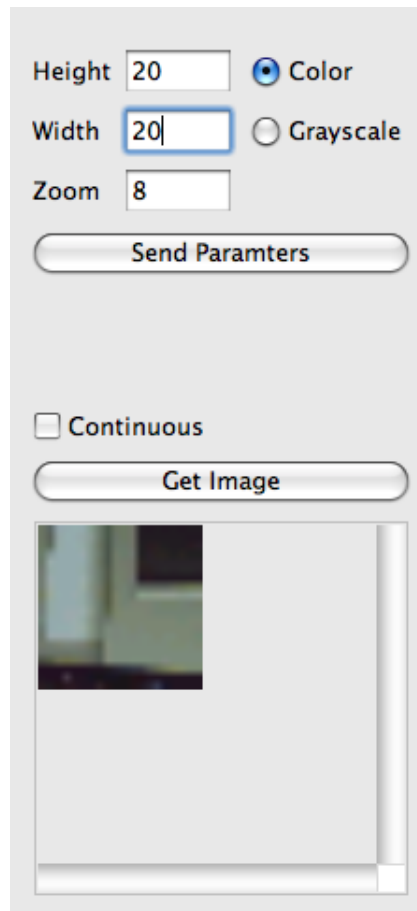
Figure 4: Camera parameters

4 Sensors and actuators

The sensors information are available only after activating them by checking the checkbox *Activate sensors* located on the upper left side of the window. Afterwards will be explained the information visualized on the interface related to the sensors and actuators.

4.1 Accelerometer

The interface contains a section dedicated to the accelerometer data, that are:

- the intensity of the acceleration

- the orientation of the acceleration vector in the horizontal plan:
    - 0 = inclination to the front (front part lower than rear part)
    - 90 = inclination to the left (left part lower than right part)
    - 180 = inclination to the rear (rear part lower than front part)
    - 270 = inclination to the right (right part lower than left part)
- the inclination angle of the robot with the horizontal plan:
    - 0 = E-Puck horizontal (normal position)
    - 90 = E-Puck vertical
    - 180 = E-Puck horizontal but up-side-down

These components are related to the acceleration that the e-puck is enduring, see figure 5.
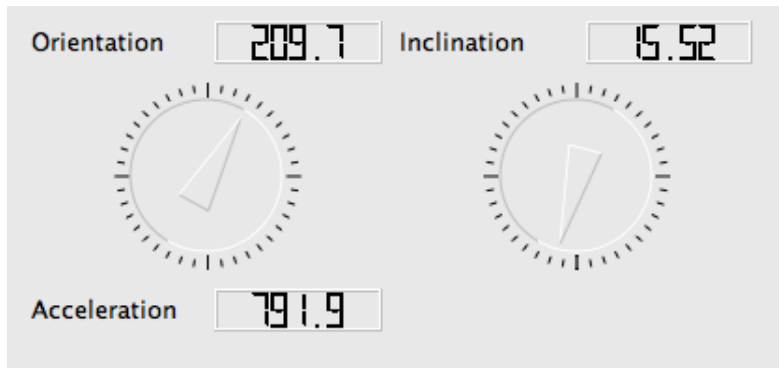

Figure 5: Accelerometer

4.2 Proximity sensors

The interface contains a section dedicated to the proximity sensors, see figure 6. When an object goes closer to the E-Puck, then the bars change their state; the bar state grows proportionally to the proximity of an object to the E-Puck. The figure 7 shows the relation between the interface sensors bars and the position of the sensors on the robot. Moreover with the proximity sensors is possible to measure also the ambient light, that is illustrated in figure 8
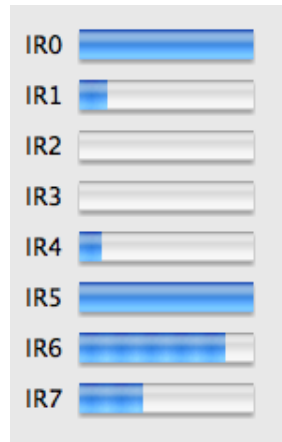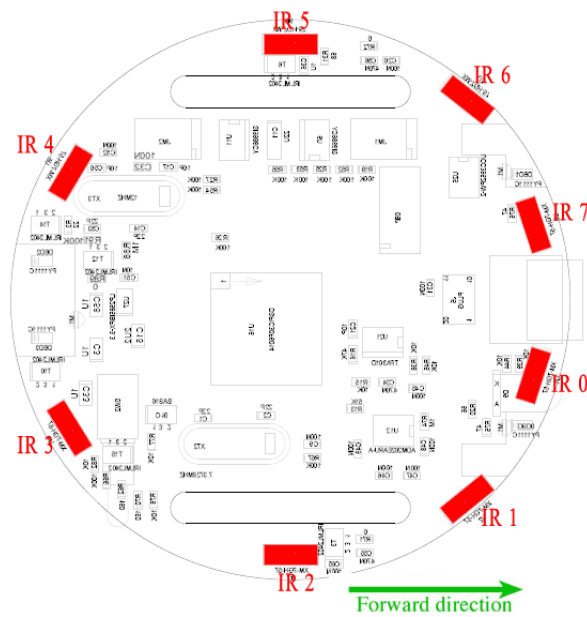
Figure 6: Proximity sensors
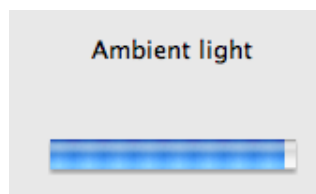

Figure 7: Proximity sensors on the robot

Figure 8: Ambient light

4.3 Sound sensors

The interface contains a section dedicated to the three microphones mounted on the E-Puck robot, see figure 9. The figure 10 shows the relation between the interface sensors bars and the position of the sensors on the robot.
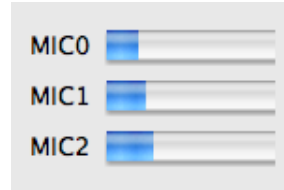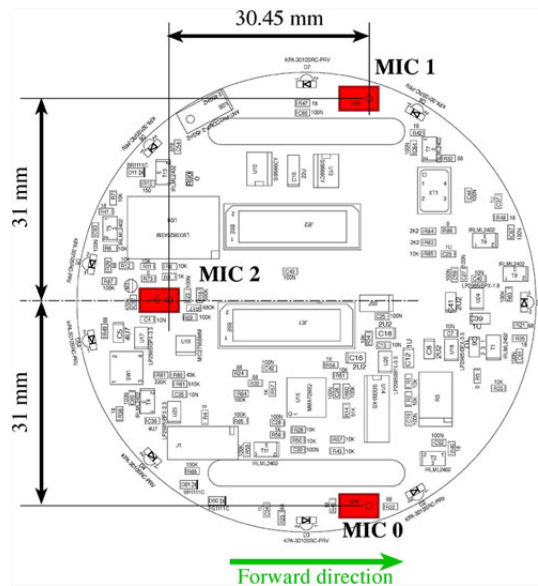

Figure 9: Microphones

Figure 10: Sound sensors position

4.4 Selector

The interface contains a section dedicated to the selector which displays its current position, see figure 11. The figure 12 shows the possible values of the selector on the robot.
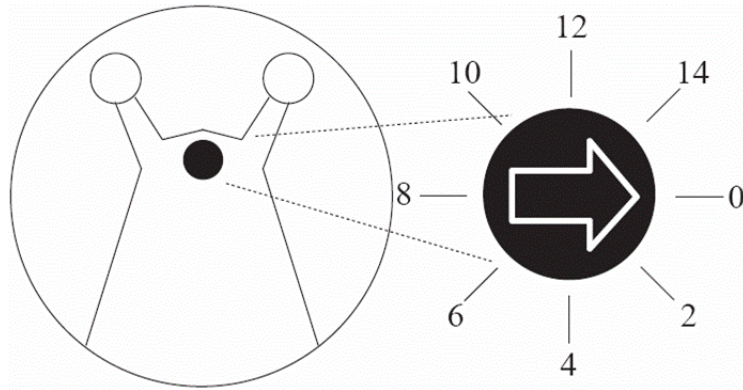
Figure 11: Selector

Figure 12: Selector values

4.5 Infrared sensor

The interface contains a section dedicated to the infrared sensor mounted on the E-Puck robot, see figure 13.

Figure 13: Infrared sensor

4.6 LEDs

The interface contains a section dedicated to the leds mounted on the E-Puck robot, see figure 14. Checking one of the checkboxes results in turning on the corresponding led. The figure 15 shows the relation between the interface leds (LED0-LED7) checkboxes and the position of the leds on the robot; LED8 and LED9 checkboxes correspond respectively to the body led and to the front led
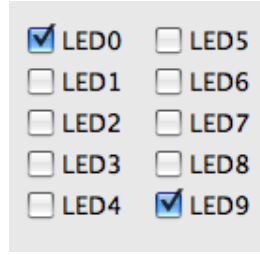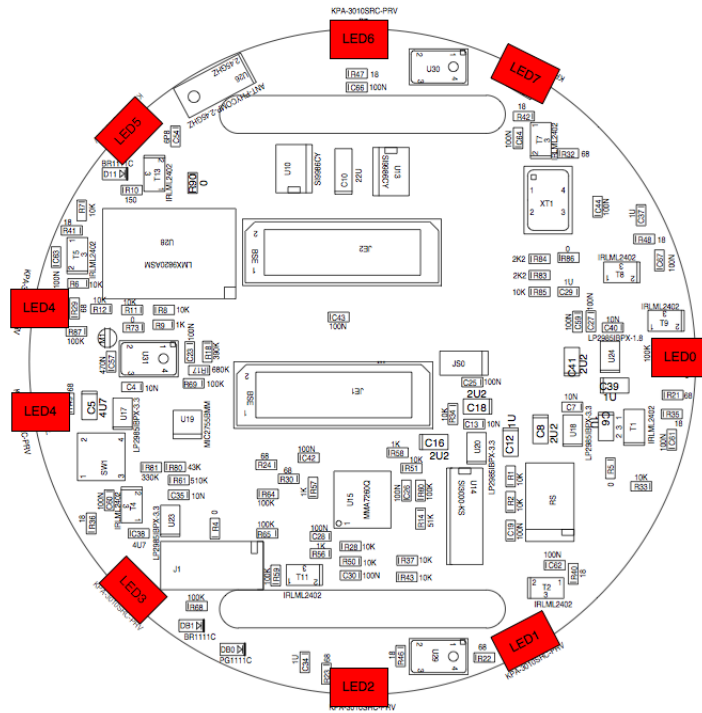
Figure 14: LEDs

Figure 15: LEDs position

4.7 Motors

The interface contains a section dedicated to the motion of the robot, see figure 16. It's possible to move the robot forward (F button), backward (B button), turn left (L button) and turn right (R button); with the S button the robot will stop. Moreover it's possible to change the velocity of the movements with the slider located upon the motion buttons (the velocity will change only for the next movements, that is if the robot is already in

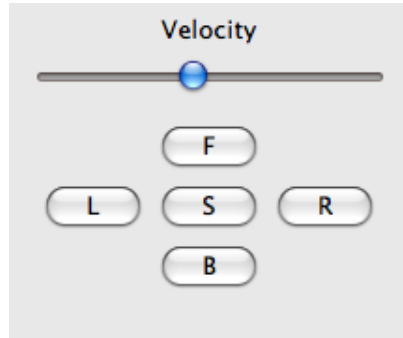motion its velocity doesn't change until a new command will be sent).

Figure 16: Motors

4.8   Speaker

The interface contains a section dedicated to the speaker mounted on the
E-Puck robot, see figure 17. There are five buttons, each one producing a
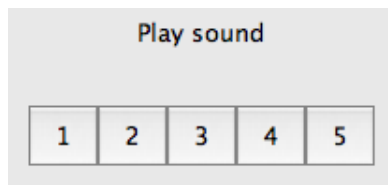different sound.

Figure 17: Speaker