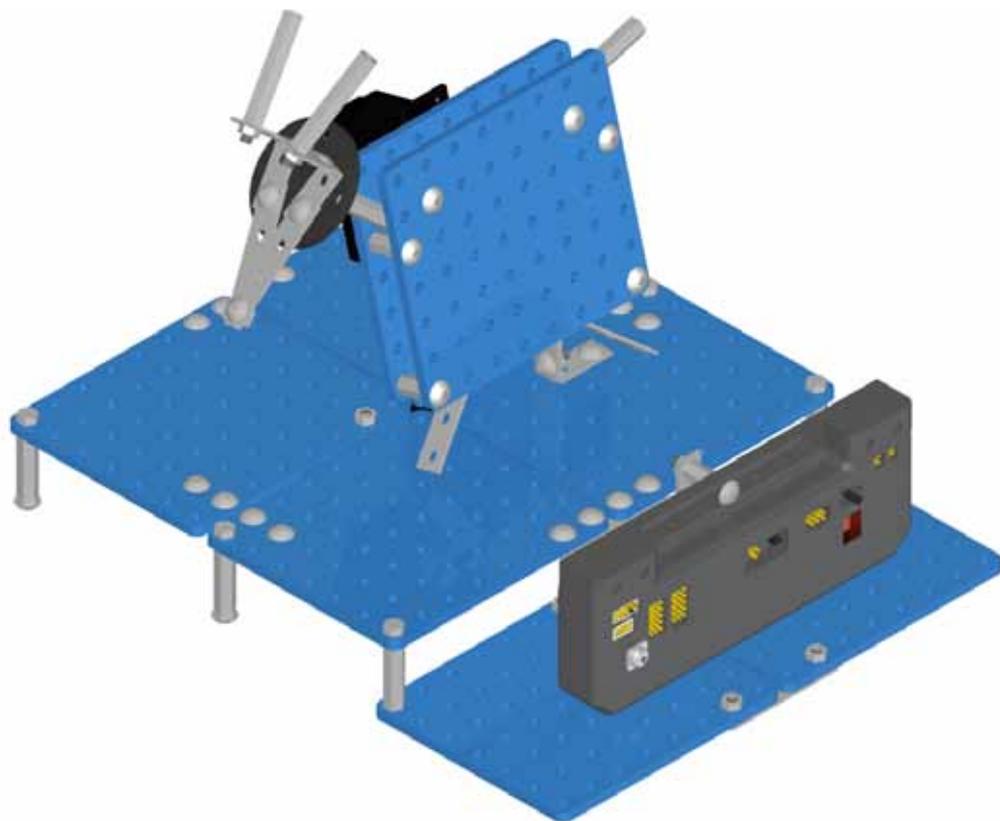


## 4. Rodeo Robot



# Introduction and working principle

## – Infrared Sensor



Figure 1. Emitter and Receiver

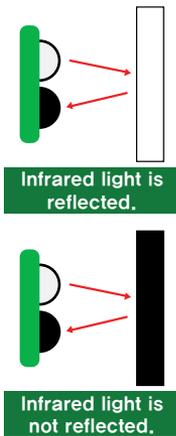


Figure 2. Infrared reflection values by sensor

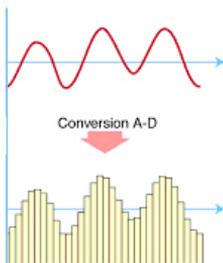


Table 1. Analog values detected by sensor

Rodeo Robot receives Sensor Value from the Smart Control Board bonded to frame. The Smart Control Board is able to read Sensor Value by using two infrared sensors located at each end of the board, at lower position near ground level. The Rodeo Robot that moves randomly is enabled to be balanced by modifying the input Sensor Value. When the Rodeo Robot comes to lean leftward, it is able to be balanced by moving control board rightward, and vice versa. If overly leaned toward a side, it comes to fall over toward a leaned side.

The principle that works out this robot hides behind infrared sensor.

Infrared sensors are used to distinguish between black and white surfaces. White surfaces reflect all types of light while black surfaces absorb them. An Infrared sensor consists of an emitter and receiver. Emitter is a circuit that simply emits infrared, and receiver is a circuit that collects it.

For instance, when the infrared transmitted from emitter touches white obstacles, it is reflected. The reflected infrared is collected by the receiver. If the infrared transmitted from emitter touches black obstacles, no infrared is collected by the receiver as there is none available. When the reflected infrared is collected by the receiver, it is expressed in a phrase as 'the sensor is detected'.

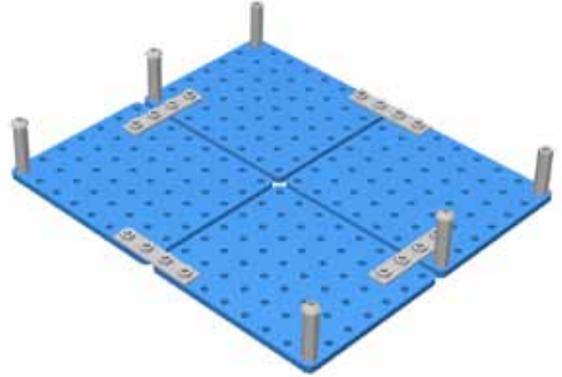
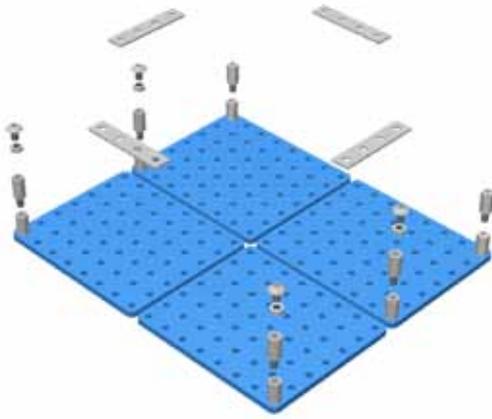
Detected Sensor Value is input in the form of analog value. It varies according to the amount of infrared light received.

- Analog : a continuous physical variable
- Digital : involving or using numerical digits expressed in a scale of notation, usually in the binary system, to represent discretely all variables occurring in a problem.

Sensor-detected analog values that are continuously varied need to be converted into digital values in robot. A/D Converter (or ADC, Analog-to-Digital Converter) is a device that converts a continuous physical quantity to a digital number that represents the quantity's amplitude. A continuous-time and continuous-amplitude analog signal input is converted to a discrete-time and discrete-amplitude digital signal output by the converter.

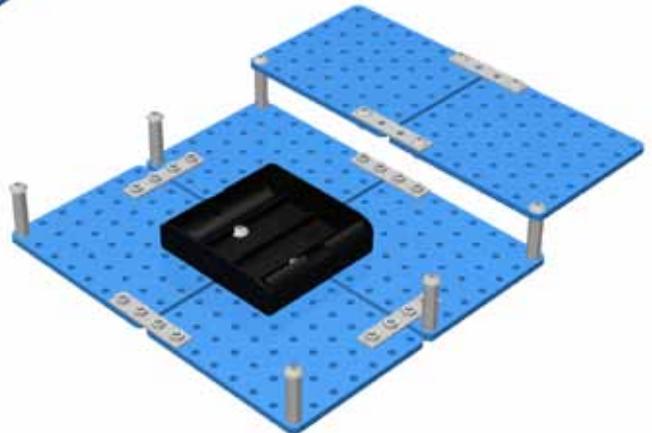
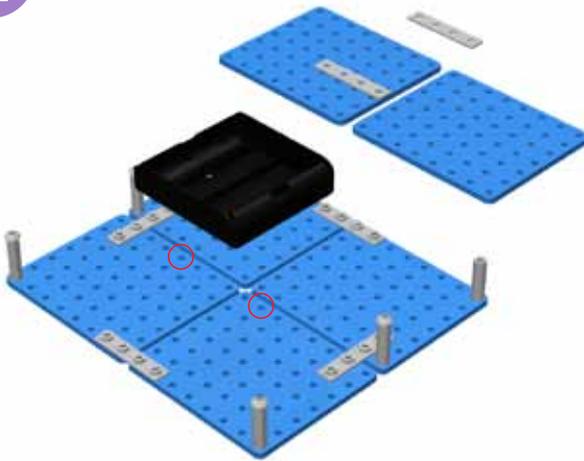
The number of discrete-amplitude values Smart Rokit can produce is 1024 (0~1023). ADC discrete-amplitude value is used as default value, that is, the basis when we use sensors.

1

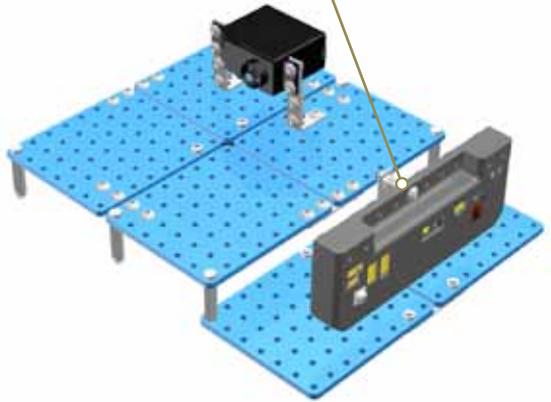
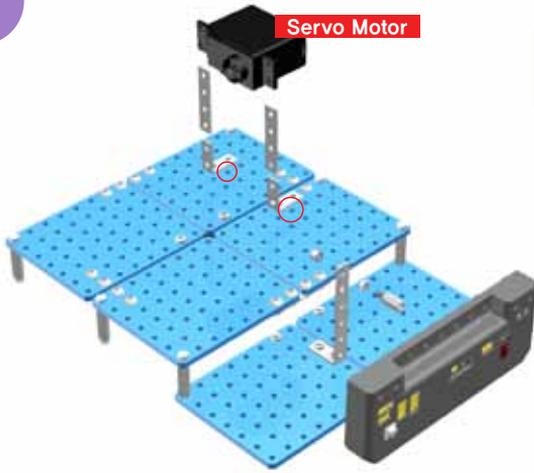


10mm X 12

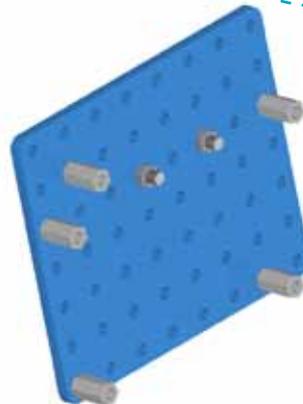
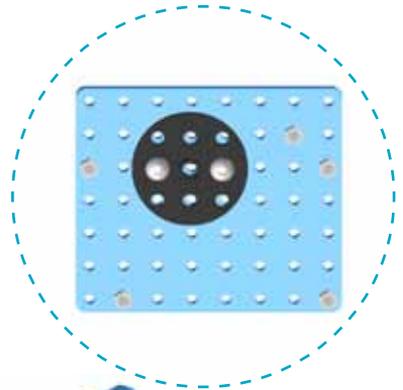
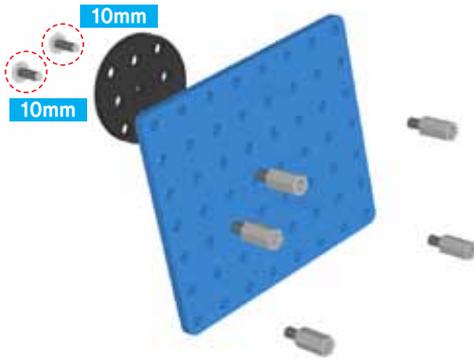
2



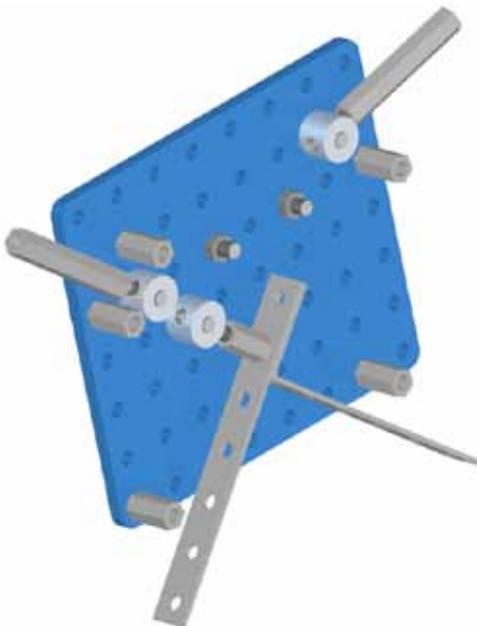
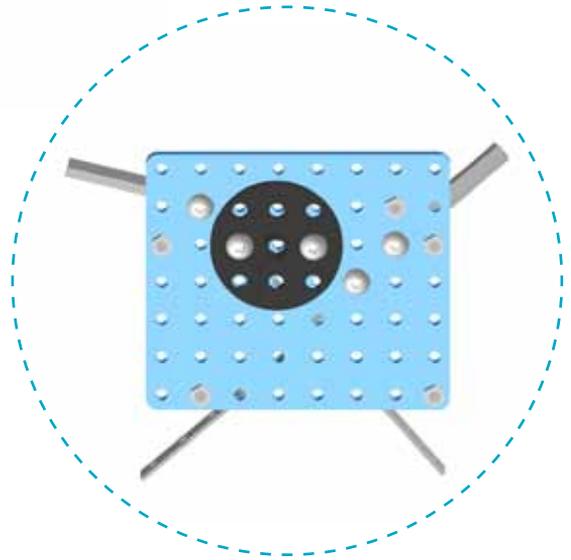
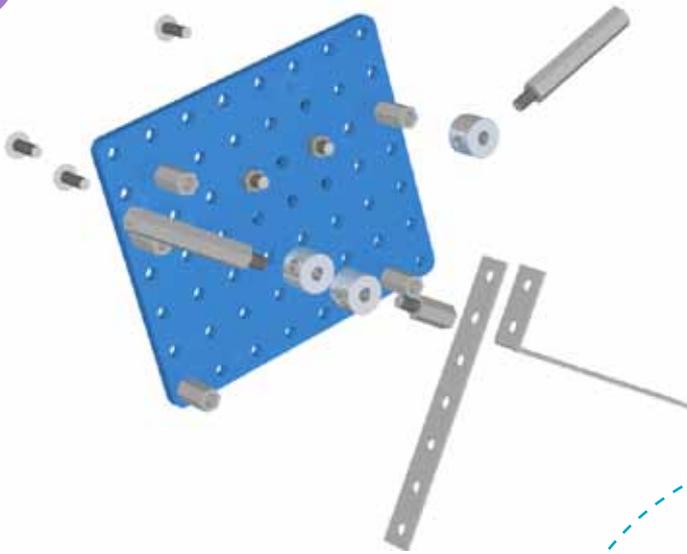
3



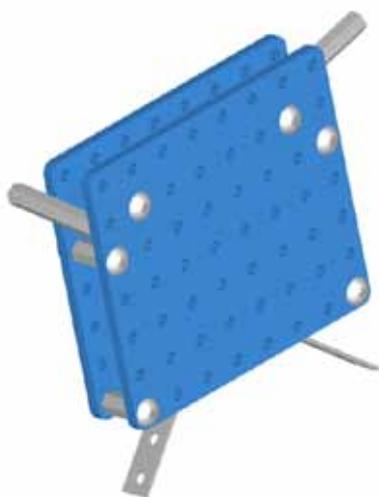
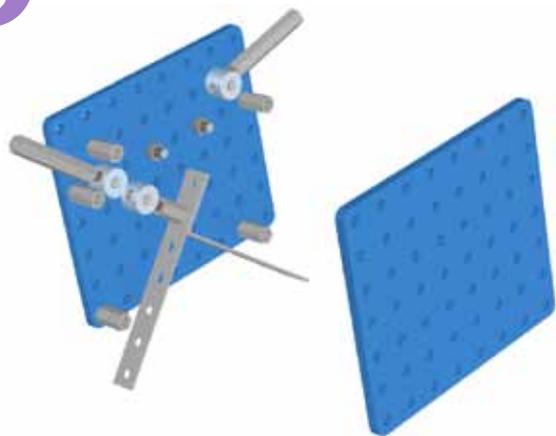
4



5



6



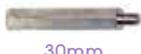
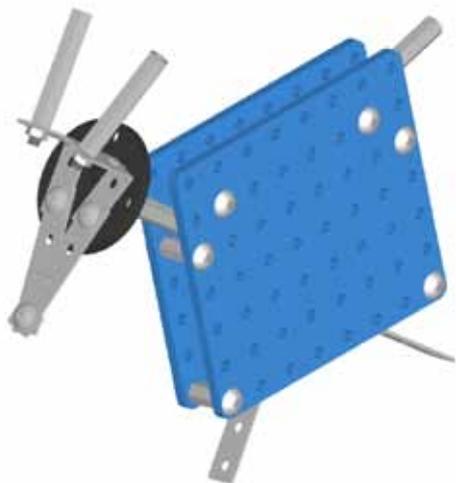
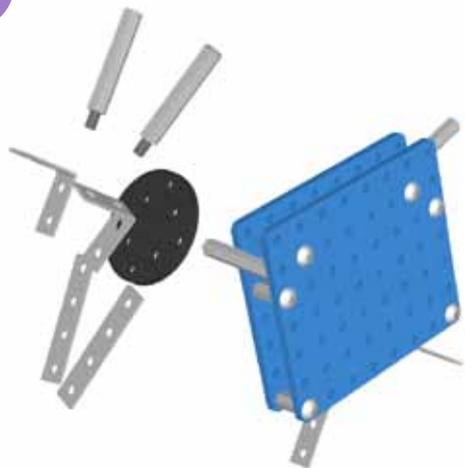
X 9



30mm

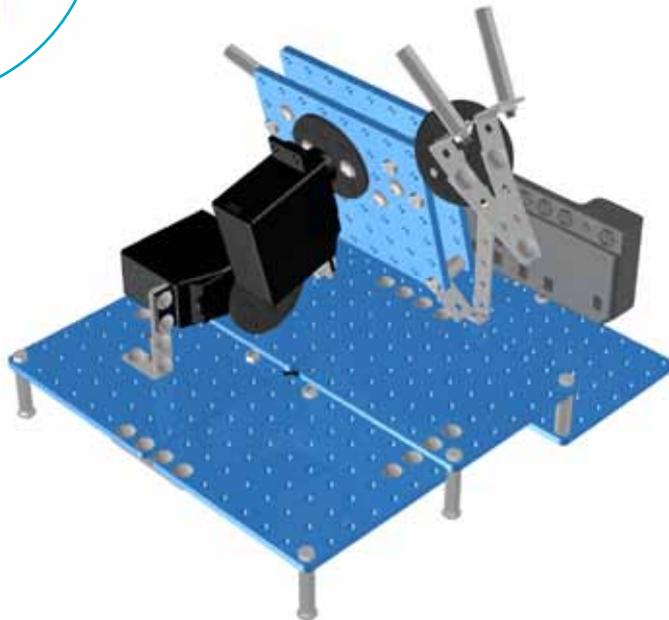
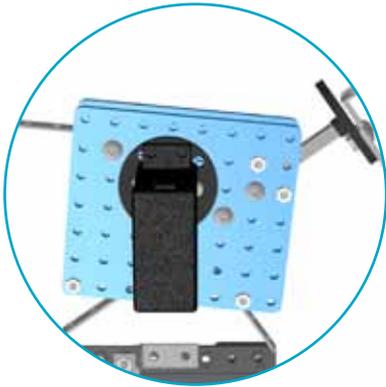
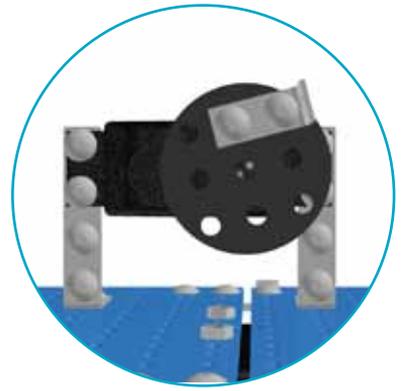
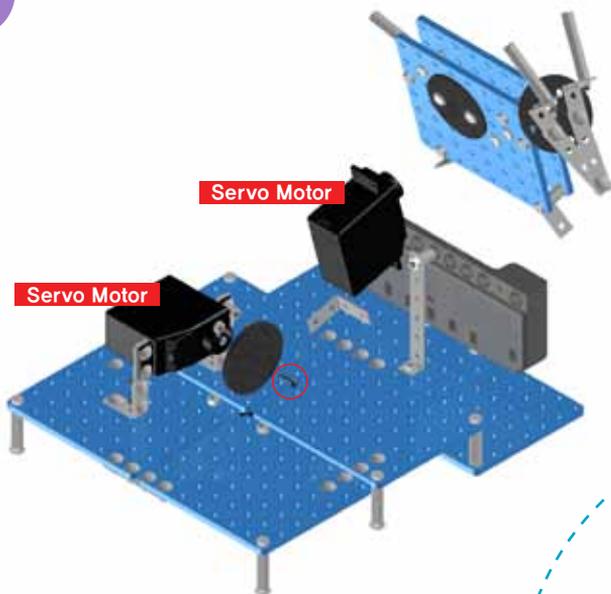
X 2

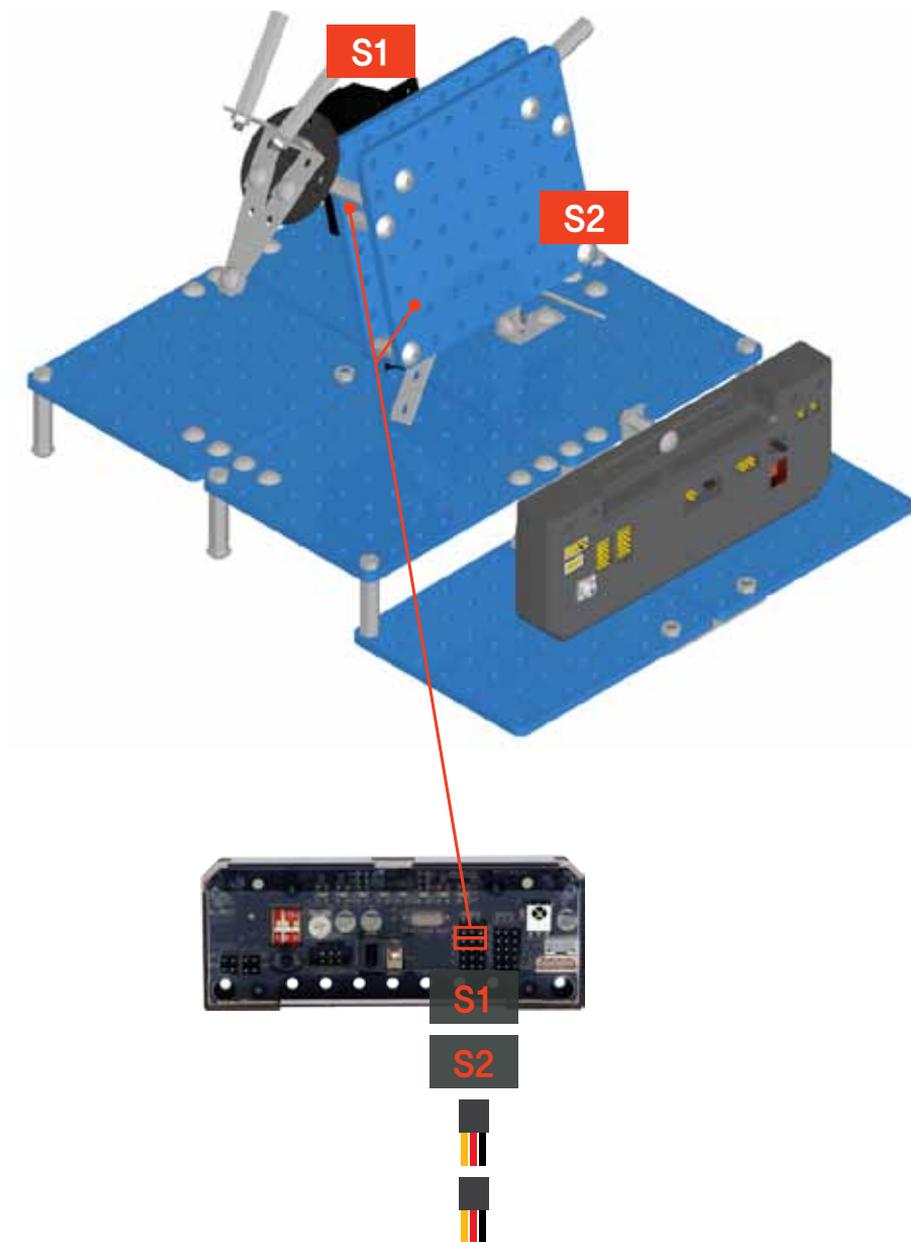
7



30mm

X 2





Scan the QR code with your  
Smart phone, and watch  
How the robot is driven.



ROBO LINK

# Acting Module

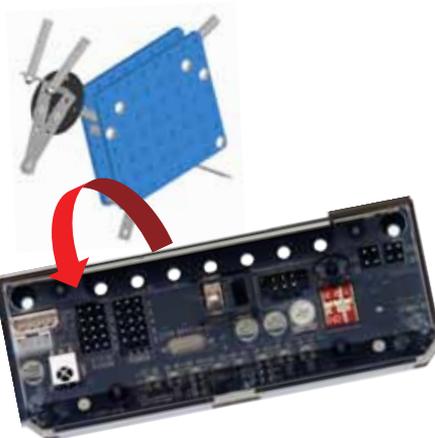


For driving Rodeo Robot, select and press program mode 4.

Rodeo Robot is a game robot, designed for balance-maintaining play in the way of leaning smart controller.



If smart controller is leaned to rightward, the Rodeo Robot also lean to rightward.



If smart controller is leaned to leftward, the Rodeo Robot also lean to leftward.

Let's try to lean smart controller toward the opposite side as smartly as can, so as to prevent Rodeo Robot from falling down to a side. The motion of Rodeo Robot gets faster as time passes, and, for that reason, it gets harder to maintain a balance.