

# Control Of Poly-Wheeled Robot On A Mobile Phone

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**Abstract:** The Omni wheeled robot consists of three Omni-wheels which are mounted at 120 degrees apart. These three wheels mounted on DC motors which will be driven by relay motor drivers that are Omni-directional motion of the robot possible with utmost ease. This robot is controlled by using mobile phone which has DTMF (Dual Tone Multiple Frequency) decoder has been provided on the robot and also this robot can be controlled by using a remote controller with wired facility. A three wheel drive with Omni-directional wheel has been tried with success, and was implemented on fast moving autonomous mobile robots. This paper deals with the DTMF mobile controller of such mobile platform, it describes the advantages and also the type of control used. Vision AVR which is a C based compiler is used for coding. The robot chassis is manufactured out of acrylic and aluminum.

**Keywords:** Omni Wheel, DTMF (Dual tone multiplefrequency) decoder, ATmega128, Relay motor.

## I. INTRODUCTION

The introduction of Omni wheeled robot is controlled by using Mobile phone with using DTMF decoder we will be learning the technologies used in the field of robotics and automation. Hands on experience of working on the DTMF.[1] along with their interfacing with a microcontroller will definitely help us in interfacing the real life systems. We are planning to implement the above project on an Atmega 128 microcontroller. Omni directional wheels have been used in robotics, in industry, and in logic-tics for many years. The main source of Omni directional wheels is companies which produce them for Omni directional conveyor systems, for example, for handling packages. Omni directional wheels are popular for Omni directional robots, especially in the Robocup setting. An Omni directional robot can drive along a straight line from point A to point B, while rotating along the line in order to arrive with the correct orientation. Omni directional wheels have also been used for wheelchairs, for service vehicles in airports, and many other applications.

- Net weight: 290g
- Load capacity: 20kg

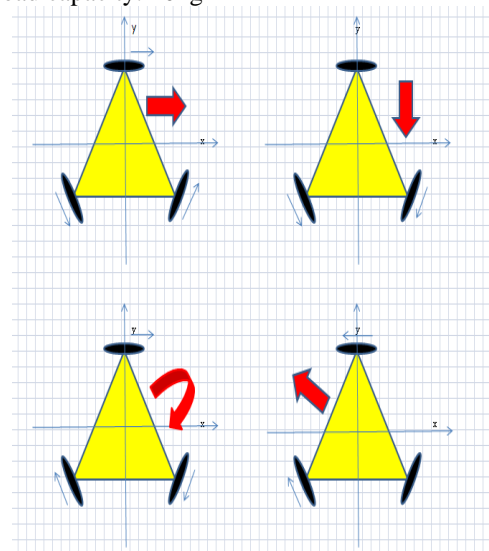


Figure1: Different Directions of Omni Wheeled Robot.

## II. OMNI WHEEL

Omni-directional wheels are unique as they are able to roll freely in two directions. It can either roll like a normal wheel or roll laterally using the wheels along its circumference. Omni-direction wheels allow a robot to convert from a non-holonomic to a holonomic robot.[2]

### Wheel Specifications

- Diameter: 100mm
- Axial width: 16mm
- Number of plates: 2
- Number of roller: 18
- Body material: Nylon
- Roller material: Rubber
- Roller bearing material: Brass tube
- Roller diameter: 19mm

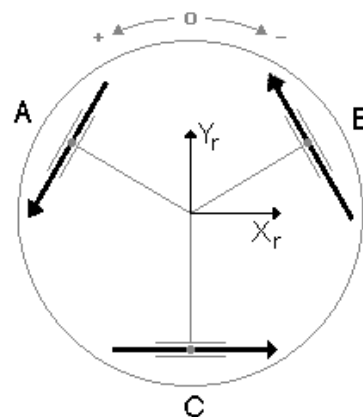


Figure2: Wheels driving axis



## V. DC MOTOR

A DC motor is any of a class of electrical machines that converts direct current electrical power into mechanical power. In this project we use simple DC motor for the rotation of the wheel which is responsible for the movement of the robot.[5] 100RPM 12V DC geared motors for robotics applications. Very easy to use and available in standard size nut and threads on shaft to easily connect and internal threaded shaft for easily connecting it to wheel. In this project 12v, 4W DC Motor is used. The Motor input power supply is taken into a nippo battery. The Motor shaft is connected across an Omni wheel.



Figure6: A Simple DC Motor.

### Features

- 100RPM 12V DC motors with Gearbox
- 3000RPM base motor
- 6mm shaft diameter with internal hole.
- 1.2kgcm torque
- No-load current = 60 mA (Max), Load current = 300 mA (Max).

- High-performance, Low-power AVR 8-bit Microcontroller.
- Advanced RISC Architecture.
- 133 Powerful Instructions – Most Single Clock Cycle Execution
- 32 x 8 General Purpose Working Registers + Peripheral Control Registers
- Fully Static Operation
- Up to 16 MIPS Throughput at 16 MHz
- On-chip 2-cycle Multiplier
- Nonvolatile Program and Data Memories
  - 128K Bytes of In-System Reprogrammable Flash
- True Read-While-Write Operation
  - 4K Bytes EEPROM
- I/O and Packages
  - 53 Programmable I/O Lines
  - 64-lead TQFP and 64-pad QFN/MLF
- Operating Voltages
  - 2.7 - 5.5V for ATmega128L
  - 4.5 - 5.5V for ATmega128
- Speed Grades
  - 0 - 8 MHz for ATmega128L0 - 8 MHz for ATmega128L
  - 0 - 16 MHz for ATmega128

## VI. ATMEGA128 MICROCONTROLLER

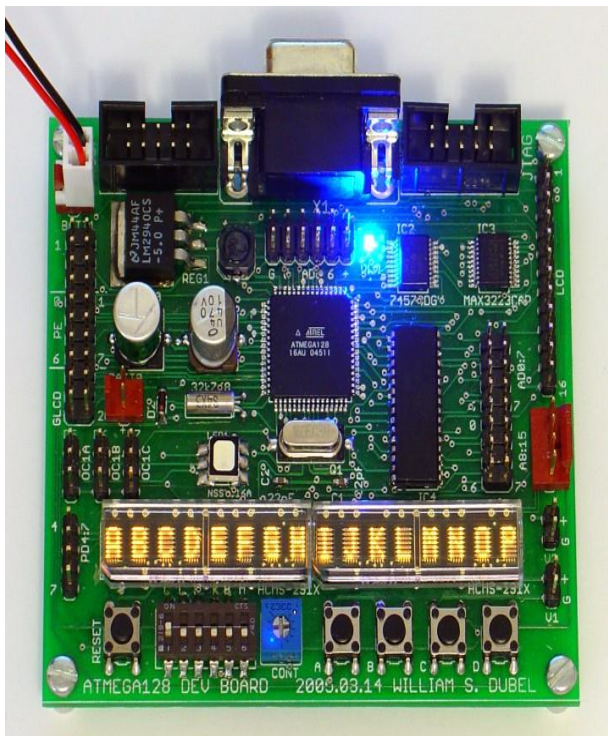


Figure7: ATMEGA 128 Microcontroller Board.