


```

// Accelerometer X
pAMS->nAccy=makeint16(buff[17],buff[18]);
// Accelerometer Y
pAMS->nAccz=makeint16(buff[19],buff[20]);
// Accelerometer Z
pAMS->nPitch=makeint16(buff[21],buff[22]);
// Pitch
pAMS->nRoll=makeint16(buff[23],buff[24]);
// Roll
return 0;
}else
return -1;}

```

IV. Experimental Research

In order to test and verify the electronic compass data acquisition system, and electronic compass data acquisition experiments are researched in this paper.

Obstacle avoidance action happens very frequently when the robot is moving on the road, so the azimuth data from electronic compass is difficult to comply with the direction of the road. In this paper the azimuth data on the straight travel without obstacle avoidance action is chosen as experimental curve of the electronic compass, as the Figure 2 shown. This experiment shows that the acquisition program can collect the azimuth data effectively and stably.

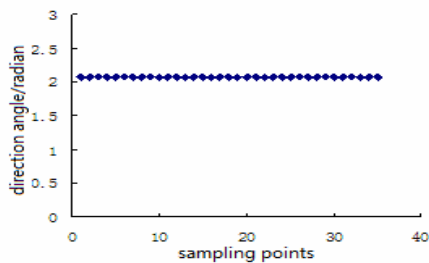


Figure 2. Data acquisition curve of the electronic compass

V. Conclusion

For the realization of the robot's autonomous mobile in a complex, dynamic and uncertain environments, a variety of sensors are used to provide all kinds of information the robot needs. Data acquisition method of electronic compass for autonomous mobile outdoor robot is studied in the paper. Data format of electronic compass is analyzed in details. Data acquisition method in Linux operating system is presented. Finally, the experimental result of the robot moving on the road independently is given, and that proved the validity of the data acquisition method.

Acknowledgment

This research is supported by Program of Science and Technology Development Plan of Jilin province of China (Grant No.: 20090122), Scientific Frontiers and Interdisciplinary Innovation Project of Jilin University of China (Grant No.: 200903309).

References

- [1] M. Yang, H. Wang, K. HE, et al, "Environmental modeling and obstacle avoidance of mobile robots based on laser radar," *Journal of Tsinghua University (Sci &Tech)*, vol. 40, no. 7, pp. 112-116, 2000.
- [2] Ouadah Nouredine, Cadenat Viviane, Lerasle Frédéric, et al, "Multi-sensor-based control strategy for initiating and maintaining interaction between a robot and a human," *Advanced Robotics*, vol. 25, no. 9-10, pp. 1249-1270, 2011.
- [3] Lin Chun-Han, King Chung-Ta, "Sensor-deployment strategies for indoor robot navigation," *IEEE Transactions on Systems, Man, and Cybernetics Part A:Systems and Humans*, vol. 40, no. 2, pp. 388-398, 2010.
- [4] Liu Gequn, Liu Weiguo, MA Dongtao, et al, "Application of Electronic Compass Module in Robot Control System," *Chinese Journal of Sensors and Actuators*, no. 3, pp. 224-227, 2004.
- [5] Hao Zhenhai, Huang Shengguo, "Integrated heading system based on differentialmagnetic compasses," *Journal of BeijingUniversity of Aeronautics and Astronautics*, vol. 34, no. 4, pp. 377-380, 2008.