

RF transmitter and receiver modules for wheelchair

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Inventions can help physically-challenged people lead life with fewer difficulties. Mohd Thamrin, Rosman R. and Sarmawi D. S. of UiTM Shah Alam Malaysia studied the use of inexpensive RF transmitters and receiver modules for wireless transmission to improve the functionality and efficiency of the manual controlled wheelchair.

Not all of us are bestowed with a pair of well-functioning [legs](#). Nonetheless, those who are physically challenged have benefited so much from the days wheelchairs were invented. Today, with the increasingly sophisticated technology, wheelchair-bound people can move more easily in robotic wheelchairs. One example of robotic wheelchairs is the advanced electric-powered wheelchairs (EPW). Unfortunately, the current state of EPW control technology does not provide adequate mobility and comfort for users.

This drawback can be improved by a User's Controller Panel (UCP) to enhance its movement. The UCP, applied to the wheelchair control mode, is the most suitable for users with lower part disability since the execution of the tasks requires hand and fingers movement. By implementing [wireless communication](#), several advantages and flexibility can be introduced to the control mode.

Since human-machine interface is an essential element in robotic wheelchair control mode, M. Thamrin N., Rosman R., and Sarmawi D. S. of UiTM Shah Alam Malaysia studied the [functionality](#) and [efficiency](#) of the manual control mode. In particular they examined the application

of inexpensive RF transmitters and receiver modules for wireless transmission.

A UCP and a model of robotic wheelchair were designed for the test. This robotic wheelchair made use of a geared DC motor mounted on each of the wheel. The basic locomotion: forward, reverse, left and right turning, was controlled by users via UCP. It implements wireless technology which allows the controller panel to be mounted on the armrest of the wheelchair or can be held by users or even can be controlled from a distance by a third party. The wireless controller panel of the robotic wheelchairs uses RF modules for data transmissions.

The findings of this study have shown that UCP is plausible to provide a better manual control mode for robotic wheelchair locomotion. The implementation of [wireless transmission](#) on the controller panel extended the manual control mode, which was conventionally mounted on the wheelchair.

Unfortunately, good things do not come cheap. Inexpensive RF transmitters and receivers are only able to handle some basic wireless communications such as sending basic instructions to the microcontroller unit (MCU) of the robotic wheelchair. RF module does have some limitations which is it can only provide one way data transfer. Extra data can only be sent by transmitter to the receiver but not the other way around. This factor limits the UCP to be used in a remote monitoring system.

In short, the results prove that cheaper RF modules are feasibility for simple-one way wireless data transfer to transmit several basic instructions to the robotic wheelchair.

The researchers recommended more sophisticated wireless communication such as wireless sensor network (WSN) and Wireless

Internet Camera Server (WICS). Such wireless communication could be implemented as the wireless monitoring system for robotic wheelchair since it transmits real-time high quality video over the Internet. This will ensure safe and accurate robotic [wheelchair](#) locomotion control especially within a confined area such as public hall or shopping mall.

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