

c-Go II Telemetric Intelligence Monitor (TiM) Elro

Insight into the status of an electric wheelchair

In many countries, thousands of people with mobility impairments use an electric wheelchair to get around, both inside and outside their homes. Users are completely dependent on the wheelchair; if it breaks down or system errors occur, they may be put at risk or unable to leave their homes.

In addition to reliability, the general quality of the wheelchair, good customer service, and the interaction with the wheelchair are important points of attention for users.

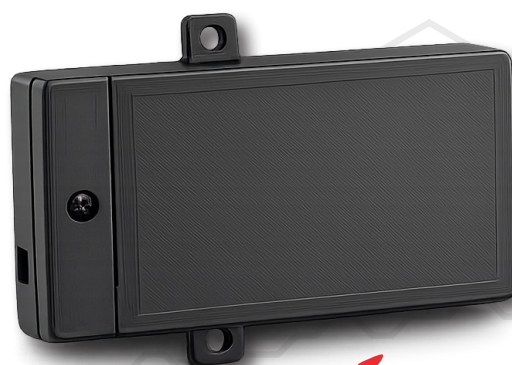
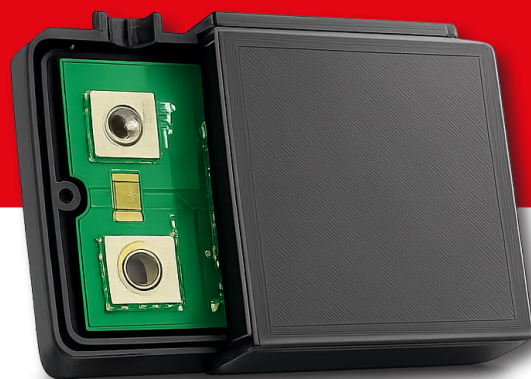
To benefit optimally from the wheelchair, it must be used correctly. For instance, variable tilt adjustment of the wheelchair can lead to a reduced risk of pressure sores and thereby prevent additional care due to complications for the user. Currently, however, care staff cannot verify whether the instructions for the wheelchair settings are being followed. The consequence may be that patients experience more discomfort than necessary.

Suppliers of medical equipment and their staff also experience problems with wheelchair maintenance or responding adequately to malfunctions. At present, there is no insight into the causes, frequency, or severity of malfunctions and defects. This is urgently needed so that preventive measures can be taken during maintenance or targeted solutions can be provided in the event of an emergency.

The Telemetric Intelligent Monitor ElRo (TiM ElRo) as an answer to the need for information

The Telemetric Intelligent Monitor for electric wheelchairs (TiM ElRo) from IVRA Electronics BV is a device that collects real-time data from the electric wheelchair. This data is transferred to a personalized dashboard.

The system sends a signal with the corresponding action. This can be preventive or concern an emergency. This system not only helps to save costs by taking preventive measures and locating the exact problem, but it also guarantees the safety of the wheelchair user.



The data that is measured and processed

The TiM collects all kinds of measurement values and processes them into a complete package of information about the wheelchair, and sends this to the server. This data concerns:

- Error messages from the wheelchair controller (such as freewheel, neutral position, battery charger connected, motor malfunction, etc.)
- Information regarding the battery pack (such as deep discharge, imbalance, charger charging current, charging factor, incomplete charges, poor XLR connection, charged/discharged capacity, voltage, current, etc.)
- Information regarding the use of the wheelchair (engagement time, collision information (maximum acceleration/ deceleration with corresponding speed), position, distance traveled, energy per km as an indication of low tire pressure, temperature, etc.)
- Changes in the wheelchair adjustments, such as tilt adjustment, backrest adjustment, height adjustment, leg rest adjustments. (These are sent immediately).]



The caregiver has access to all information via the personalized dashboard.

Use of the collected information

In principle, all information collected by the TiM Elro is used to keep the wheelchair in optimal condition. This is done in two ways: firstly, by performing more targeted and efficient vehicle maintenance. On the other hand, by helping the user treat and maintain the wheelchair in the most sustainable way.

The information in the dashboard can be used for analysis before maintenance personnel arrive on-site. The server provides information regarding, for example, a poor XLR connection, battery imbalance, increased energy consumption, or any of the error signals from the wheelchair's controller. This information can be used to determine whether early maintenance is required or what specifically needs to be replaced during routine maintenance.

The dashboard can send a direct message to the wheelchair user, for example via SMS or email. Through this message, the user can be asked to charge the battery if deep discharge is imminent. The system checks whether action will be taken in the coming days or if a reminder is needed.

The TiM Elro also offers the option to send a warning signal if a potential accident is detected in which the wheelchair tips over or if it leaves a predefined area. Finally, by measuring the tilt position of the seat, the physiotherapist or caregiver can easily check the wheelchair's seating position and provide advice to the user if necessary.