joysteer® - a highly flexible drive-by-wire steering system, designed to match the needs of disabled People.

At present, people with muscular disorders and severe physical disabilities have little opportunity to drive a car themselves. In the near future, a new electronic steering system will bring that much longed-for driving mobility, both affording them independence while offering exactly the same level of safety as any other vehicle steering system.

Whereas the automotive industry has presented a number of studies on vehicles with electronic steering (steer-by-wire) over the years, while also putting off the start of series production indefinitely, Berne University of Applied Sciences has already built a prototype of its steering system known as joysteer®. At the end of 2008, it is to be produced and marketed on a small scale with certification for use in road traffic.

The joysteer® concept is distinctly different from other known steering systems. Joystick steering works purely in electronic or electrical mode. There is no mechanical connection between the joystick and the wheels it guides. Nevertheless, the feel of normal vehicle handling, and that also means servo steering, is retained fully. The steering system has a separate joystick for each hand. The steering ratio adapts to the driving speed, allowing safe operation of the vehicle no matter what the speed range. Thanks to progressive power steering, the vehicle can be manoeuvred with minimal physical exertion. joysteer® is the only such electronic steering system to feature force feedback. Electrical drives on the joysticks generate the force that allows us to feel the wheel-to-ground contact and deliver the feedback signals vital for maintaining safe control over the vehicle.

Self designed control technology allows a high degree of flexibility in installation and for adapting to a particular disability. The joysticks can be individually adapted to the degree of mobility and strength of the disabled driver. They can even be adapted fully to any physical changes that might arise as a disease progresses.

Notwithstanding its other advantages, a new technology such as steer-by-wire is still expected to be at least as safe as existing solutions – and this safety must also be verifiable. joysteer® stands out because the design concepts and development guidelines were geared to maximum safety right from the start. The entire development process, like the product itself, is subject to the most important standard for safety-relevant electronic applications (IEC/EN/SN 61508). Compliance with this standard is voluntary and supervised by the TÜV Automotive, Munich. According to the technical report, the joysteer® concept satisfies standard ECE R79 and also IEC 61508. Force feedback, operation with both hands and variable steering ratios allow safe driving with full control in all situations. After driving the first few metres, handicapped persons can immediately tell that the vehicle handles safely and increases their individual mobility. The project joysteer® places new technologies where they are highly needed: in the service of handicapped persons.