

CAN and Windows CE

Using CAN within Windows CE - using Windows CE for CAN

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Both CAN and Windows are very successful products within their application fields: fieldbus systems versus desktop computing. Currently within CAN bus systems, MS Windows is mainly used as a user interface shell for engineering, maintenance and presentation applications. Due to the resource requirements of Windows 95 and Windows NT, the typical computers running these applications are desktop, laptop or sometimes embedded PC's. However many CAN bus nodes are build around dedicated computer systems which very often have only a limited amount of resources.

In November 1996 Microsoft introduced the Windows CE operating system on the market. It is targeted for computers like Handheld PC's, Palmtop PC's and Auto PC's, but also supports embedded computer systems. Windows CE is a sub-set of the well-known Win32 API, has a customisable kernel, can be run from non-volatile memory and is designed to support real-time applications. The Windows CE kernel follows a modular concept in order to allow downscaling of the kernel to the features supported by a specific hardware platform.

These characteristics make Windows CE an interesting operating system for a CAN node. For example: it can be used as the kernel for a dedicated embedded computer; it can be used as the operating system in a maintenance tool running on a standard Handheld PC; or it can be an easy integration method between the Auto PC and a CAN bus as used within a car.

This paper will focus on the developments undertaken by TNO-TPD to access the CAN bus from within a Windows CE environment. Typical issues which will be discussed are hardware interfacing, Windows device drivers and applications programs.

Furthermore the paper will address a CAN bus simulation environment which was developed to verify the behaviour of the (Windows CE) application programs of several CAN nodes on a single Windows NT computer. This simulation environment uses the multitasking features of Windows to run the CAN application programs in parallel and it provides a 'virtual' CAN bus to the applications.

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