

Application Note

No. 13

- Product:** Softing CAN Layer2 API
- Keywords:** CAN, CAN Layer 2 API, CAN driver, Wrapper DLL
- Problem:** Compatibility of CAN Layer 2 API versions 4.xx and 5.xx

Will an application that was built with CAN Layer2 API version 4.xx work with the new version 5.xx?

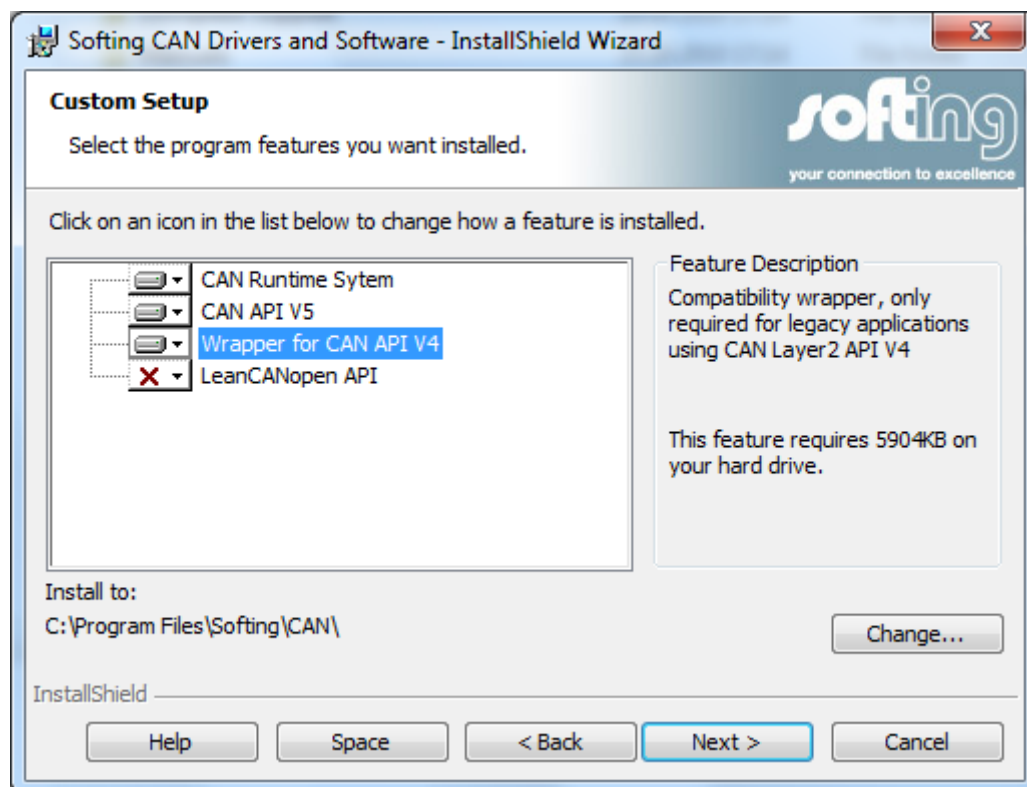
From version 4.xx of the CAN Layer2 API to version 5.xx the names of the API functions have changed. Therefore, applications based on version 4.xx are not able to use API version 5.xx directly. They need a Wrapper DLL mapping the functions of version 4.xx to functions of version 5.xx.

From the application's point of view the Wrapper DLL behaves exactly like the API DLL of version 4.xx. The Wrapper DLL implements the functions of version 4.xx by calling functions of version 5.xx. For that reason the Wrapper DLL needs the API DLL version 5.xx.

The Wrapper DLL uses the same name as the former version 4.xx API DLL. (e. g. canacpci.dll for the CAN-ACx-PCI interface board)

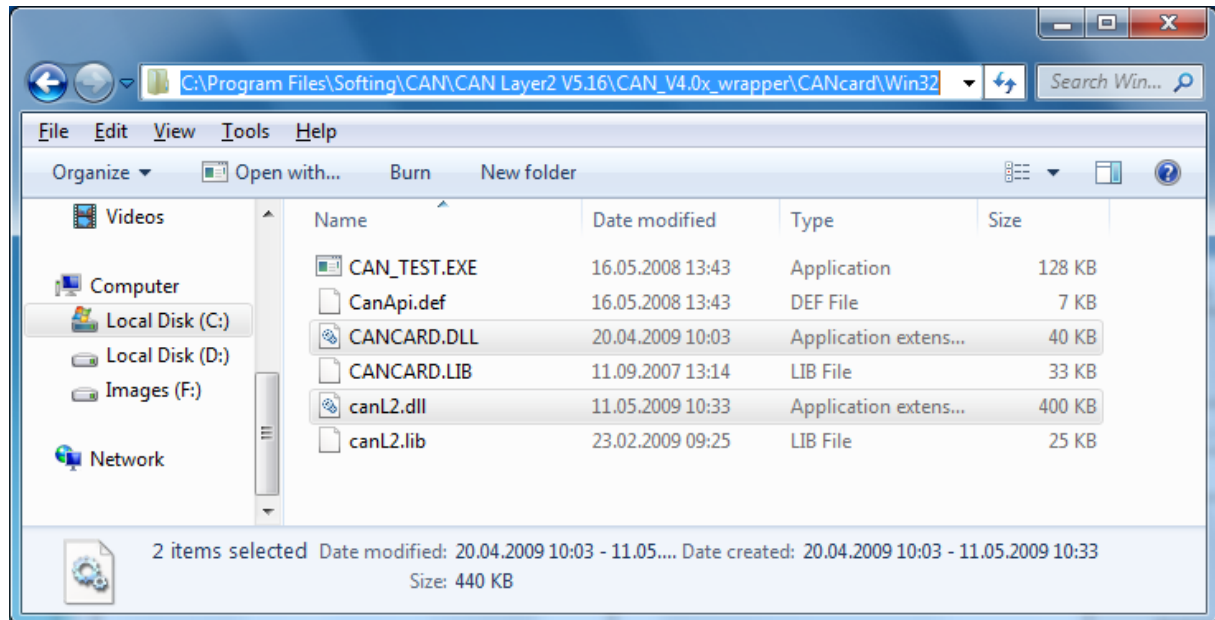
Installation:

The current can driver installation package contains the Wrapper DLLs as optional component. By default, the Wrapper DLLs are not installed. If you need the Wrapper DLLs, please select option "Wrapper for CAN API V4" during installation.



After the installation you can find corresponding Wrapper DLLs in the folder:
C:\Program Files\Softing\CAN\CAN Layer2 V5.16\CAN_V4.0x_wrapper\<Interface Board>Win32

Please copy all DLLs from that folder to the project folder of your application.



Restrictions of the Wrapper DLL:

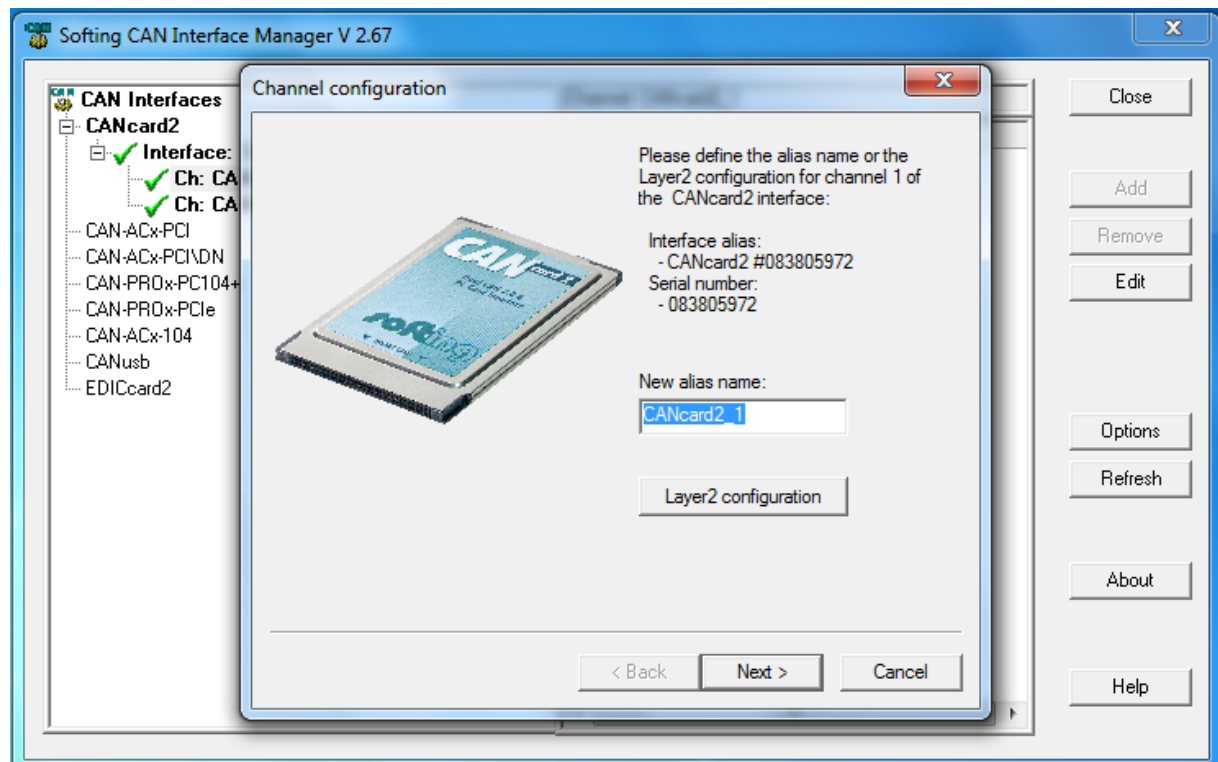
- The Wrapper DLL is not suitable for multi-board-operation. This is true also for the former workaround using explicitly linked copies of the DLL. In particular with multi-board-operation we recommend switching to the V5.xx API which offers specific support for that purpose.
- CAN-ACx (ISA), CANcard NEC, CANcard SJA and EDICcard C are not supported. The Wrapper DLL only works with boards that are supported by API V5.xx. All supported CAN Interface boards are shown in the **Softing CAN Interface Manager (SCIM)**.
- With dual channel boards the time stamps are sorted chronologically per channel and not globally for the entire board. Each channel works independently from the other.
- Like the API V4.xx the Wrapper DLL is not re-entrant.

Improvements and extensions of version 5.xx compared to version 4.xx:

- With version 4.xx there was only one receive and one transmit FIFO for both channels of a dual channel CAN interface board. With version 5.xx each channel has its own FIFOs. Each channel can work independently from the other. Errors during transmission or reception on one channel do not block the other channel.
- Using more than one CAN interface board required copying the DLL, loading the individual files separately and saving the API functions to function pointers. This was quite inconvenient. In version 5.xx you open a channel by its name and get a channel handle. This handle is used by all other API functions as a parameter selecting the desired channel.
- With version 4.xx the interface board was identified by its slot number. This mechanism often failed because the operating system did not assign the correct number. With version 5.xx a channel is identified unambiguously by its name.
- With version 4.xx it was not possible to (re-) initialize the individual channels separately. The other channel on the same board was always initialized in parallel. With version 5.xx the individual channels of a board can be initialized independently.
- With version 5.xx it is possible to use the two channels of a board from two different applications.

- Version 5.xx contains a .NET-API.
- Only with Version 5.xx FIFO mode and Dynamic Object Buffer mode can be chosen individually for each channel of a board,
- The API of version 4.xx was not re-entrant. If more than one thread used the API, you needed to take care (by mutex, semaphore or critical section), that two threads never used the same API function at the same time. Version 5.xx is re-entrant.
- Version 5.xx makes it easy to gather information about all boards available in the system.
- With version 4.xx there was no tool that allowed configuring the bus parameters of the interface boards. The settings for the baud rate of the CAN controller needed to be calculated manually, based on the controller's clock frequency. Version 5.xx offers the option to simply set the baudrate in the Softing CAN Interface Manager. Matching configurations for the CAN controller are computed automatically:

Select the desired channel and change the channel configuration by clicking on "Edit". In the first dialog box click on "Layer2 configuration". In the next dialog box you will see a list of possible values for the CAN controller matching the selected baud rate. A fitting configuration is copied to the baudrate parameters automatically. You can choose a combination from the list and / or adjust individual parameters manually. Each time you specify the baudrate a list showing possible settings is calculated.



CAN Layer2 configuration for channel "CANcard2_1"

Baudrate settings

Baudrate [kBaud]

TSEG1

TSEG2

Prescaler

SJW

Samples

f(CAN) [MHz]

Filter Settings

Acceptance Mask

Acceptance Code

Acc. Mask XTD

Acc. Code XTD

Output Control Register

Output Control

Additional Features

confirm successful transmission

enable error frame detection

Possible CAN controller settings for 500.00 kBaud

Baudrate	Prescaler	TSEG1	TSEG2	SJW	Samples	SPL[%]
500.00	1	8	7	1	1	56
500.00	1	8	7	2	1	56
500.00	1	8	7	3	1	56
500.00	1	8	7	4	1	56
500.00	1	9	6	1	1	63
500.00	1	9	6	2	1	63
500.00	1	9	6	3	1	63
500.00	1	9	6	4	1	63
500.00	1	10	5	1	1	69