

DN-PC104/331

PC/104-DeviceNet-Interface

Hardware Installation and Technical Data

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Changes in the Chapters

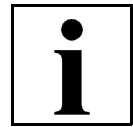
The changes in the user's manual listed below affect changes in the **hardware**, as well as changes in the **description** of the facts only.

Chapter	Alterations with respect to previous version
-	First English version.
-	-

Further technical changes are subject to change without notice.

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1. Overview

1.1 Module Description

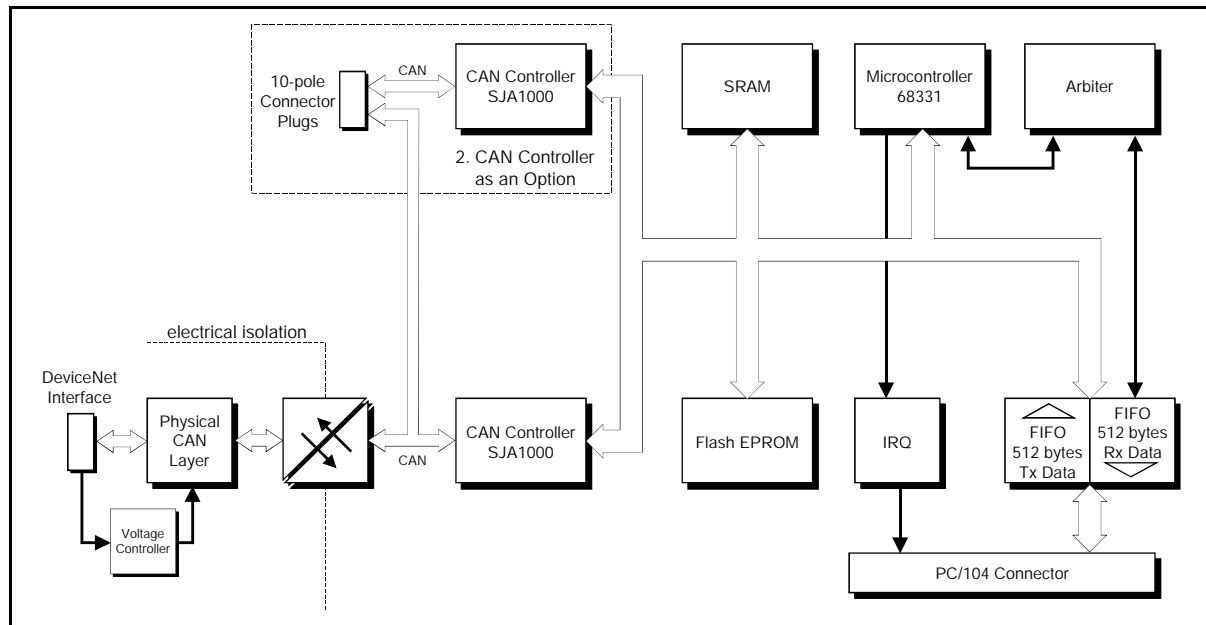
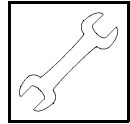


Fig. 1.1.1: Block-circuit diagram of the DN-PC104/331 module

The DN-PC104/331 board is designed for the PC/104-bus (PC/104 16 bits). It uses a 68331 microcontroller, which cares for the local management. The DeviceNet data is buffered in a local SRAM. Security and consistency of data is guaranteed up to 1 Mbit/s.

The DeviceNet compliant interface allows a data-transfer rate of a maximum of 1 Mbit/s. Among many other features, the bitrate can be set by software.

The DeviceNet interface is electrically separated from other voltage potentials by means of optocouplers.



2. Hardware Installation

2.1 Before Starting Hardware Installation

During the hardware installation it may be necessary to change the PC104-I/O-port address. The default address is **1E0...1E7** HEX. The DeviceNet module covers 8 data bytes. Furthermore it is necessary to set the interrupt during the following software installation.

Make sure that there will be no address conflict with other boards of the PC/104-system and that there will be no conflict with other interrupts!

Note for Windows 95 Users:

If you use a Windows 95 operating system **first read the software installation guide** in the appendix of the manual 'CAN API, Monitor Program CAN-Scope and Installation' and then start with the installation sequence!

2.2 Execute Hardware Installation and Setting of PC/104-Bus Address

The DN-PC104 module can be used in all PC/104-compatible 16-bit systems (e.g. portable industry PCs or installed control systems). The carrier system will therefore be described by the general term 'computer' below.

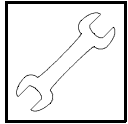
Attention !

Electro static discharge may cause damage to electronic devices. To avoid this, first do the following steps to discharge your personal static electricity, *before* you touch the DeviceNet module:

- @ Switch off the power supply of all units but leave the connector plug in the socket.
- @ Then touch the computer's metal case to discharge the static electricity.
- @ Even your clothes must not touch the DeviceNet module!

1. Switch off the computer and all connected peripheral devices (monitor, printer, ...). Switch off the other DeviceNet participants to that the PC104 module is to be connected.
2. Discharge yourself as described above if not yet done.

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Installation

3. Disconnect the computer from mains by removing the mains connector.
If the computer does not have a flexible mains lead but is fixed to the mains, disconnect the supply voltage via the safety fuse and protect the fuse from switching on again unintentionally.
4. Remove the computers cover
5. Select a position in the PC/104-bus stack.
There are no restrictions in choosing a position in the stack for this module as long as there are only 16-bit modules between it and the CPU.
6. Have you made sure that there will be no address conflict with other PC/104 boards? (See chapter '2.2.1 Before Starting Hardware Installation' above.)
If you have to change the address of the board, go on with step 7 otherwise go on with step 8.
7. Setting the PC/104-bus-I/O-port address
The address is set via the DIL switch S100. Its position can be taken from figure 1.2.1 on page 4.
If a coding switch is set to 'OFF', the according address is evaluated as '1'. If it set to 'ON', the according address is evaluated as '0'.

Coding switch:	1	2	3	4	5	6	7	8	ON
	"	"	"	"	"	"	"	"	•
PC/104-port address:	A9	A8	A7	A6	A5	A4	A3	--	—
									OFF

Fig. 2.2.1: DIL switch S100

The hardware address has to be given to the driver during the software installation. The menu of the Windows NT installation program e.g. offers a choice of the following addresses:

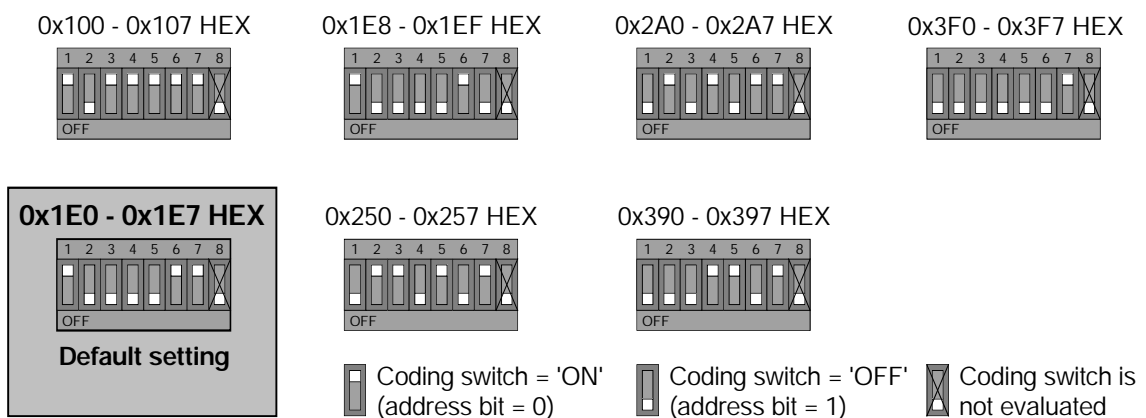
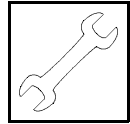


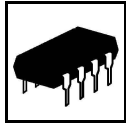
Fig. 2.2.2: Default setting of coding switches and choices of addresses supported by Windows NT driver

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Note: The Windows NT installation program does not support any other coding switch positions.

8. Install the DeviceNet module at the selected PC/104-stack position.
9. Close the computers case.
10. Connect the DeviceNet.
Please note that the DeviceNet has to be terminated at both ends by resistors. Consult the DeviceNet Specification for the correct wiring of the net.
11. Connect the power supply of the computer (mains connector or fuse).
12. Switch on the power supply of the computer, the peripheral devices and the other DeviceNet participants.
13. End of hardware installation.
Continue with software installation.



3. Summary of Technical Data

3.1 General Technical Data

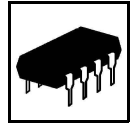
Ambient temperature	0...50EC
Humidity	max. 90%, non-condensing
Supply voltage	via PC/104-bus, nominal voltage: 5 V \pm 5%, current (max., at 20EC): 0.55 A
Plug-and-socket connectors	X100 (64-pole PC/104 PCB connector) - PC/104 bus X101 (40-pole PC/104 PCB connector) - PC/104 bus X400 (MSTB2,5/-GF-5,08) - DeviceNet interface X402 (10-pole male connector) - optional CAN-TTL signals The following connectors are only equipped for programming and service: X200 (4-pole female con.) - CPU interface (serial, TTL) X201 (10-pole male connector) - BDM interface X501 (5-pole male con.) - ISP programming
Dimensions	95.9 mm x 90.2 mm
Weight	< 300 g

Table 3.1.1: General module data

3.2 PC/104 Bus

Host bus	PC/104
PC/104-data bus	16 bit
Interface	IN/OUT-FIFOs (512 bytes each)
Interrupt	1 out of 12
Stack position	no restrictions in position in stack (Attention: No 8-bit-modules between DN-PC104 and PC/104-CPU !)
Connectors	PC/104 PCB connectors, 40-pole and 64-pole

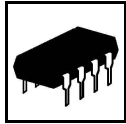
Table 3.2.1: PC/104-bus data



3.3 DeviceNet Interface

Number of interfaces	1, option: 2 interfaces
CAN controller	SJA1000
CAN protocol	basic-CAN 2.0A/B
Physical interface	according to DeviceNet specification 'DeviceNet Communication Model and Protocol, Rel. 2.0'
Bus termination	has to be set externally
Electrical separation of DeviceNet interface from other units	by optocouplers
DeviceNet connector	Phoenix Combicon style connector MSTB2,5/-GF-5,08 or equivalent
DeviceNet adapter option	one or two adapter boards with Phoenix Combicon style connector for installation in case panel

Table 3.3.1: DeviceNet interface data

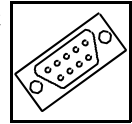


3.4 Order Information

Type	Properties	Order no.
DN-PC104/331-1	DN-PC104 board with one DeviceNet interface on board, local DeviceNet firmware	C.2014.02
DN-PC104/331-1E	DN-PC104 board with one DeviceNet interface at external adaptor board for fixing at case panel, local DeviceNet firmware	C.2014.07
DN-PC104/331-2E	DN-PC104 board with two DeviceNet channels, both wired to interfaces at external adaptor boards, local DeviceNet firmware	C.2014.08
Options:		
DN-PC104/331-NT	Windows NT Device driver	C.2014.11
DN-PC104/331-VxW	VxWorks driver for PC: object licence	C.2014.55
DN-PC104/331-VxW	VxWorks driver for PC: source code	C.2014.58
DN-PC104-ME *)	English manual for C.2014.02 ... C.2014.08 and C.2014.55, C.2014.58	C.2014.21
CAN-API-ME *)	English manual for C.2012.11	C.2001.21

*) If order together with the module, the manual will be delivered free of charge.

Table 3.5.1: Order information



4. Connector Assignment

4.1 DeviceNet

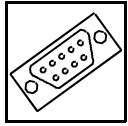
The DeviceNet interface is designed according to the specification ‘DeviceNet Communication Model and Protocol, Release. 2.0’. The power supply of the CAN bus driver has to be supported from external and the wiring is done by Phoenix Combicon style connectors MSTB 2.5/-GF-5.08 (or equivalent).

Pin Assignment:

Pin	Signal
1	V-
2	CAN-
3	Shield
4	CAN+
5	V+

Signal Description:

V+...	power supply for CAN interface ($U_{VCC} = 24 \text{ V} \pm 4\%$)
V-...	reference GND for V+ and CAN+/CAN-
CAN+, CAN-...	CAN signals
Shield...	shield signal (not connected)



Connector Assignment

4.2 CAN-TTL Signals (X402)

The two CAN channels can be wired to two adapter boards via X402. Each adapter board offers one DeviceNet connector. The adapter boards are designed for fixing at the case panel.

Connector X402 carries the Rx/Tx-signals of the CAN controller. The signals are on TTL level and are not electrically separated from the microcontroller units!

Signal name	Pin		Signal name
+5V	1	2	Tx00*
Tx01*	3	4	Rx00*
Rx01*	5	6	Tx10*
Tx11*	7	8	Rx10*
Rx11*	9	10	GND

The DN-PC104/331-adaptor board version includes the DN-PC104/331-board, the DeviceNet adapter board, the ribbon cable, the fixing brackets and all necessary bolts, screws and washers.

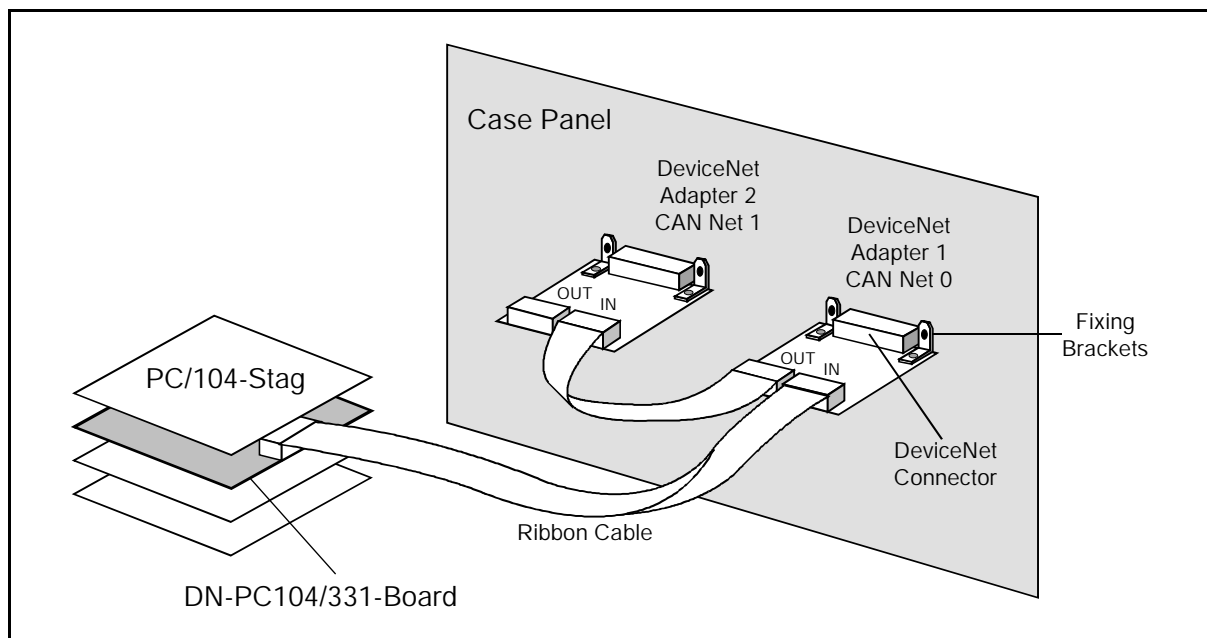


Fig. 4.2.1: Wiring of the adapter boards