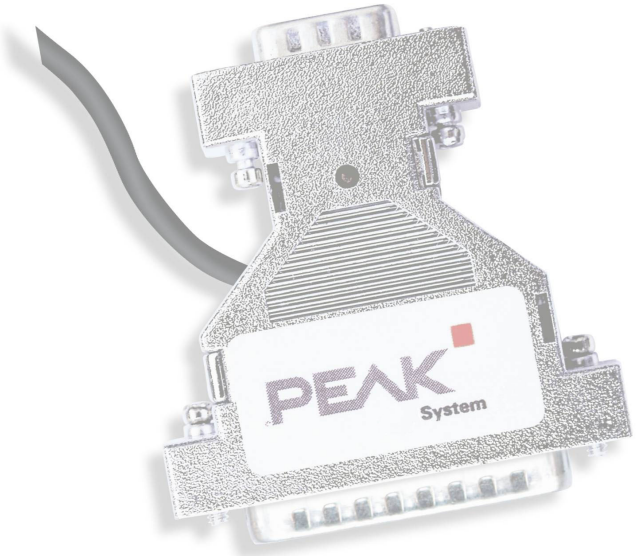
PCAN-Dongle (ISO)

Adapter PC Parallel Port
to High-speed CAN

User Manual



PEAK System

Products taken into account

Product Name	Model	Item Number
PCAN-Dongle	PS/2	IPEH-002019
PCAN-Dongle ISO	PS/2	IPEH-002020
PCAN-Dongle	DIN	IPEH-002015

Windows® and MS-DOS are registered trademarks of Microsoft Corporation in the United States and other countries.
All other product names mentioned herein may be the trademarks or registered trademarks of their respective companies. Furthermore, "™" and "®" are not mentioned in each case in this manual.

© 2006 PEAK-System Technik GmbH

PEAK-System Technik GmbH
Otto-Roehm-Strasse 69
D-64293 Darmstadt
Germany

Phone: +49 (0)6151-8173-20
Fax: +49 (0)6151-8173-29

www.peak-system.com
info@peak-system.com

Release date: May 3, 2006

Contents

1 Introduction 4

1.1 Properties at a Glance 4
1.2 System Requirements 5
1.3 Scope of Supply 5

2 Hardware Installation 6

2.1 Connecting to the PC 6
2.2 Connecting a HS-CAN 7
2.3 5-Volt Supply at the CAN Connector 7

3 Software Setup 10

3.1 Windows Operating Systems 10
3.2 DOS and Relatives 11

4 Use 12

4.1 Getting Started under Windows 13
4.2 Getting Started under DOS 15

5 Linking Own Programs with PCAN-Light 18

6 Frequently Asked Questions (FAQ) 19

7 Technical Specifications 20

Appendix A Certificates 21

A.1 CE 21

Appendix B Quick Reference 23

1 Introduction

Tip: At the end of this manual (Appendix B) you can find a **Quick Reference** with brief information about the installation and operation of the PCAN-Dongle.

The PCAN-Dongle allows the connection of a CAN bus to the parallel interface of an IBM compatible PC. It is especially suitable for use with notebook computers since these usually don't have an ISA or PCI slot. With the help of this adapter any PC can be linked to a High-speed CAN (HS-CAN).

The so-called ISO version of the PCAN-Dongle additionally contains a galvanic isolation. An isolation of up to 500 V between the PC and the CAN parts of the adapter is achieved by use of a DC/DC converter and an optocoupler.

Note: This manual refers to both the **PCAN-Dongle** standard version and the **PCAN-Dongle ISO** with galvanic isolation. Differences at use and at the technical specifications are mentioned accordingly in this manual.

1.1 Properties at a Glance

- Connection of a High-speed CAN (CAN specifications 2.0A and 2.0B) to a PC
- Use of a PC's parallel port capable of interrupts
- Supports all interrupt and port address settings for the parallel interface
- Supports the standard and the ECP mode of a parallel interface
- Equipped with the CAN controller SJA1000T by Philips
- CAN transfer rate up to 1 MBit/s

- CAN connection 9-pin Sub-D male, pin assignment according to CiA recommendation DS102
- Galvanic isolation up to 500 V for the CAN interface (only PCAN-Dongle ISO)
- Power supply (5 V) via cable with T-piece for keyboard connector (DIN or PS/2)
- Support for operating systems Windows (98 SE, ME, 2000 SP4, XP), Linux, and DOS

Note: This manual describes the use of the PCAN-Dongle with Windows and DOS. You can find device drivers for Linux and the corresponding information on PEAK-System's website under http://www.peak-system.com/linux.

1.2 System Requirements

The following prerequisites must be given, so that the PCAN-Dongle can be used properly:

- An empty parallel port (Sub-D, 25 pins) at the PC, capable of interrupts
- Operating system Windows (98 SE, ME, 2000 SP4, XP), Linux, or DOS

1.3 Scope of Supply

The scope of supply normally consists of the following parts:

- Adapter PCAN-Dongle (case with two ports and a cable with T-piece for DIN or PS/2 keyboard connector)
- CD-ROM with software (drivers, utilities), programming examples, and documentation

2 Hardware Installation

2.1 Connecting to the PC

1. Make sure that the PC is turned off.
2. Connect the PCAN-Dongle with the wider port (25 pins) to the free parallel port at the PC.
3. Pull the keyboard connector from the corresponding port at the PC.
4. Connect the T-piece at the cable of the PCAN-Dongle to the keyboard port.
5. Now reconnect the keyboard to the free end of the T-piece.

A configuration of the hardware is not needed. However, you should check the settings for the parallel interface in the PC's **BIOS setup**.

If the PC has a parallel interface with EPP as well as ECP properties, the corresponding setting in the BIOS set-up should be "ECP" (not "EPP" and not "EPP+ECP"). Although the extended properties of the PCAN-Dongle usually will work with the last-mentioned setting some systems may have problems with it. Therefore the setting for the "pure" ECP mode should be preferred.

Further information about the different operating modes of the PCAN-Dongle can be found in chapter 4 *Use*.

First Test

After turning on the PC the red LED at the PCAN-Dongle must be permanently on. This indicates that the power supply for the PCAN-Dongle is correct.

Attention! Don't remove PCAN-Dongle from the PC while powered on (red LED on PCAN-Dongle is lit). Electronic parts of the PCAN-Dongle or the PC's parallel interface may be harmed.

2.2 Connecting a HS-CAN

A CAN is connected to the 9-pin Sub-D port on the PCAN-Dongle. The pin assignment corresponds to the CiA recommendation DS 102-1.

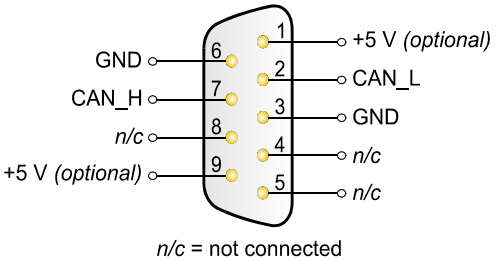


Figure 1: Pin assignment HS-CAN
(view onto male connector of the PCAN-Dongle)

2.3 5-Volt Supply at the CAN Connector

A 5-Volt supply can optionally be routed to pin 1 and/or pin 9 of the CAN connector (PCAN-Dongle ISO: pin 1 only) by setting solder bridges on the PCAN-Dongle PCB (Dongle case opened). Thus devices with low power consumption (external transceivers or optocouplers, for example) can be directly supplied via the CAN connector.

When using this option, the 5-Volt supply is directly connected to the power supply of the PCAN-Dongle (coming from the PC) and is not fused separately. The ISO version of the Dongle contains an interconnected DC/DC converter. Therefore the current output is limited to about 50 mA.

Attention! At this procedure a special care is indispensable since there is a short circuit danger. The PCAN-Dongle could be destroyed and/or the power supply or electronics of the PC or other components connected could be damaged.

Important note: PEAK-System Technik GmbH does not give guarantee on damages which have resulted from application of the option described in this section.

Procedure:

1. In order to access the PCB, open the case of the PCAN-Dongle by cautiously levering the latches on both sides (risk of breakage!), e.g. with a flat tip screwdriver.
2. Set the solder bridges on the PCAN-Dongle PCB according to the desired settings. Figure 2 and Figure 3 show the possible positions of a solder bridge.

+5 Volts at the CAN connector:

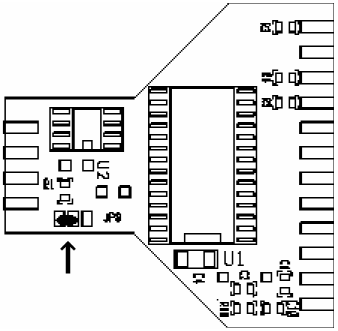


Figure 2:
PCB PCAN-Dongle (bottom side):
JP9, 2-1 (as shown) → pin 1
JP9, 2-3 → pin 9

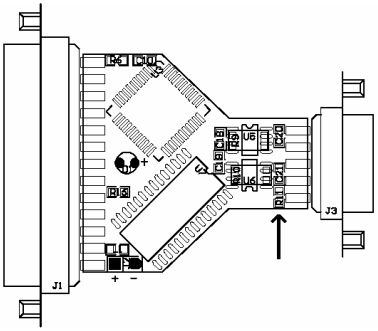


Figure 3:
PCB PCAN-Dongle ISO (top side):
Pos. R11 bridged → pin 1

3. For reassembly place the PCB overhead onto the top part of the case. Make sure that the cable is lying in the side cut-out with the strain relief inside the case, and that the LED is placed in the corresponding hole of the top part of the case.
4. Push the bottom part of the case onto the top part (the latches click in).

3 Software Setup

This chapter describes the installation of the delivered software. You get to know more about its use in the following chapter 4.

3.1 Windows Operating Systems

Under Windows a driver is needed that can access the PCAN-Dongle and that provides the interface for Windows software. Beside the mentioned device driver the CAN monitor PCAN-View for Windows can also set up.

Note: The following instructions are valid only for Windows 2000 and Windows XP. If you use the operating systems Windows 98 SE or Windows ME, please contact the customer support (address: see page 2).

Do the following to setup the driver and, if applicable, additional software:

1. Please make sure that you are logged in as user with administrator privileges (not needed for normal use of the PCAN-Dongle later on).
2. Insert the supplied CD-ROM into the PC. Usually a navigation program appears a few moments later. If not, start the file `Intro.exe` from the root directory of the CD-ROM.
3. Navigate through the menus to the driver installation for the PCAN-Dongle (**English** > **Drivers** > **PCAN-Dongle**). Click on **Install now** afterwards. The setup program for the driver is executed.
4. Follow the instructions of the setup program.

3.2 DOS and Relatives

You can find the CAN monitor PCAN-View for DOS and the programming samples in C and Pascal on the supplied CD-ROM in the following directories:

PCAN-View for DOS:
`\Tools\PcanView\Dos`

Programming samples:
`\Develop\Dos\Dongle`

A separate setup procedure isn't needed.

4 Use

The PCAN-Dongle can be used in one of four possible operating modes:

Name of Operating Mode	Alternative Identifier	Description
Multiplex Mode	PEAK Dongle-CAN	Standard Parallel Port (SPP)
EPP Mode	PEAK Dongle-CAN EPP	Extended Capability Port (ECP)
Multiplex PeliCAN Mode	PEAK Dongle-CAN SJA	Standard Parallel Port (SPP), extended CAN functionality (CAN 2.0B incl. 29-bit IDs)
EPP PeliCAN Mode	PEAK Dongle-CAN SJA EPP	Extended Capability Port (ECP), extended CAN functionality (CAN 2.0B incl. 29-bit IDs)

The EPP PeliCAN Mode is recommended to gain the full CAN functionality at lowest possible PC system load. If this mode doesn't work correctly, you can fall back to one of the other operating modes. The Multiplex Mode should work on any system.

Tip: You can find further information about the PeliCAN Mode in the data sheet for the CAN controller SJA1000 by Philips obtainable at the according website, for example.

You can find information about activating an operating mode in the following sections.

4.1 Getting Started under Windows

4.1.1 Information about the Parallel Interface

You need information about the used interrupt and port address of the parallel interface. It can be gained from the Device Manager of Windows:

1. On the desktop open the context menu of the icon "My Computer" (right mouse click) and select the command **Properties**.
2. Windows 2000, XP: Select the tab **Hardware** and click on the button **Device Manager** afterwards.
   Windows 98 SE, ME: Select the tab **Device Manager**.
3. Under **Ports (COM & LPT)** in the tree view double click on the entry **Printer Port (LPTx**) or ECP Printer Port (LPTx).
4. Select the tab **Resources**.

You can extract the needed information from the entries "Input/Output Range" and "Interrupt Request" in the shown list. Write down this information for later use.

Note: Under Windows 2000 and Windows XP the use of an interrupt for the parallel interface must explicitly be determined. This happens on the tab **Port Settings**. Activate the option **Use any interrupt assigned to the port** there.

4.1.2 PCAN-View for Windows

In the Start menu of the Windows desktop you can find the entry "PCAN Hardware". From there you can execute the program PCAN-View.

A dialog for the selection of the CAN hardware as well as the setting of the CAN parameters appears after the program start.

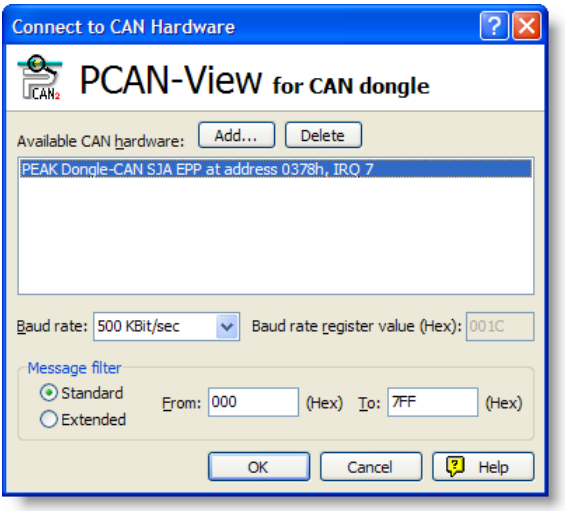


Figure 4: Selection of the CAN specific parameters

If **no entry** is in the list "Available CAN hardware" (for example at the first program start), you need to add one:

1. Press the button **Add**. The dialog box "Add CAN hardware" appears.
2. Select the connected hardware and the operating mode from the list "Type of CAN hardware". If the mode of the parallel interface is set to ECP in the PC's BIOS setup, you can register the PCAN-Dongle as "PEAK Dongle-CAN SJA EPP".

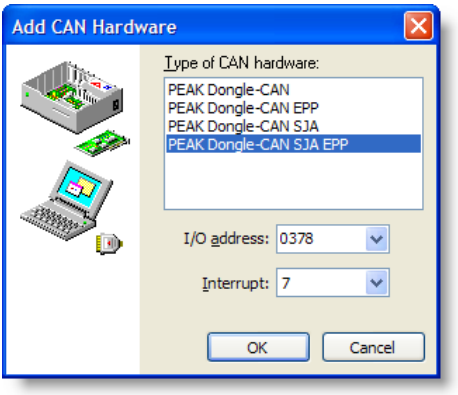


Figure 5: Selection of hardware resources

3. Enter the port address and the interrupt of the used parallel interface established before (see section above).
4. Confirm your input with **OK**.

In the dialog box "Connect to CAN hardware" make **further settings** (baud rate and CAN message filter) for the created hardware entry.

If you need further help after the program start, use the online help provided with the program (key [F1]).

4.2 Getting Started under DOS

4.2.1 Information about the Parallel Interface

You need information about the used interrupt and port address of the parallel interface. It can be determined with the MS-DOS tool MSD (`MSD.EXE` in the DOS directory).
The following table gives an overview of the common port addresses and interrupts for the parallel port at the PC.

Port	Address	Interrupt
LPT1	0x378	IRQ7
LPT2	0x278	IRQ5
LPT3	0x3BC	IRQ5/7

4.2.2 PCAN-View for DOS

The program PCAN-View for DOS enclosed in the package is a CAN monitor that supports various SJA1000/82C200 based PC hardware extensions by PEAK-System. It is able to transmit and receive CAN messages. As software with basic features it represents the Light version of CANMON for DOS. With PCAN-View for DOS you can examine existing nets and set up new ones.

Note: On PCs with processors with a clock frequency greater than 400 MHz you should only use program versions > 3.0.

Program Initialization

1. Execute PCAN-View for DOS (file `PCANVIEW.EXE`).
2. Enter the port address and the interrupt of the parallel interface.
3. Select the desired baud rate.
4. From the list of operating modes select one of those beginning with "PEAK Dongle".
   If your PC has an ECP interface and the corresponding function is activated in the BIOS setup, you can use one of the operating modes ending with "EPP". If you have problems with these operating modes, select "PEAK Dongle-CAN" instead.
5. By pressing [F10] the PCAN-Dongle is configured and linked to the CAN.

If the error message "CAN Controller 82C200 not found" is displayed, then double-check the used interrupt and port address as well as the selected hardware type.

You can access the online help any time by pressing [F1].

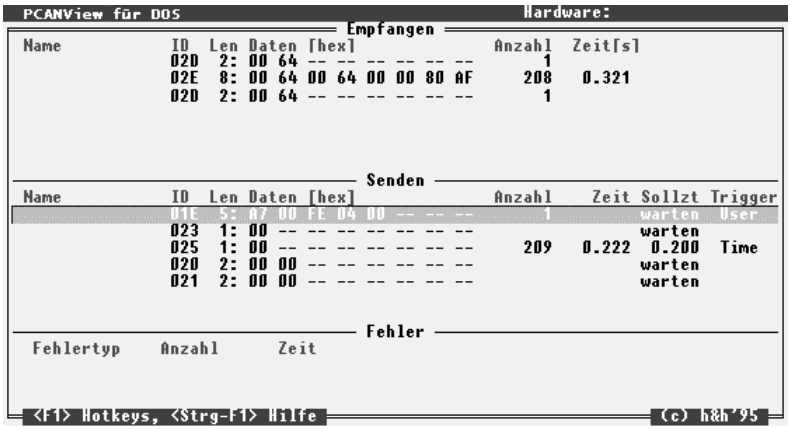


Figure 6: Screenshot PCAN-View for DOS

5 Linking Own Programs with PCAN-Light

On the supplied CD-ROM you can find files that are provided for software development. You can access them with the navigation program (button **Programming**). The files exclusively serve the linking of own programs to hardware by PEAK-System with the help of the installed device driver under Windows.

Further more the CD-ROM contains header files and examples for creating own applications in conjunction with the Light drivers. Please read the detailed documentation of the interface (API) in each header file.

Tip: You can find further information in the file `PCANLight_enu.chm` (Windows Help file) on the CD-ROM.

Notes about the License

Device drivers, the interface DLL and further files needed for linking are property of the PEAK-System Technik GmbH (PEAK-System) and may be used only in connection with a hardware component purchased from PEAK-System or one of its partners. If a CAN hardware component of third party suppliers should be compatible to one of PEAK-System, then you are not allowed to use or to pass on the driver software of PEAK-System.

PEAK-System assumes no liability and no support for the PCAN-Light driver software and the necessary interface files. If third party suppliers develop software based on the PCAN Light driver and problems occur during use of this software, please, consult the software provider. To obtain development support, you need to own a PCAN Developer or PCAN Evaluation version.

6 Frequently Asked Questions (FAQ)

Question	Answer
In the PC's BIOS setup the parallel port setting shows **ECP** but the PCAN-Dongle works with the **EPP** mode. Is this correct?	Yes, it is. The naming of the operating mode EPP of the PCAN-Dongle has historical causes. The parallel interface at the PC went through various developments in the nineties. Only the EPP extension existed during the time, when the PCAN-Dongle arose. With version 1.9 the EPP extension already had similarities to the ECP extension, which is usually used in PCs today. The name of the operating mode EPP was kept for the PCAN-Dongle.
Can a **printer** still be connected to the PCAN-Dongle?	No. The PCAN-Dongle doesn't offer any possibility to connect through the parallel interface for the printer. The PCAN-Dongle Pro, having this functionality integrated, isn't sold by PEAK-System anymore.
Is it possible to **supply** the PCAN-Dongle PS/2 also via the computer's **mouse connector**?	Yes.
I have problems running the PCAN-Dongle under **Windows 2000/XP**.	The driver files PEAKCAN.SYS and PCAN_DNG.SYS must be available at least in version 2.30. You can determine the currently used driver version e.g. with the About dialog box in PCAN-View (menu command **Help** | **About**).

7 Technical Specifications

Supply	
Supply voltage	+5 V DC
Current consumption	max. 80 mA, PCAN-Dongle ISO max. 140 mA
Connectors	
Supply	Cable to the keyboard jack of the PC, length about 50 cm/20 inches
PC	Sub-D (m), 25 pins (to standard parallel port)
CAN	Sub-D (m), 9 pins Pin assignment according to CiA recommendation DS 102-1 PCAN-Dongle ISO: galvanic isolation up to 500 V
CAN	
Specification	ISO 11898 High-speed CAN (up to 1 MBit/s) 2.0A (standard format) and 2.0B (extended format)
Controller	Philips SJA1000T
Transceiver	Philips PCA82C251
Environment	
Operating temperature	0 – 60 °C (32 – 140 °F)
Storage temperature	-20 – +80 °C (-4 – 176 °F)
Relative humidity	15 – 90 %, not condensing
EMC	EN 61000-6-3:2001 EN 61000-6-1:2001 EN 61000-6-4:2001 (only PCAN-Dongle ISO) EN 61000-6-2:2001 (only PCAN-Dongle ISO) EC directive 89/336/EEC
Measures	
Size	56 x 18 x 62 mm 2 3/16 x 11/16 x 2 7/16 Inches
Weight	max. 70 g (2.5 oz.)

Design and specifications are subject to change without notice.

Appendix A Certificates

A.1 CE

PCAN-Dongle IPEH-002015/19
PEAK-System Technik GmbH

EC declaration of conformity

Notes on the CE Symbol CE

The following applies to the PCAN-Dongle products IPEH-002015/19.

EC Directive

This product fulfills the requirements of EC directive 89/336/EEC on "Electromagnetic Compatibility," and is designed for the following fields of application as per the CE marking:

Field of Application	Requirement for Emitted Interference	Requirement for Noise Immunity
Residential, commercial and small businesses	EN 61000-6-3: 2001	EN 61000-6-1: 2001

Declarations of Conformity

In accordance with the above mentioned EU directives, the EC declarations of conformity and the associated documentation are held at the disposal of the competent authorities at the address below:

PEAK-System Technik GmbH
Mr. Wilhelm
Otto-Röhm-Str. 69
D-64293 Darmstadt
Germany

phone: +49 6151 81 73-20
fax.: +49 6151 81 73-29
info@peak-system.com

Signed this 20th day of December 2004

PCAN-Dongle ISO IPEH-002020 EC declaration of conformity
PEAK-System Technik GmbH

Notes on the CE Symbol CE

The following applies to the PCAN-Dongle ISO product IPEH-002020.

EC Directive

This product fulfills the requirements of EC directive 89/336/EEC on "Electromagnetic Compatibility," and is designed for the following fields of application as per the CE marking:

Field of Application	Requirement for Emitted Interference	Requirement for Noise Immunity
Residential, commercial and small businesses	EN 61000-6-3: 2001	EN 61000-6-1: 2001
Industrial	EN 61000-6-4: 2001	EN 61000-6-2: 2001

Declarations of Conformity

In accordance with the above mentioned EU directives, the EC declarations of conformity and the associated documentation are held at the disposal of the competent authorities at the address below:

PEAK-System Technik GmbH
Mr. Wilhelm
Otto-Röhm-Str. 69
D-64293 Darmstadt
Germany

phone: +49 6151 81 73-20
fax.: +49 6151 81 73-29
info@peak-system.com

Signed this 14th day of July 2004

Appendix B Quick Reference

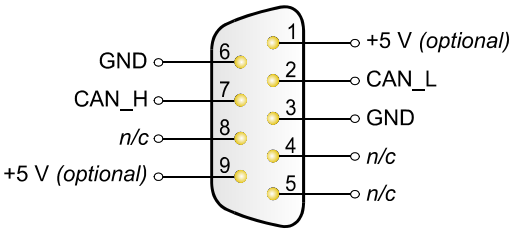
Hardware Installation

Connect the PCAN-Dongle to the PC's parallel port, insert the T-piece at the cable's end between the keyboard port at the PC and the keyboard connector (for power supply). When the PC is turned on, the red **LED** indicates an existing power supply.

Software installation and startup under Windows

Execute the driver installation program from the supplied CD-ROM. Restart Windows after the installation procedure.
Run the CAN monitor PCAN-View for Windows from the Start menu as a sample application for accessing the PCAN-Dongle. Get the parameters of the parallel interface (I/O address, interrupt) needed for initialization of the PCAN-Dongle from Windows' Device Manager.

HS-CAN connector (Sub-D, 9 pins)



n/c = not connected