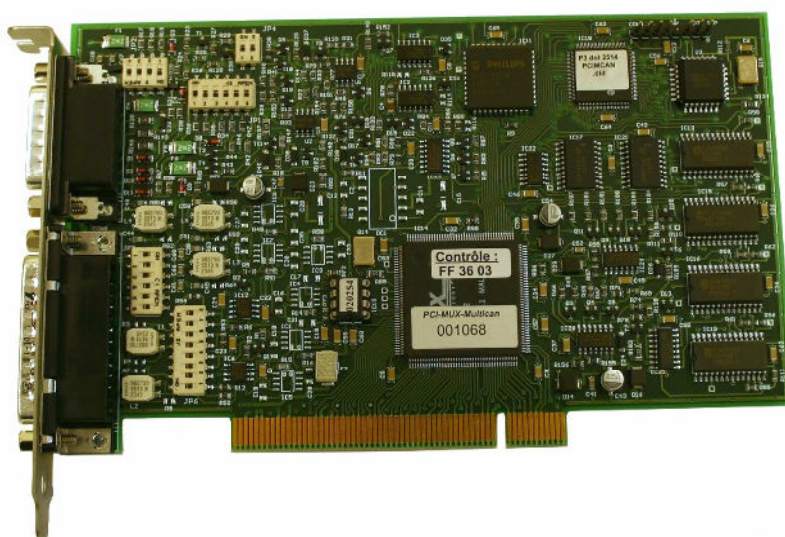




Card PCI-MUX-4C2L 4 CAN - 2 LIN



Installation guide

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1 Aim of this document and bibliography

1.1 Aim

The aim of this document is to give the user the information required to install and set up the case PCI-MUX-4C2L

1.2 Bibliography

PHILIPS : SJA1000 Standalone controller – data sheet

PHILIPS : PCA81C251 CAN transceiver for 24 V system – data sheet

PHILIPS : TJA1054 – Fault tolerant CAN transceiver – data sheet

PHILIPS : 26C92 – Dual universal asynchronous receiver / transmitter (DUART)

2 Presentation

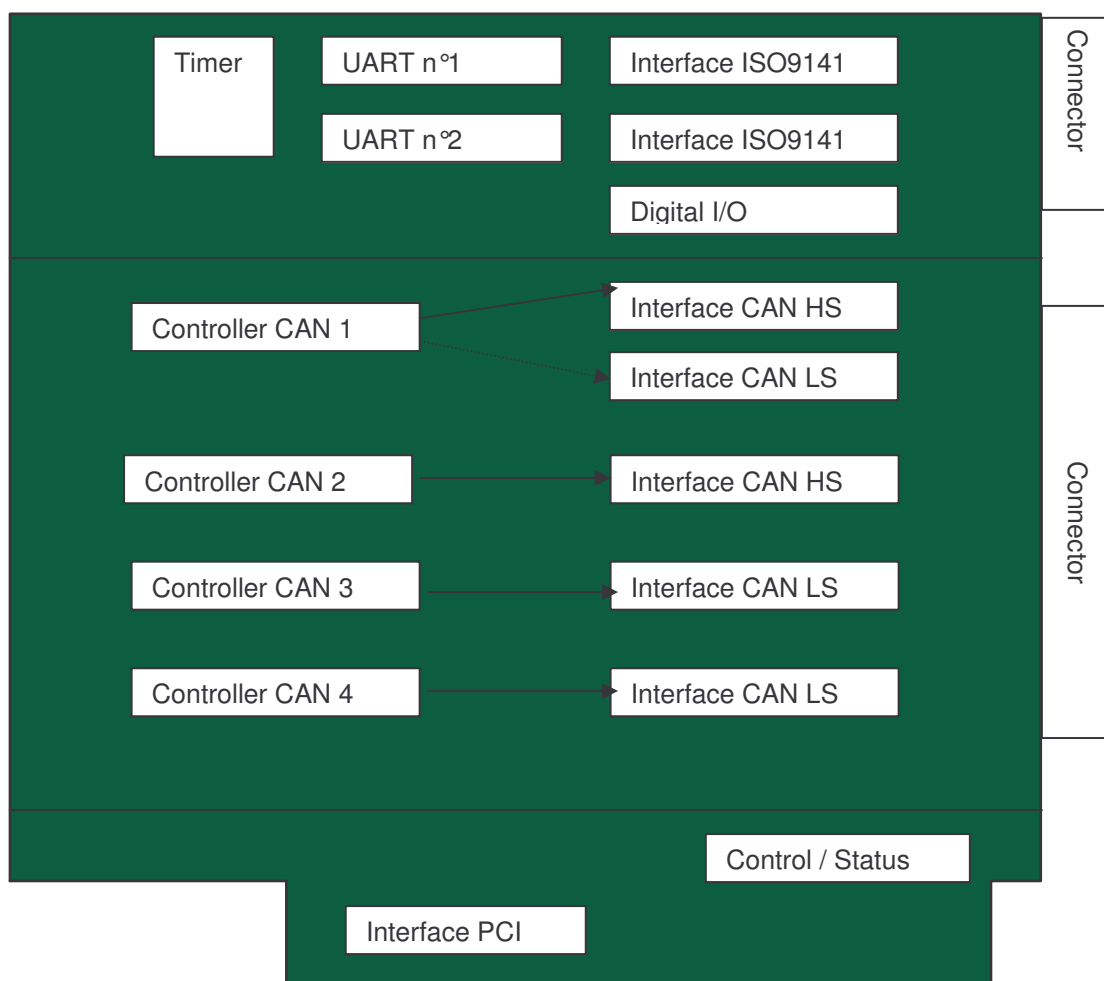
2.1 General presentation

The PCI-MUX-4C2L card allows interfacing a PC type computer to a CAN high speed, CAN low speed / fault tolerant, CAN single wire and LIN bus. The board has the following channels:

- 1 CAN high speed channel (Standard ISO 11898) or 1 CAN low speed – fault tolerant channel, this channel is chosen through the software.
- 1 CAN high speed channel
- 2 CAN low speed channels
- 2 LIN/ ISO9141 channels

Simultaneous access to these 6 buses is possible.

2.2 Diagram



2.3 Main characteristics of the CAN channel

2.3.1 Protocol controller : PHILIPS SJA1000

- Standard CAN 2.0B
- Standard identifier 11 bits; extended 29 bits
- Transmission / reception of data up to 8 bytes
- Request for distant transmission (RTR)
- Baud rate up to 1 Mbit/sec
- Spy mode (no acknowledgement or error frame)
- Reading of counters of internal errors
- Detailed information in case of bus error

2.3.2 High speed line interface: PHILIPS PCA82C251

- Standard ISO 11898–24V
- Baud rate up to 1 Mbit/sec
- Channel up to 110 stations on the bus
- Transmission in differential mode
- Short circuit to ground and > 24V battery
- Adjustment of the termination resistor between CANH and CANL via a staple.
- Adjustment by software of the signal slope (vertical edges or horizontal edges)

2.3.3 Low speed line interface: PHILIPS TJA1054

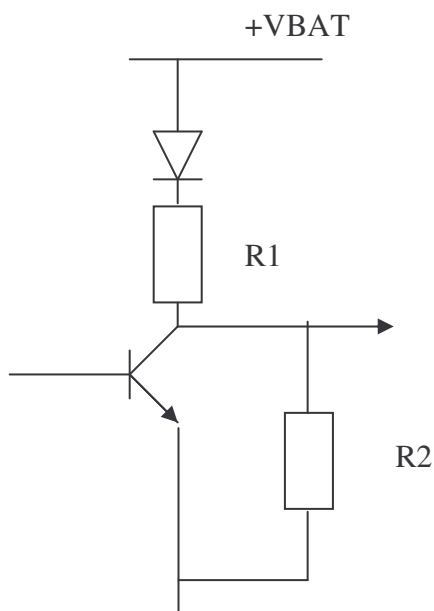
- Baud rate up to 125 Kbit/sec
- Channel up to 32 stations on the bus
- Transmission in differential mode
- Possibility to operate on 1 wire
- Detection and treatment of degraded modes
 - o Short-circuit to ground
 - o Short-circuit to VCC
 - o Short-circuit to the battery
 - o Short-circuit between CANH and CANL

2.4 Main characteristics of the LIN/ISO9141 channel

- ISO9141 standard
- K&L lines
- ISO transmission rate* : 9600 bauds, 10400 bauds, 62.5 Kbauds and 125 Kbauds
- LIN transmission rate* : 2400 bauds, 9600 bauds, 19200 bauds and 20833 bauds.
- Configuration of the pull-up, pull-down or tester mode through jump on the card.

* : The PCI-MUX-xxxx cards do not allow the configuration of different bit rate for various channels used (bit rate LIN1 = bit rate LIN2).

Diagram of the transmitter/receiver line



For the configuration of resistances R1 and R2, see paragraph "4.1.3.1 Pull-up and pull-down resistors configuration".

2.5 Characteristics of digital inputs / outputs

Diagram of inputs

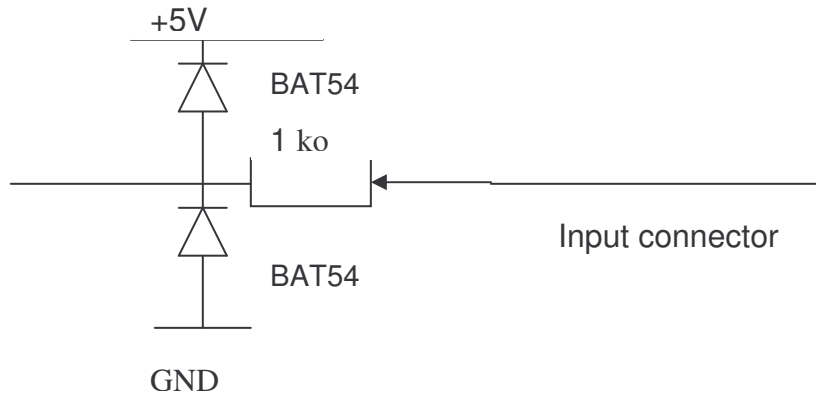
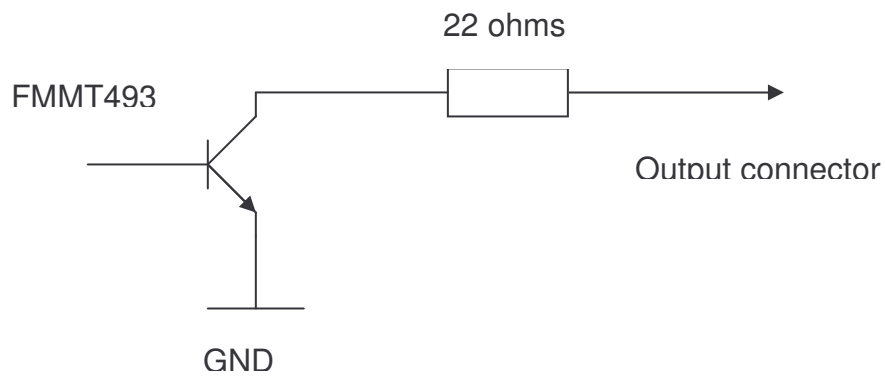


Diagram of outputs



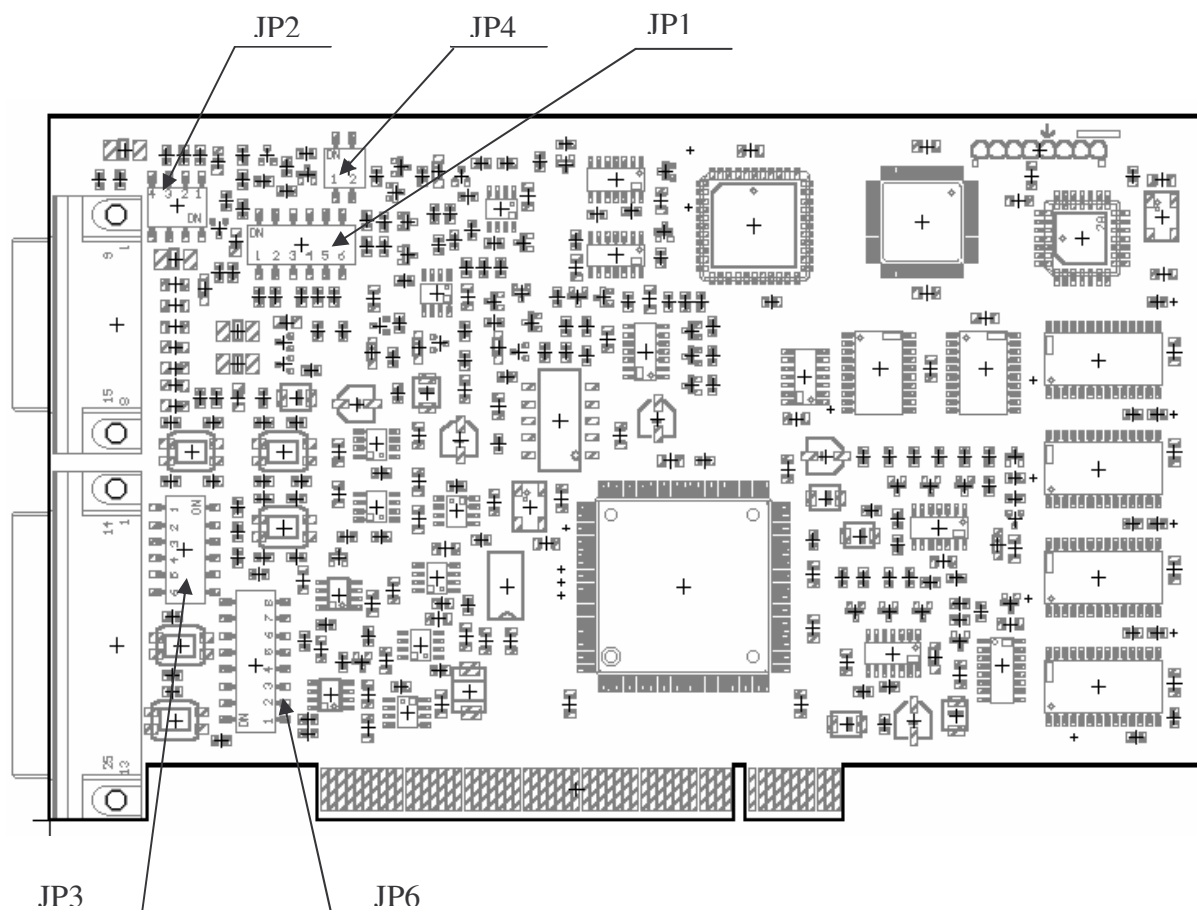
3 Technical Specifications

3.1 Technical characteristics

Presentation	PCI interface including : - 1 CAN high speed channel or CAN low speed / fault tolerant - 1 CAN high speed channel - 2 CAN low speed / fault tolerant channels - 2 LIN/ISO9141 channels
Micro-controller	None
Controller	CAN : 4 PHILIPS SJA1000 controllers ISO : 1 DUART 26C92
Line interface	. CAN high speed : PCA82C251 . CAN low speed : TJA1054 . ISO : pull-up, pull-down, tester or LIN
Digital inputs / outputs	2 0-12V inputs 4 open collector outputs
Connector	1 connector DB25 1 connector DB15
PC Interface	PCI bus at 33MHz
Dimensions	180 x 110 mm
Power supply	+5V and +12V provide by the computer +External battery for stand by or reawakening management
Consumption	N.C.
Storage temperature	-40 to +85 °c
Operating temperature	0 to 70 °c
Isolation	Not isolated

4 Configuration

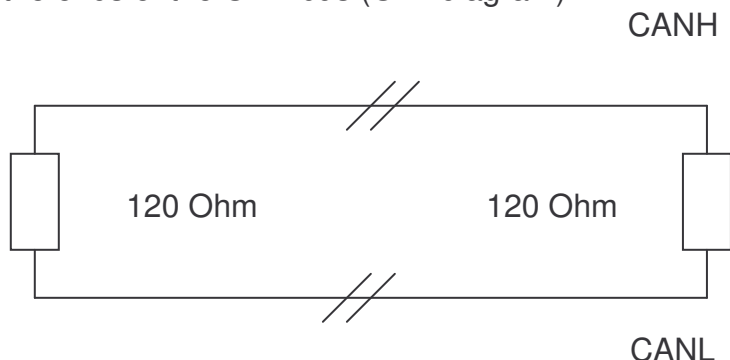
4.1 Diagram of external peripherals



JP6	CAN high speed	Termination resistor
JP3	CAN low speed	Internal or external power supply
JP2	LIN	Pull-up and pull-down configuration for channel n°1
JP4	LIN	
JP1	LIN	Pull-up and pull-down configuration for channel n°2

4.1.1 CAN HS Configuration of the termination resistor

The CAN high speed standard recommends the attachment of the termination resistor to the ends of the CAN bus (C.F. diagram).



The PCI-MUX boards allow user to get the following configurations:

- Setting up without termination resistor: used when the board is connected to an already configured bus.
- Setting up with termination resistor: used when the board is connected to an end of the CAN bus.
- Setting up with termination resistor and capacitance.

4.1.1.1 Set up without termination resistor (default)

CAN HS 1	CAN HS 2
JP6.1 OFF	JP6.5 OFF
JP6.2 OFF	JP6.6 OFF
JP6.3 OFF	JP6.7 OFF
JP6.4 OFF	JP6.8 OFF

4.1.1.2 Set up with 120 Ohm termination resistor

CAN HS 1	CAN HS 2
JP6.1 ON	JP6.5 ON
JP6.2 ON	JP6.6 ON
JP6.3 OFF	JP6.7 OFF
JP6.4 OFF	JP6.8 OFF

4.1.1.3 Set up with 120 Ohm termination resistor and capacitance

CAN HS 1	CAN HS 2
JP6.1 ON	JP6.5 ON
JP6.2 ON	JP6.6 ON
JP6.3 ON	JP6.7 ON
JP6.4 ON	JP6.8 ON

4.1.2 CAN LS : Power supply of the physical interface

The power supply of the physical interface CAN low speed can either be the 12V from the PC or from an external battery. The choice of power supply from external battery is generally reserved for applications with consumption management (stand by / reawakening).

4.1.2.1 Set up with internal power supply (default)

CAN1 Bus	CAN2 Bus	CAN3 Bus
JP3.1 OFF	JP3.3 OFF	JP3.5 OFF
JP3.2 ON	JP3.4 ON	JP3.6 ON

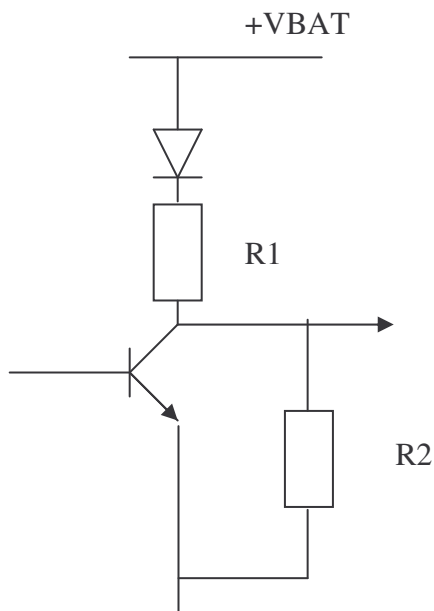
4.1.2.2 Set up with external power supply

The power supply is done via the +CANx pins of the DB25 connector

CAN1 Bus	CAN2 Bus	CAN3 Bus
JP3.1 ON	JP3.3 ON	JP3.5 ON
JP3.2 OFF	JP3.4 OFF	JP3.6 OFF

4.1.3 LIN/ISO9141 : Power supply of the physical interface

4.1.3.1 Pull-up and pull-down resistors configuration



Use	R1	R2
ISO9141 UCE pull up mode	47 K	470 K
ISO9141 UCE pull down mode	NC	47 K
ISO9141 UCE tester mode	510 ohm	NC
ISO9141 UCE tester mode 125kbit/s	330 ohm	NC
LIN master mode	1 K	NC
LIN slave mode	47 K	NC

4.1.3.2 Pull-up and pull-down resistors configuration : channel N°1

R1=infinite	R1=330	R1=510	R1=1Ko	R1=47Ko
JP2.1 OFF	JP2.1 ON	JP2.1 ON	JP2.1 OFF	JP2.1 OFF
JP2.2 OFF	JP2.2 ON	JP2.2 OFF	JP2.2 ON	JP2.2 ON
JP2.3 OFF	JP2.3 OFF	JP2.3 OFF	JP2.3 OFF	JP2.3 ON

R2=47Ko	R2=470Ko	R2=infinite
JP4.1 ON	JP4.1 OFF	JP4.1 OFF
JP4.2 OFF	JP4.2 ON	JP4.2 OFF

4.1.3.3 Pull-up and pull-down resistors configuration : channel N²

R1= infinite	R1=330	R1=510	R1=1Ko	R1=47Ko
JP1.1 OFF	JP1.1 ON	JP1.1 ON	JP1.1 OFF	JP1.1 OFF
JP1.2 OFF	JP1.2 ON	JP1.2 OFF	JP1.2 ON	JP1.2 ON
JP1.3 OFF	JP1.3 OFF	JP1.3 OFF	JP1.3 OFF	JP1.3 ON

R2=47Ko	R2=470Ko	R2=infinite
JP1.4 ON	JP1.4 OFF	JP1.4 OFF
JP1.5 OFF	JP1.5 ON	JP1.5 OFF

5 Installation

5.1 Installation for Windows 98 / 2000 / XP

5.1.1 Installation procedure

- 1 – Insert PCI-MUX card inside the slot PCI of your computer. (Computer out of range)
- 2 – Turn on your computer
- 3 – Detection of the case



Windows detects the « plug & play » peripherals and displays a message : “new device has been found”. The following window appears:

Click on NEXT

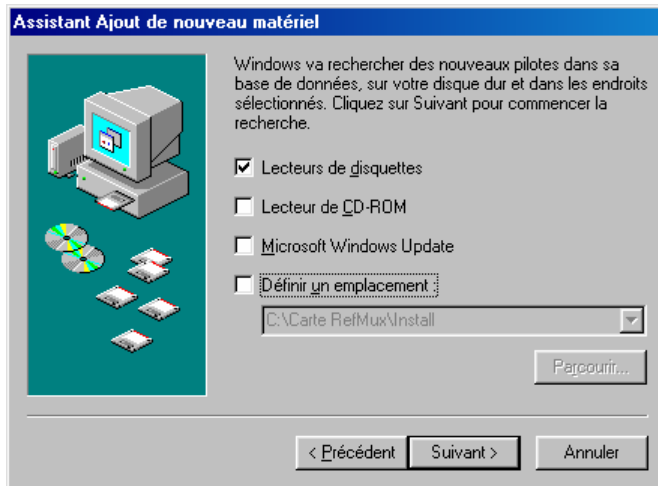
4 – Finding drivers

Select the best among recommended drivers.

Click on NEXT



5 – Accessing case drivers



Insert installation diskette or CD Rom, then select chosen drive and the PCI-9x directory.

Click on NEXT

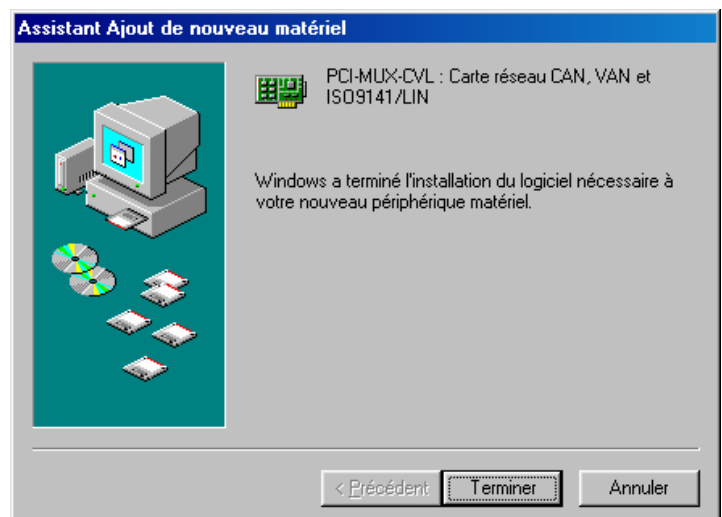
6 – Start installation.



The name of the installation file is recognised (PCI_MUX.INF).

Click on NEXT

7 – Installation complete



5.1.2 List of installed files

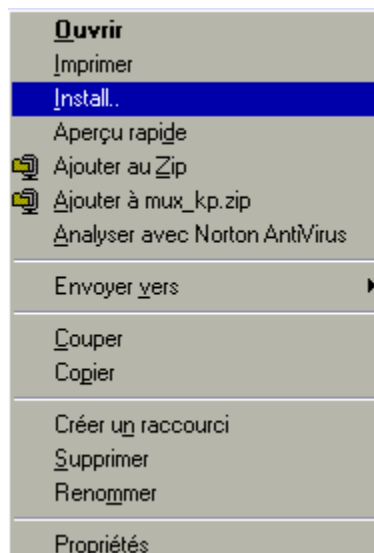
Name	Destination	Comments
muxdll.dll	windows\system	Dynamic library MUX-DLL
mux_kp.sys	Windows\system32\drivers	Driver PCI-MUX board
windrvr.sys	windows\system32\drivers	Driver for OS WIN 9X/2000/XP
wdvirt.inf	windows\system32\drivers	Driver for OS plug and play
Wdreggui.exe	windows\system32\drivers	Recording utility

5.2 Installation for Windows NT

5.2.1 Installation procedure

- ✓ Insert Exxotest CD Rom and explore the “PCI-NT” folder.
- ✓ Select the file PCI-MUX.inf, and do a right click on your mouse.
- ✓ Select “install”.

Install done.



5.2.2 List of installed files

Name	Destination	Comments
muxdll.dll	winnt\system32	Dynamic library MUX-DLL
mux_kp.sys	winnt\system32\drivers	Driver PCI-MUX board
windrvr.sys	winnt\system32\drivers	Driver for OS WIN 9X/2000/XP
wdreg.exe	winnt\system32\drivers	Recording utility

6 Connector

6.1 DB15 connector (LIN / ISO9141, inputs/outputs)

Pin	Name	Designation
1	ISOK1	Line K of channel ISO9141 n°1 or LIN N°1
2	ISOL1	Line L of channel ISO9141 n°1
3	GND	Ground
4	RTS1	Output n°0
5	RTS2	Output n°1
6	OP2BU	Output n°2
7	OP3BU	Output n°3
8	ISOVBAT	External power supply VBAT
9	GND	Ground
10	ISOK2	Line K of channel ISO9141 n°2 or LIN N°2
11	ISOL2	Line L of channel ISO9141 n°2
12	CTS1	Input n° 0
13	CTS2	Input n° 1
14		
15	ISO_APC	External power supply +Contact On

6.2 DB25 Connector (CAN high speed and low speed connections)

Pin	Name	Designation
1	CANLS_L1	Line CANL of CAN low speed bus n°1
2	CANLS_H1	Line CANH of CAN low speed bus n°1
3	+CAN1	External power supply +CAN of CAN low speed bus n°1
4	CANLS_L3	Line CANL of CAN low speed bus n°3
5	CANLS_H3	Line CANH of CAN low speed bus n°3
6	+CAN3	Power supply +CAN of CAN low speed bus n°3
7	CANLS_L4	Line CANL of CAN low speed bus n°4
8	CANLS_H4	Line CANH of CAN low speed bus n°4
9	+CAN4	Power supply +CAN of CAN low speed bus n°4
10	CANLS_L1	Line CANL of CAN low speed bus n°1
11	CANLS_H1	Line CANH of CAN low speed bus n°1
12	CANHS_L1	Line CANL of CAN high speed bus n°1
13	CANHS_H1	Line CANH of CAN high speed bus n°1
14	GND	Ground
15	ST_REG1	Open collector command relay (reawakening=grounding)
16		
17	GND	Ground
18	ST_REG3	Open collector command relay (reawakening=grounding)
19		
20	GND	Ground
21	ST_REG4	Open collector command relay (reawakening=grounding)
22	CANHS_L2	Line CANL of CAN high speed bus n°2
23	CANHS_H2	Line CANH of CAN high speed bus n°2
24	GND	Ground
25	GND	Ground

List of successive editions

Version	Date	Author	Modifications
01	10/2000	PC	Document creation
02	05/2002	PC	Jumpers modification
03	03/2003	PC	Change of the installation folders
04	11/2003	AV	Modifications 1 st page
05	02/2005	CV	Adding the jumpers configuration to set the LIN/ISO9141 pull up resistor to 330 Ohms