EXXOtest®

Case USB-MUX-DIAG
1 CANHS/LS – 1 CANHS – 4 KWP2000

USER GUIDE

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1 Aim of this document and bibliography

1.1 <u>Aim</u>

The aim of this document is to give the user the information required to install and set up the case USB-MUX-DIAG.

1.2 <u>Bibliography</u>

PHILIPS : SJA1000 Standalone controller – data sheet

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

PHILIPS : TJA1054 – Fault tolerant CAN transceiver – data sheet

Keyword Protocol 2000 - 3F - Diagnostic Services Implementation – July 1999

Keyword Protocol 2000 - 2F –Communication protocol for diagnostic - January 1998

2 Presentation

2.1 General presentation

The Case USB-MUX-DIAG allows interfacing a PC type computer to a CAN high speed, CAN low speed / fault tolerant, ISO9141 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
- 4 ISO9141/ LIN channels with a sequential access (Only one UART)
- 1 input for detect a low battery level.

The diagnostics channel can be managed either using the ISO14230 protocol (KWP2000), or using Diagnostic On Can for CAN channels.

This case feeds use USB power supply and vehicle's battery from the OBD connector.

2.2 Diagram
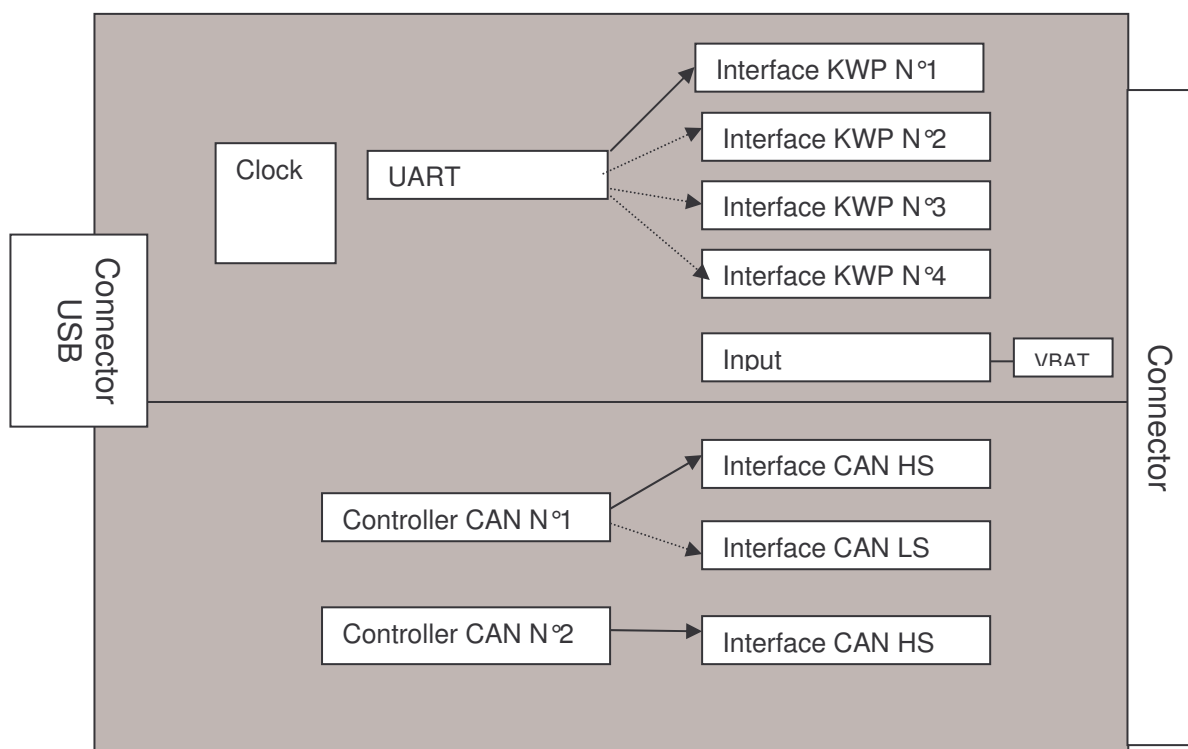
2.3 Main characteristics of the CAN channel

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
    - Short-circuit to ground
    - Short-circuit to VCC
    - Short-circuit to the battery
    - Short-circuit between CANH and CANL
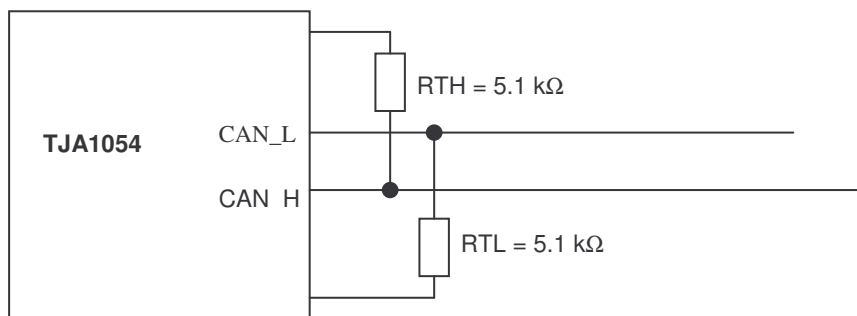
2.4 Main characteristics of the LIN/ISO9141 channel

2.4.1 Line interface: Tester mode
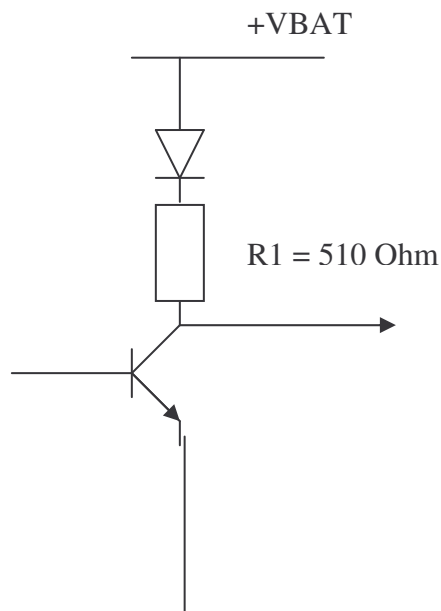
3 Technical Specifications

3.1 <u>Technical characteristics</u>

Presentation	PC interface case for USB bus including : - 1 CAN high speed channel or CAN low speed / fault tolerant - 1 CAN high speed channel - 4 ISO9141/LIN channels
Controller	CAN : 2 PHILIPS SJA1000 controllers ISO : 1 UART
Line interface	. CAN high speed : PCA82C251 . CAN low speed : TJA1054
Digital inputs / outputs	1 0-12V input Detection level (low battery) : 9 Volts ± 5%
Connector	Diagnostic connector with 16 pins (J1962)
PC Interface	Bus USB 12 Mbit/sec
Dimensions	110 x 45 x 20 mm
Power supply	Provided by USB bus and vehicle
Consumption	150 mA
Storage temperature	-40 to +85℃
Operating temperature	0 to 70℃
Isolation	Not isolated

4 Connector

4.1 <u>Connector 16 pins J1962</u>

Pin	Name	Designation
1	N.C	Reserved
2	N.C.	Reserved
3	CANHSA_H	Line CANH of CAN high speed bus n°1
4	GND	Tester ground
5	GND	Signal ground
6	CANHSB_H	Line CANH of CAN high speed bus n°2 (EOBD)
7	KWPA	Line K of ISO bus n°1 (EOBD)
8	CANHSA_L	Line CANL of CAN high speed bus n°1
9	CANLSA_H	Line CANH of CAN low speed bus n°1
10	CANLSA_L	Line CANL of CAN low speed bus n°1
11	KWPB	Line K of ISO bus n° 2
12	KWPC	Line K of ISO bus n° 3
13	KWPD	Line K of ISO bus n° 4
14	CANHSB_L	Line CANL of CAN high speed bus n°2 (EOBD)
15	KWPA_L	Line L of ISO bus n° 1 (EOBD)
16	VBAT	Power supply

4.2 <u>USB Connector</u>

USB standard connector "type B"

Pin	Name	Designation
1	VBUS	Power supply : +5V
2	D-	Communication signal
2	D+	Communication signal
4	GND	Ground

4.3 <u>LED</u>

This LED indicates:
- *Red/Orange flashing*: presence of a power supply in the case and its good working order.
- *Red fixed:* card error (Power supply trouble or bad firmware version)

5 Installation

5.1 Installation for Windows 9x8

5.1.1 Installation procedure

1 – Connect the USB bus coming from the PC to the USB case
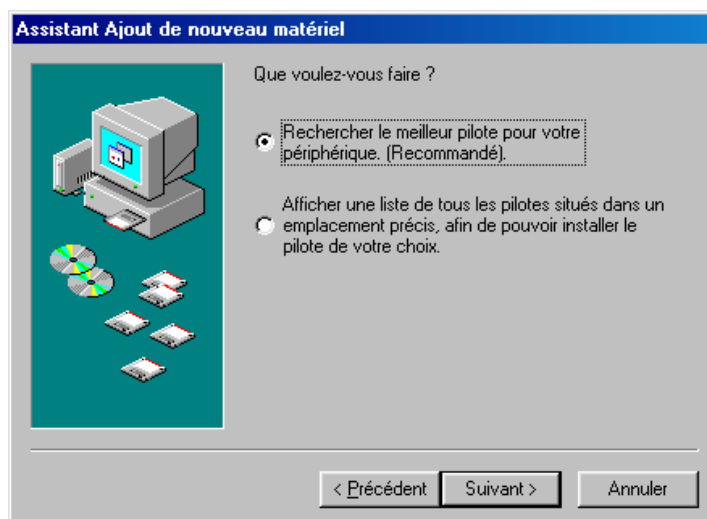
2 – Detection of the case

Windows detects the « plug & play » peripherals and says that a new device has been found. The following window appears:
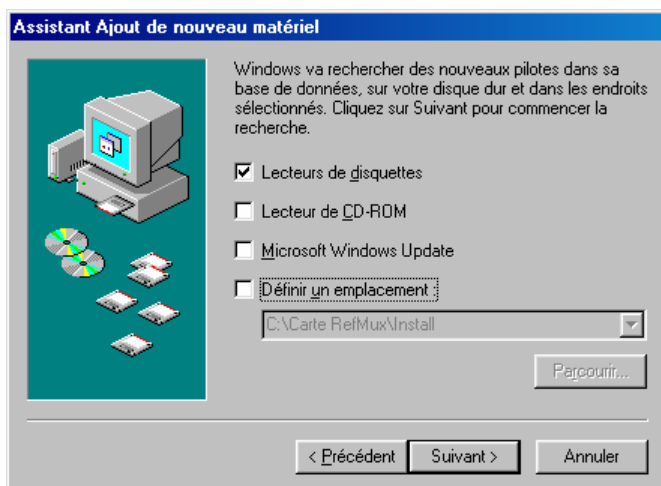
Click on NEXT

3 – Finding drivers

Select the best among recommended drivers.

Click on NEXT

4 – Accessing drivers

Insert installation diskette or CD Rom, then select chosen drive and the USB9x directory.
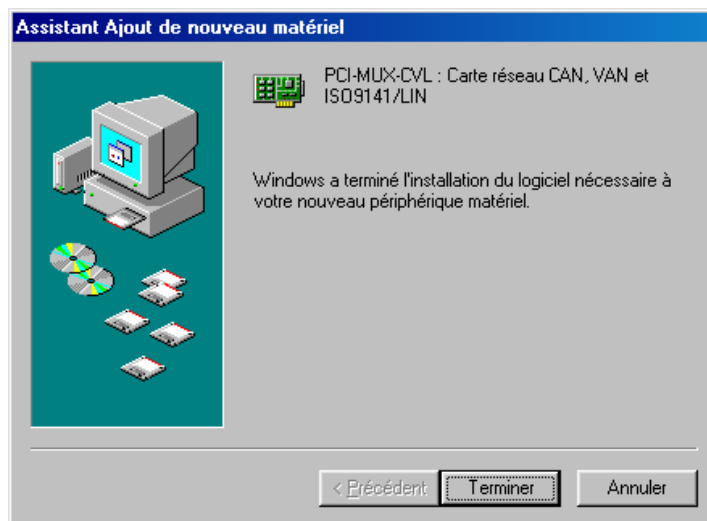
Click on NEXT

5 – Start installation.

The name of the installation file is recognised (usb_mux.inf).

Click on NEXT

6 – Installation completed

5.1.2 List of installed files

Name	Destination	Comments
muxdll.dll	windows\system	Dynamic library MUX-DLL
mux_kp.sys	windows\system\vmm32	Driver USB-MUX board
windrvr.sys	windows\system\vmm32	Driver for OS WIN 98
wdpnp.sys	windows\system\vmm32	Driver for OS plug and play
wdreg.exe	windows\system\vmm32	Recording utility

5.2 Installation for Windows CE/Mobile with ARM processor

5.2.1 Installation procedure

1 – insert the installation CD into your computer,

2 – Copy installation files *[CD :]\ Usb-WinCE(ARM)\Setup_USBMUX.CAB* into a temporary folder of your pocket PC.
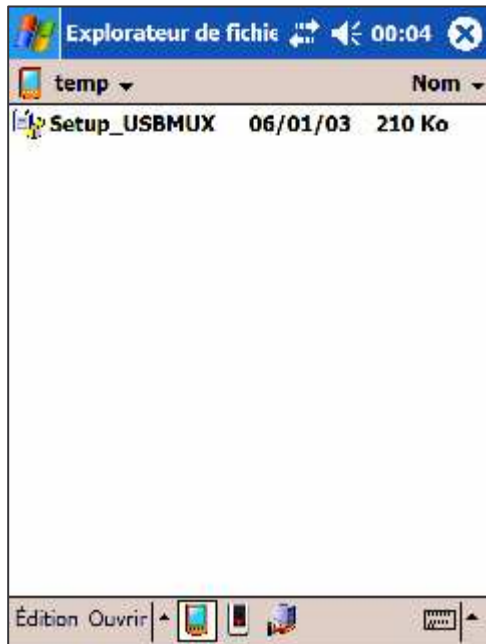
3 – Run «*Setup_USBMUX.CAB*» on your Pocket PC

4 – Plug case USB-MUX-DIAG onto your Pocket PC and enter the driver name : «exxotest».

5 – Installation completed.

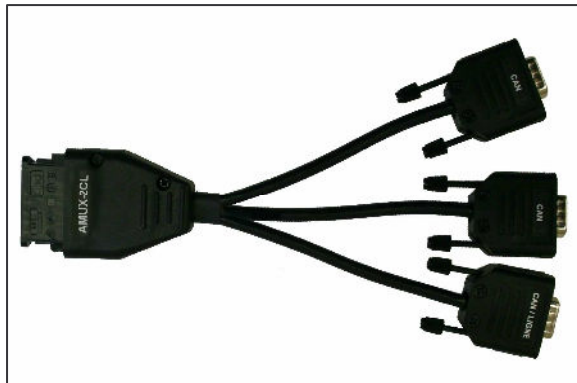5.2.2 <u>List of installed files on your Pocket PC</u>

File name	Folder	Comment
muxdll.dll	.\windows	Dynamic library MUX-DLL
exxotest.dll	.\windows	Card's driver USB-MUX
USBINTFC.dll	.\windows	USB's driver

6 Annex

6.1 Connector AMUX-2CL (optional)

Connectors

SUB D9 CAN HS1	
2	CANL
3	GND
7	CANH

SUB D9 CAN HS2	
2	CANL
3	GND
7	CANH

SUB D9 CANLS/ KL	
2	CANL
3	GND
4	LIGNE L
7	CANH
8	LIGNE K
9	+ Battery

List of successive editions

Version	Date	Author	Modifications
01	10/2003	PC	Document creation
02	11/2003	AV	Modifications 1st page
03	01/2004	PC	Add accessory AMUX-2CL
04	09/2004	CV	Add resistances RTH and RTL values (CAN LS)
05	10/2004	CV	Add installation procedure for Windows CE/Mobile