

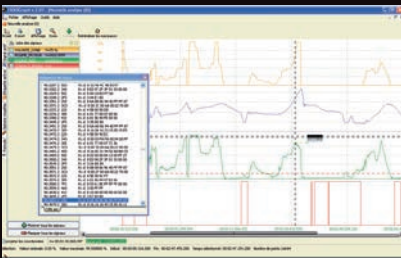
Communication interfaces & dataloggers | Software & utilities for analysis, logging, emulation, graphical post-treatment | Accessories | Developpement

# Expertise systems Communication networks

## GUIDE/EN

Automotive & Industry

[www.exxotest.com](http://www.exxotest.com)



**EXXOTEST**®

# Expertise systems Communication networks

Guide/EN  
Automotive & Industry

ANNECY ELECTRONIQUE develops under EXXOTEST® trademark a complete range of hardware and software solutions for acquisition, analysis or processing of data from communications networks CAN, LIN, ISO9141, ...

Beyond hardware solutions, communications interfaces, data loggers and gateways, we offer software solutions, software development kit EXXOTEST® SDK, API J2534, etc..

To best meet all your needs, our R&D department also allows us to meet more specific needs: electronic and mechanical design, embedded software development, PC application development, prototyping, validation, development and mass production.

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# USB-MUXDiag-II

Compact USB communication interfaces for CAN HS/LS, LIN, ISO 9141

Second generation of compact USB communication interfaces, the EXXOTEST® USB-MUXDiag-II has the particularity to allow a direct connection to the ISO J1962 centralized diagnostic connector of the vehicle.

Two types of connectors, industrial non-intrusive and standard, and different pinouts adapted to several car manufacturers, offer an answer to your application domains and utilization constraints.

The USB-MUXDiag-II allows to interface a PC computer type to CAN (HS / LS-FT), SAE J1939, NMEA2000, LIN (1.3/2.0/2.1), ISO9141, communication networks as well as through 2 digital or analog inputs.

To be used with EXXOTEST® MUXTrace Expert and proprietary applications (MUXDLL software library provided) ■



## Interfaces & Accessories part numbers

### USB-MUXDiag-II\*

Version with standard J1962 connector.

### USB-MUXDiag-II-C\*

Version with industrial J1962 connector.

### PASSTHRU-MD2

USB-MUXDIAG-II delivered with SAE J2534-1 Passthru licence and software kit.

### AMUX-2C2L

Female ISO J1962 to 4 x male Sub D9 adapter.

### AMUX-YOBD

Male ISOJ1962 to 2 x female ISO1962.



## Technical specifications

### Presentation

Thermoformed (ABS) case allowing 2 can channels, 2 LIN/ISO9141 channels, 2 ISO9141/LIN channels

### Protocol controllers

CAN: 1 x TWINCAN - LIN/ISO: 2 x UART

### Line interfaces

CAN high speed: 2 x TJA1040 - CAN low speed: 1 x TJA1054  
LIN/ISO: 2 x MC33661 (Master or Slave)

### Inputs / Outputs

1 analog or digital TOR 0-16 V input,  
1 analog or digital input dedicated to power supply supervision

### Timebase

100 µsec clock

### Connector

1 x J1962 (OBD 16 pins male)

### PC interface

USB bus

### Size

140 x 58 x 23 mm

### Power supply

6-36 V USB or external (vehicle)

### Consumption

Stand-by mode: < 30 mA (12 V)  
Active mode: < 200 mA (12 V)

### Storage Temperature

-40°C to +85°C

### Functioning Temperature

-20°C to +70°C

\* Specific pinouts available: PSA, RENAULT/NISSAN, FORD - Other car manufacturers: on demand

# DLx-MUXDiag-II

Compact autonomous data loggers for CAN HS/LS, LIN, ISO 9141

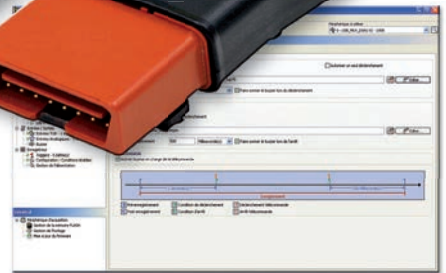
Based on the EXXOTEST® USB-MUXDiag-II communication interface, DLx-MUXDiag-II data loggers allow the acquisition of data exchanged on CAN (HS / LS-FT), LIN (1.3/2.0/2.1) and ISO9141 networks, as well as through two analog or digital inputs. They also allow autonomous emissions of CAN and DiagOnCAN messages.

Totally autonomous, they offer a recording capacity of 4GB (expandable) and are available in 2 case designs, open case (removable and interchangeable memory card) and closed case (memory card not extractable).

Delivered with its remote control and EXXOTEST® DLC configuration and data retrieval software (DLC application details on page 5).

Two types of connectors, industrial non-intrusive and standard, and different pinouts adapted to several car manufacturers, offer an answer to your application domains and utilization constraints.

Although intended to be used as independent data loggers, the DLx-MUXDiag-II-maintained all the features of USB-MUXDiag-II communication interfaces and are therefore usable with applications as EXXOTEST® MUXTrace Expert and proprietary applications (MUXDLL software library provided)



## Interfaces & Accessories part numbers

### DLC-MUXDiag-II

Close case version with standard J1962 connector, remote control and EXXOTEST® DLC application.

### DLO-MUXDiag-II \*

Open case version with standard J1962 connector, remote control and EXXOTEST® DLC application.

### DLC-MUXDiag-II-C \*

Close case version with industrial J1962 connector, remote control and EXXOTEST® DLC application.

### AMUX-2C2L

Female ISO J1962 to 4 x male Sub D9 adapter.

### AMUX-YOBD

Male ISOJ1962 to 2 x female ISO1962.

## Technical specifications

<b>Presentation</b>	Thermoformed (ABS) case allowing 2 can channels, 2 LIN/ISO9141 channels, 2 ISO9141/LIN channels
<b>Recording capacity</b>	4Gb Compact Flash
<b>Protocol controllers</b>	CAN: 1 x TWINCAN - LIN/ISO: 2 x UART
<b>Line interfaces</b>	CAN high speed: 2 x TJA1040 - CAN low speed: 1 x TJA1054 LIN/ISO: 2 x MC33661 (Master or Slave)
<b>Inputs / Outputs</b>	1 analog or digital TOR 0-16 V input, 1 analog or digital input dedicated to power supply supervision
<b>Timebase</b>	100 µsec clock
<b>Connector</b>	1 x J1962 (OBD 16 pins male)
<b>PC interface</b>	Bus USB
<b>Size</b>	140 x 58 x 23 mm
<b>Power supply</b>	6-36 V USB or external (vehicle)
<b>Consumption</b>	Stand-by mode: < 30 mA (12 V); active mode: < 200 mA (12 V)
<b>Storage Temperature</b>	-40°C to +85°C
<b>Functioning temperature</b>	-20°C to +70°C

\* Specific pinouts available: PSA, RENAULT/NISSAN, FORD - Other car manufacturers: **On demand.**  
Design and manufacturing of specific or industrial versions: **On demand.**

# DLC

## EXXOTEST® data loggers configuration and management software

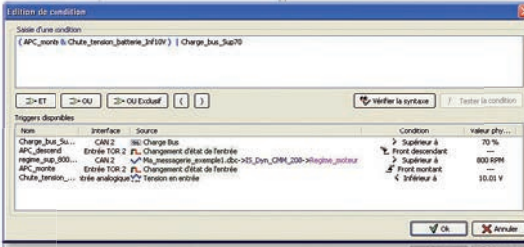
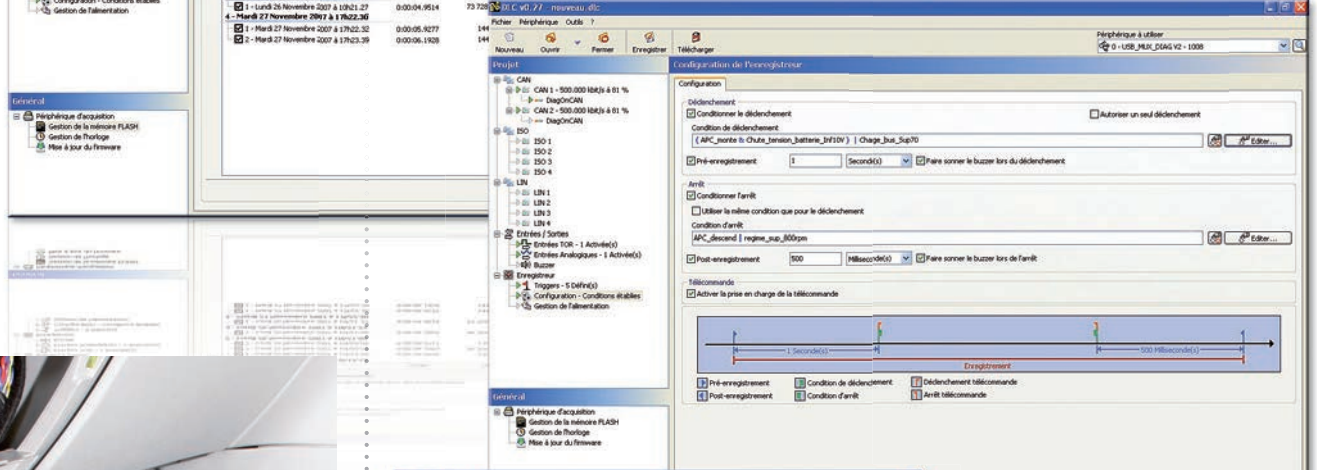
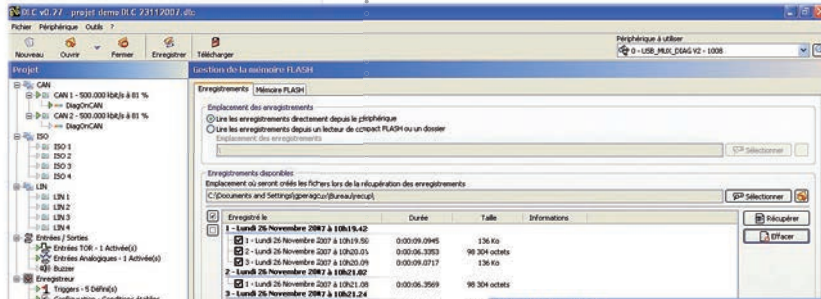
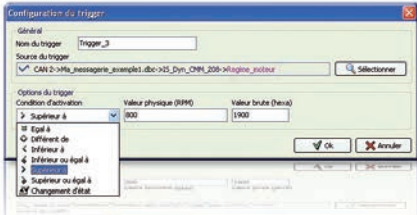


Dedicated to EXXOTEST® data loggers, DLC allows the data logger configuration and recorded data recovery

### Mains features

- Data logger channels activation and configuration (protocol, baud rate, dbc, ldf, ... databases association, ...).
- Creation of CAN and/or Diag On CAN emission tables.
- Activation and configuration of analog and digital inputs.
- Triggers creation (based on signals, frames, protocol errors, bus load, digital input edge, ...).
- Start and stop conditions configuration (based on triggers combinations, remote control buttons, ...) and associated pre-trigger / post-trigger values.

- Power supply management (stand-by levels).
- Flash memory management: retrieval of data (asc file format), of the configuration present in the data logger, consultation of the occupancy rate of the memory card, erasing all or part of records on the card,...
- Embedded clock and PC clock synchronization.



### Current Applications

- Drive** Conditions monitoring of a vehicle during track drives, monitoring of the context of occurrence of a fault.
- Factory** Acquisition of data exchanges between vehicle and download / configuration tools during manufacturing, data acquisition in a vehicle freeing the constraints of recording using a PC, analysis of vehicles on park.
- After Sales** After-sales monitoring context of random occurrence of a malfunction in a customer's vehicle.

# USB-MUX-xxx

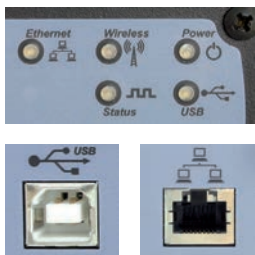
USB / Ethernet communication interfaces for CAN HS/LS/SW, LIN, ISO9141

New generation of EXXOTEST® USB / Ethernet boxes intended to interface a PC computer type with communication networks, the USB-MUX-xxx boxes offer increased performances and are proposed in 2 versions:

- USB-MUX-6C6L :**  
 6 CAN (HS/LS/SW) channels,  
 6 LIN/ISO9141 K channels,  
 14 analog or digital inputs,  
 6 ISO9141/L or TOR outputs,  
 6 TOR/PWM outputs,  
 1 RS232 link.
- USB-MUX-4C4L :**  
 4 CAN (HS/LS/SW) channels,  
 4 LIN/ISO9141 K channels,  
 12 analog or digital inputs,  
 4 ISO9141/L or TOR outputs,  
 6 TOR/PWM outputs,  
 1 RS232 link.

These boxes remain fully compatible with EXXOTEST® MUXTrace Expert application and with proprietary applications associated to older generation of EXXOTEST® USB boxes.

- Optionally, the USB-MUX-xxx boxes can be associated to a 8GB (expandable capacity) data logger function including a remote control, the configuration and management application EXXOTEST® DLC (Description of the application on page 5) and its corresponding license.
- A "USB-MUX-opto" option offering 3 CAN and 3 LIN isolated channels is also proposed.



## Characteristics common to all references

<b>Presentation</b>	Aluminium box
<b>Timebase</b>	500 ns clock
<b>Connector</b>	55 to 7 x SubD9 + 1 x SubD15
<b>PC interface</b>	USB bus and Ethernet
<b>Size</b>	150 x 200 x 55 mm
<b>Power supply</b>	Alimentation 7-36V USB or external
<b>Consumption</b>	Active mode: < 200 mA Stand-by mode: < 10 mA Extended stand-by mode: < 1mA (12 V)
<b>Storage Temperature</b>	-40°C to +85°C
<b>Functioning temperature</b>	-20°C to +70°C

## Interfaces, Options & Accessories part numbers

### USB-MUX-6C6L

Standard version 6 x CAN + 6 x LIN/ISO9141 + 14 ANA/TOR inputs + 6 TOR/PWM outputs + 6 TOR/ISO9141 L outputs.

### USB-MUX-4C4L

Standard version 4 x CAN + 4 x LIN/ISO9141 + 12 ANA/TOR inputs + 6 TOR/PWM outputs + 4 TOR/ISO9141 L outputs.

### FLEXRAY

Version under development



### DLC-Option

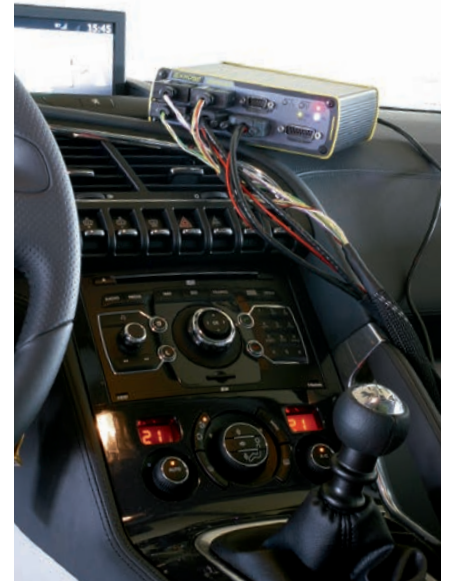
**Option** - Data logger function with 8Go (min) memory card, remote control and EXXOTEST® DLC software licence.

### USB-MUX-Opto

**Option** - 3 x CAN + 3 x LIN isolation.

### AMUX-BSI2010

**Wiring harness** - Specific interfacing cable for PSA BSI2010.



### Technical specifications USB-MUX-6C6L

#### 6 x CAN (HS/LS/SW) + 6 x LIN/ISO9141

#### Protocol controller

CAN: MultiCAN - LIN/ISO9141: 4 x USIC

#### Line interface

CAN high speed: 6 X TJA1040 - CAN low speed: 6 x TJA1055  
CAN single wire: 6 x MCZ33897 - LIN/ISO9141: 6 x MC33661

#### Inputs / Outputs

14 analog 0-32 V inputs or digital 0-32 V (of which 1 Timer input)  
6 ISO9141/L or digital TOR 0-24 V outputs; 6 TOR/PWM outputs; 1 RS232 link up to 1Mbps (shared with one of the LIN interfaces, optionally: RS485)

#### Connectors

6 x SubD9 + 1 x SubD15 on the front panel  
1 x SubD9 + USB + Ethernet + power supply jack + Compact flash slot on the back panel

### Technical specifications USB-MUX-4C4L

#### 4 x CAN (HS/LS/SW) + 4 x LIN/ISO9141

#### Protocol controller

CAN: MultiCAN - LIN/ISO9141: 4 x USIC

#### Line interface

CAN high speed : 4 X TJA1040 - CAN low speed: 4 x TJA1055  
CAN single wire: 4 x MCZ33897 - LIN/ISO9141: 4 x MC33661

#### Inputs / Outputs

12 analog 0-32 V inputs or digital 0-32 V (of which 1 Timer input)  
4 ISO9141/L or digital TOR 0-24 V outputs; 6 TOR/PWM outputs; 1 RS232 link up to 1Mbps (shared with one of the LIN interfaces, optionally: RS485)

#### Connectors

4 x SubD9 + 1 x SubD15 on the front panel  
1 x SubD9 + USB + Ethernet + power supply jack + Compact flash slot on the back panel

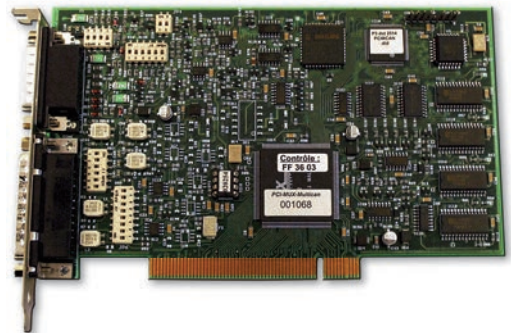
## PCI-MUX-xxx

PCI communication interfaces for CAN HS/LS/SW, LIN, ISO9141

The EXXOTEST® PCI boards are designed to interface a PC computer type to communication networks

### Characteristics common

<b>Presentation</b>	Card with format PCI
<b>Timebase</b>	1ms clock
<b>Connector</b>	1 x SubD25 + 1 x SubD15
<b>PC interface</b>	PCI bus 33 Mhz
<b>Size</b>	180 x 110 mm
<b>Power supply</b>	+5 V and +12 V delivered by the PC or external power supply
<b>Isolation</b>	Not isolated
<b>Storage Temperature</b>	-40°C to +85°C
<b>Functioning Temperature</b>	-20°C to +70°C



### Technical specifications PCI-MUX-4C2L

#### Protocol controller

CAN : 4 X SJA1000 - LIN/ISO9141 : 1 x DUART 26C92

#### Line interface

CAN high speed : 2 X PCA82C251 - CAN low speed: 3 x TJA1054  
LIN/ISO9141: type pull-up, pull-down or LIN

#### Inputs / Outputs

2 analog or digital 0-12 V inputs,  
4 open drain outputs.

**The PCI-MUX-4C2L version proposes the following channels:** 1 CAN HS channel, 1 CAN HS or CAN LS channel, 2 CAN LS channels, 2 LIN master/slave channels or ISO9141, 2 inputs and 4 outputs.

### Technical specifications PCI-MUX-C3V2L

#### Protocol controller

CAN : 1 X SJA1000 - VAN : 6 X TSS461C - LIN/ISO9141 : 1 x DUART 26C92

#### Line interface

CAN high speed : 1 X PCA82C251 - CAN low speed : 1 x TJA1054  
VAN : 3 x MTC30522 (REM) - LIN/ISO9141 : type pull-up, pull-down ou LIN

#### Inputs / Outputs

2 analog or digital 0-12 V inputs,  
4 open drain outputs

**The PCI-MUX-C3V2L proposes the following channels:** 1 CAN HS or CAN LS channel, 3 VAN channels, 2 LIN master/slave or ISO9141 channels, 2 inputs and 4 outputs.

# GW-MUX-2C2L

CAN HS, CAN LS and LIN gateways

The EXXOTEST® GW-MUX-2C2L gateway allows the copy and / or signals processing from a bus to another bus. Development of specific signals processing functions on demand ■



## Part numbers

### GW-MUX-2C2L

Configurable gateway  
CAN HS / CAN LS / LIN (all combinations)



## Technical specifications GW-MUX-2C2L

Protocol controller	CAN, TWINCAN - LIN, UART
Line interface	CAN high speed : TJA1040 - CAN low speed : TJA1054 LIN : MC33661
Timebase	100 µs clock
Connector	1 x SubD9
PC interface	USB Bus
Power supply	6-36V
Storage Temperature	-40°C to +85°C
Functioning Temperature	-40°C to +85°C
Isolation	Not isolated

# DIS-MUX-CAN

Configurable acquisition and display device for CAN HS and CAN LS networks.

The DIS-MUX-CAN allows the display of data extracted from a CAN bus to which it is connected, as well as from two 0-36Vdc analog inputs.

It fits with several applications, e.g. installed in front of a testing bench (panel mount) it will allow a quick and complementary reading of parameters ; fixed on vehicle's windshield using its specific support (optional) during driving test sessions...

The associated PC application allows creating from CAN databases (dbc file format) a signal list to be transmitted through USB to the DIS-MUX-CAN. ■



6 buttons placed around the screen, allow navigating into the menus of the embedded application as to select signals to be displayed.

## Technical specifications DIS-MUX-CAN

Protocol controller	CAN 2.0b / 1Mbps
Line interface	CAN High Speed TJA1040T - Termination resistance 120 Ohms (set up by software) / CAN Low Speed TJA1055T
Analog inputs	2 inputs 0-36 V
Timebase	500 ns clock
Connectors	4 x MSTBVA (2/3/5/6)
PC interface	USB Bus
Power supply	6-36 V
Storage Temperature	-30°C to +80°C
Functioning Temperature	-20°C to +70°C
Screen / Box sizes	60 x 32 mm / 120 x 80 x 26 mm
Screen resolution	128 x 64 pixels - Transmissive (blue)



# MUXTrace Expert

Analysis and emulation software for communication networks



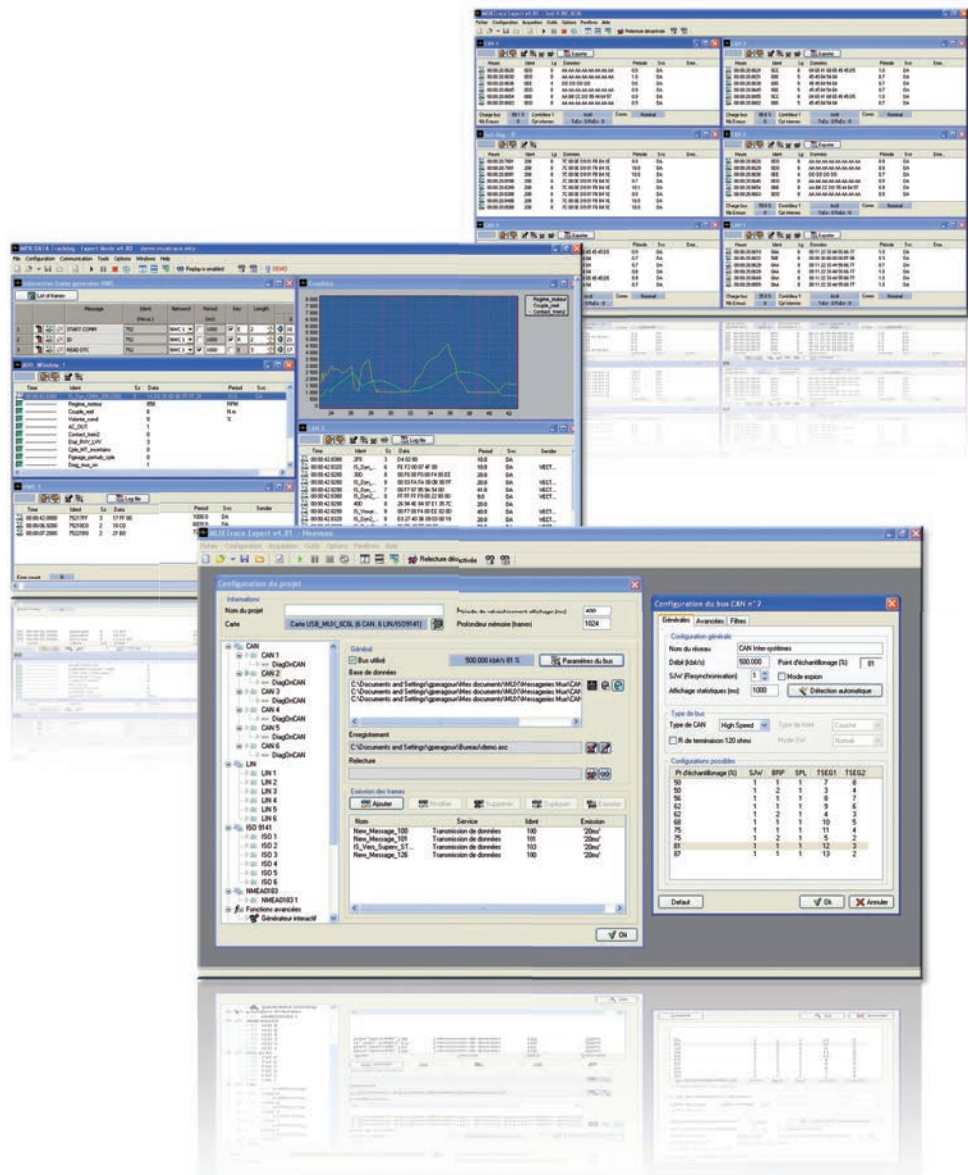
The EXXOTEST® MUXTrace Expert application is an analysis and emulation tool for CAN High Speed, CAN Low Speed "fault tolerant", VAN, LIN, ISO9141, NMEA0183 and J1939 / NMEA2000 communication networks.

It also allows the management of CAN communication layers in compliance with ISO15765-2 (DiagOnCAN) and ISO14229-1 (UDS).

The project design, particularly easy and intuitive, makes of MUXTrace Expert a comfortable tool for analysis, observation, acquisition or data exchange simulation

## MUXTrace Expert proposes a large range of features as:

- Analyze up to 5 network types simultaneously,
- Visualize the decoded values using associated databases (dbc, ldf,... file formats),
- Display values graphically,
- Record the frames transiting on buses (asc file format)
- Display general information and statistics (bus load, controller status, internal counters, degraded modes, frames periodicity, ...)
- Send peridics and events messages
- Replay records
- Add of user extension (as a dll)
- Free demo version available on [www.exxotest.com](http://www.exxotest.com) (download area)



The MUXTrace Expert license can at any time be associated with an EXXOTEST® communication interface: USB / Ethernet boxes, PCI boards, data loggers, ...

In order not to impose the association of MUXTrace Expert license to a single PC, the license is associated to the

communication interface. Therefore, any PC that is connected to an "Expert" interface will allow the full operation of MUXTrace Expert features.

The updates of the PC application and interfaces firmware are free and unlimited.

# MUXDLL

## Software libraries

Software library runs under Windows XP to Seven (32 & 64 bits) and enable simple and fast interfacing of a PC application, to one or several CAN HS, CAN LS "fault tolerant", VAN, LIN, J1939 and NMEA2000 networks. ■

Using the functions from this library gives the user the possibility to make the application transparent regarding the protocole controllers and line interfaces resident on the board and modules. These applications work with all EXXOTEST® materials.

MUXDLL software library and its associated user manual can be freely downloaded from our website at [www.exxotest.com](http://www.exxotest.com) and are systematically delivered with any communication interface.

# MUXUtilities Pack

## Post-treatment tools

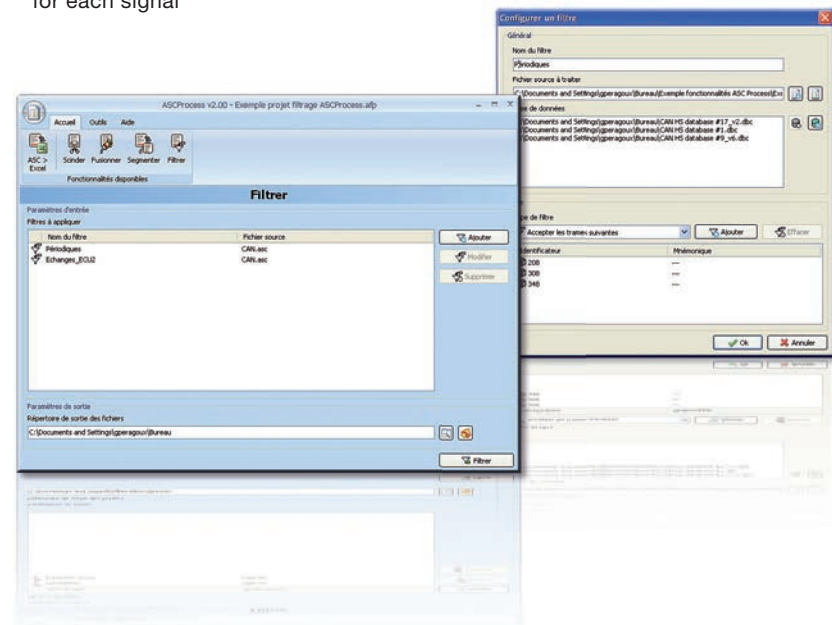
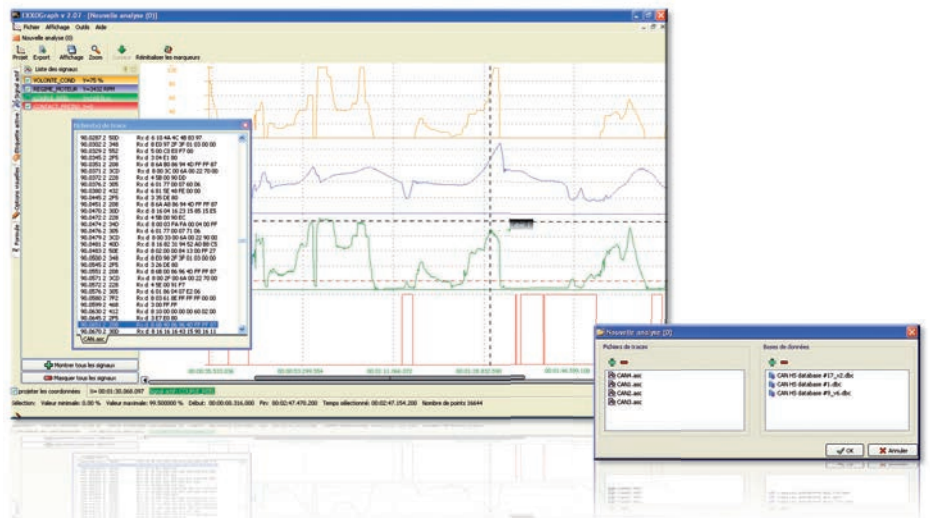
The MUXUtilities "Pack" met several utilities including powerful graphical analysis EXXOGRAPH and a tool for processing asc trace files ■

The EXXOGRAPH graphical analysis tool allows the exploitation of trace files from the use of tools as MUXTrace Expert, DLC or any other tool generating asc format file traces. It allows, in one project, the simultaneous opening of multiple log files and the association of several databases (dbc format, ldf, ...).

- Multi-file / multi-databases projects
- Display the signals in the form of synchronized or superimposed oscillograms
- Display of Min / Max / Current values for each signal
- Zoom function, measurements between markers, autoscaling, ...
- Function "tag", csv export, export to bmp format file, printing, ...

The ASCProcess trace file processing tool offers features as:

- Function "conversion" of asc file to csv file
- Function "split" to create as many trace files as channels present in the original log file
- Function "Merge" to combine several log files in a single file
- Function "segment" to break a large trace file in defined size files
- Function "filter" to generate trace files filtered by frame identifier (free ID or selected from an associated dbc,ldf, ... database) error frame, ...



# AMUX-xxx

## Accessories, Cables and Adapters

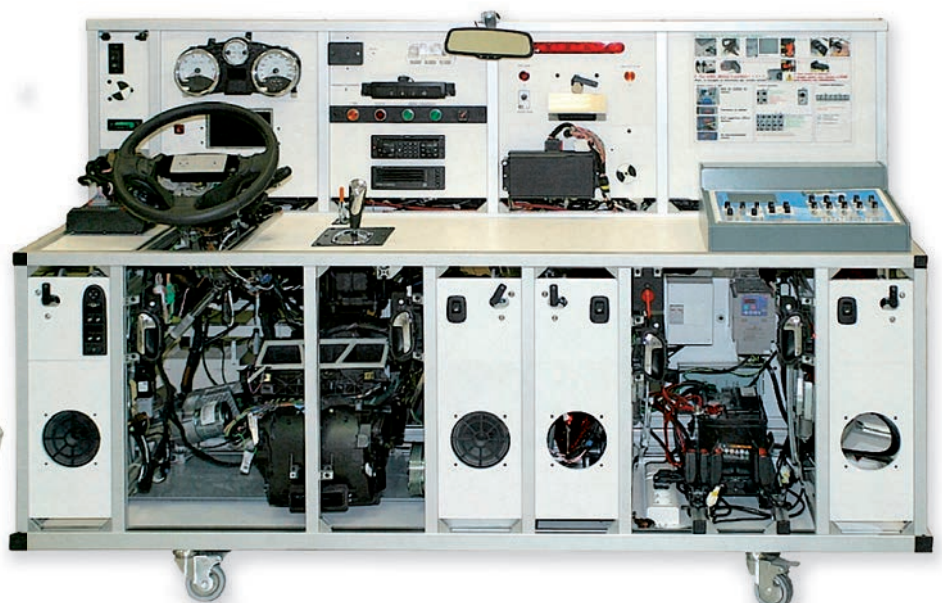
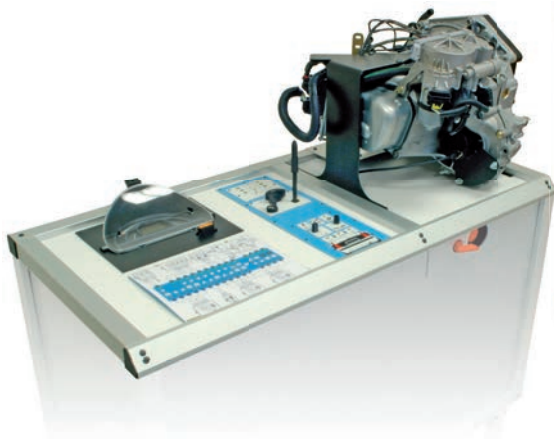
	Part number	Description	Interfaces
	<b>AMUX-2C2L</b>	Female ISO J1962 to 4 x male SUB D9 adapter.	<b>USB-MUXDiag-II-x DLx-MUXDiag-II-x</b>
	<b>AMUX-YOBD</b>	"Y" derivation cable for OBD diagnostic connector (1x J1962 male to 2x J1962 female).	<b>USB-MUXDiag-II-x DLx-MUXDiag-II-x + any tool or interface equipped with a J1962 male connector</b>
	<b>AMUX-YOBD-CREA</b>	"Y" derivation cable for OBD diagnostic connector (1x J1962 industrial* male to 2x J1962 female).	
	<b>AMUX-BSICAN-DB9</b>	PSA BSI CAN interface to 3 x SubD9 for CAN IS, CAN CONF, and CAN CAR.	
	<b>AMUX-BSI-2010</b>	PSA BSI2010 interface to 6 x SubD9 for CAN IS, CAN DIAG, CAN DYN, CAN CONF, CAN CAR, CAN INFO-DIV and Lin 1 to 3.	
	<b>AMUX-DB9-CAN</b>	SUB D9 female to banana plugs for 1 CAN HS or LS network.	<b>AMUX-2C2L AMUX-C4C-DB9 AMUX-CC3V-DB9</b>
	<b>AMUX-DB9-LIN</b>	SUB D9 female to banana plugs for 1 LIN network.	<b>AMUX-2C2L AMUX-CC3V-DB9</b>
	<b>AMUX-OBD-OBDD-Std</b>	Test box with 3 x female standard J1962 connectors + 2 x male SubD9 + optional 10-30V / 0-10A power supply	
	<b>AMUX-OBD-OBDD-Indus</b>	Test box with 3 x female industrial J1962 connectors + 2 x male SubD9 + optional 10-30V / 0-10A power supply	

\* Piston contacts

## Mock-up and specific realizations

Anney Electronique also carries your mock-ups, "electronics architecture" integration & validation tables and test benches, according to your specifications and requirements.

Modular, transportable, scalable solutions designed to meet your needs such as training, test or even validation.



**Feel free to send us your needs or specifications!**



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