

The USB-MUX-4C4L is a 2<sup>nd</sup> generation USB box from the EXXOTEST® « Communication Networks Expertise» products range.

It allows interfacing a PC type computer (or Pocket PC) to communication networks as CAN HS, LS/FT, Single Wire and LIN/ISO9141 through a USB or Ethernet link. It also proposes 12 analog or digital inputs, 4 ISO9141 L or digital outputs and 6 digital/PWM outputs. A data logger function can be added optionally.

**Channels available:**

- 4 CAN high speed channels (ISO 11898) standard or CAN low speed – *fault tolerant* or CAN single wire to be configured by software.
- 4 LIN master or slave channels or ISO9141 (K) to be configured by software.
- 12 analog or digital 0-32V inputs.
- 4 ISO9141 (L) or digital outputs, 6 digital/PWM outputs.
- 500ns time base.

Main characteristics	
<b>Presentation</b>	PC box with USB / Ethernet link . 4 CAN channels (HS/LS/SW) . 4 ISO9141 K / LIN (M/S) channels
<b>Protocol controllers</b>	. CAN : MultiCAN . LIN : 2 x USIC
<b>Line interfaces</b>	. CAN high speed : 4 x TJA1040 . CAN low speed : 4 x TJA1055 . CAN single wire : 4 x MCZ33897 . LIN : 4 x MC33661
<b>Inputs / outputs</b>	12 analog 0-32V or digital 0-32V inputs (of which 1 TIMER input)  4 ISO9141/L or digital TOR 0-24 V outputs; 6 TOR/PWM outputs; 1 RS232 link up to 1Mbds (shared with one of the LIN interfaces, optionally: RS485)
<b>Time base</b>	500 nsec RTC clock
<b>Connectors</b>	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
<b>PC interface</b>	USB / Ethernet
<b>Size</b>	200 x 170 x 50 mm
<b>Power supply</b>	External 7-36V (vehicle) or USB +alimntation by each interface connection
<b>Storage temperature</b>	-40 to +85°C
<b>Functioning temperature</b>	-40 to +85°C (USB) 0 to +80°C (Ethernet)
<b>Isolation</b>	option



**CAN channel characteristics:**

*Protocol controller: INFINEON MultiCAN*

- Identifier standard 11 bits and extended 29 bits
- Data transmission / reception of up to 8 bytes
- Remote transmission request (RTR)
- Non intrusive mode (no acknowledge or error frame)
- Reading of internal error counters and detailed information in case of bus error.
- CAN TT (Time Triggered) support

*High speed line interface: NXP TJA1040*

- Transmission rate up to 1 Mbits/sec
- Connection of up to 110 stations on the network
- Transmission in differential mode
- Adjustment of termination resistance between CANH and CANL by software
- Software control of standby / wake-up management signals.

*Low speed line interface: NXP TJA1055*

- Transmission rate up to 125 Kbit/sec
- Connection of up to 32 stations to the bus
- Transmission in differential mode, can operate on 1 wire
- Detection and processing of downgraded modes (short-circuit and open circuit)
- Operating data feedback to application in downgraded mode (ERR)
- Software control of standby / wake-up management signals.
- Configuration of pull-up and pull-down resistance (choice between 560Ω, 820Ω, 2.2KΩ and 6.8KΩ).

*Single wire lance interface: FREESCALE MCZ33897*

- Transmission rate up to 33.3 Kbit/s (100 Kbit/s max)
- Connection of up to 32 stations on the bus
- Transmission over 1 wire
- Configuration of pull-up by software

**ISO9141/LIN channel characteristics:**

- ISO 9141 standard
- Baud rate of 10400 bauds (KWP2000)
- LIN Rev 2.1 specifications
- Baud rate of 2400, 9600, 19200 and up to 250Kbps (downloading mode)

**Additional tools and accessories**



**Applications:**

**MUXTRACE Expert:** Buses analyser and emulator for CAN HS/LS/SW, LIN/ISO9141, VAN & Diag On CAN protocol.

- Configuration by software of pull-up in master mode (1Ko) or slave (30 Ko) for LIN ; 30KΩ in « Simu » mode and 500Ω in « Tester » mode for the ISO9141 K line

**SOFTWARE LIBRARY:**

DLL-MUX-xxx a software library for rapid and simplified use of different networks:

- Network configuration and transmission / reception functions.
- Access to several networks and boards simultaneously (identification of board position on the USB bus).
- Possibility under certain conditions to date stamp messages transmitting over the network.
- Calculation of bus load, statistic counters, application timer, downgraded modes...

More details on the features of the functions and the different networks supported, onto the DLLMUX-xxx technical data sheet.

**COMPATIBLE SOFTWARES:**

MUXTRACE Expert: Buses analyser and emulator for CAN HS/LS/SW, LIN/ISO9141, VAN & Diag On CAN protocols