Boitier NI USB-8473s

CAN and LIN Interfaces for Hi-Speed USB

NI USB-8472, NI USB-8472s, NI USB-8473, NI USB-8473s, NI USB-8476, NI USB-8476s,

- 1-port interfaces for high-speed CAN, low-speed/fault-tolerant CAN, and LIN
- Optional hardware synchronization
- Hi-Speed USB, bus-powered
- 500 V digital isolation
- Bus error logging
- Hardware timestamping – 1 µs resolution

CAN Interfaces

- Philips SJA1000 CAN controller
- Transmit/receive 100 percent bus load at 1 Mb/s
- ISO 11898 compliance for standard (11-bit) and extended (29-bit) arbitration IDs
- Software-selectable termination for low-speed/fault-tolerant CAN
- J1939 compliance

LIN Interfaces

- Atmel ATA6620 transceiver
- LIN 1.3/2.0 and J2602 compliance
- Software-selectable master/slave termination

Operating Systems

- Windows Vista/XP/2000

Recommended Software

- LabVIEW
- LabWindows™/CVI
- Visual C++ 6.0
- Visual Basic 6.0
- Borland C/C++

Application Software (included)

- CAN/LIN bus monitoring and logging utility

Driver Software (included)

- NI-CAN

Model	Physical Layer	Transceivers	Ports	Max Transfer Rate (kb/s)	Hardware Sync	Software Termination	API
USB-8472	Low-speed/fault-tolerant CAN	TJA1054AT	1	125	–	✓	Frame
USB-8472s	Low-speed/fault-tolerant CAN	TJA1054AT	1	125	✓	✓	Frame
USB-8473	High-speed CAN	TJA1041	1	1,000	–	–	Frame
USB-8473s	High-speed CAN	TJA1041	1	1,000	✓	–	Frame
USB-8476	LIN	ATA6620	1	20	–	✓	Frame
USB-8476s	LIN	ATA6620	1	20	✓	✓	Frame

Table 1. NI USB-847x Selection Guide

Overview

NI USB-847x devices provide Hi-Speed USB interfaces for Controller Area Network (CAN) and Local Interconnect Network (LIN) monitoring, logging, and testing. With high-speed CAN, low-speed/fault-tolerant CAN, and LIN interfaces featuring optional hardware synchronization, you can use two or more USB-847x devices together to interface to a wide variety of CAN and LIN networks.

The USB-847x interfaces are ideal for many types of applications, including:

- In-vehicle network monitoring and logging
- Bus load monitoring
- Device validation with synchronized data acquisition
- CAN device development and test
- CAN and LIN data correlation with external measurements

The convenient all-in-one design features a captive 2 m USB cable and built-in transceiver, requiring no extra cables or accessories to get applications running quickly.

With hardware timestamping, you can log messages with microsecond-accurate timestamps for reconstructing network events and correlating data across synchronized devices. All USB-847x interfaces use an industry-standard 9-pin male D-Sub (DB9) connector to interface to CAN and LIN buses.

Hi-Speed USB connectivity and onboard frame buffering ensure no dropped frames, even under 100 percent bus loads.

CAN Interfaces

USB-847x CAN interfaces feature the industry-standard Philips SJA1000 CAN controller, which implements ISO 11898 CAN functionality. The SJA1000 offers additional features to aid in system development, including listen-only mode, sleep/wakeup mode, error counter access, and self-reception (echo) mode. USB-847x CAN interfaces recognize standard (11-bit) and extended (29-bit) arbitration IDs and are compatible with J1939 networks.

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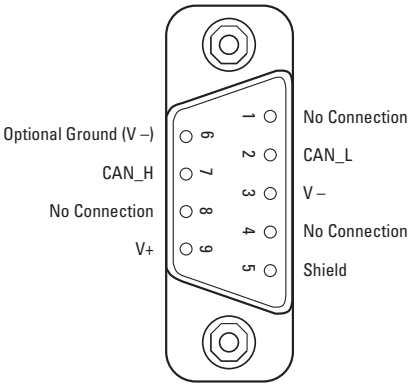

Figure 1. CAN DB9 Connector (USB CAN Modules)

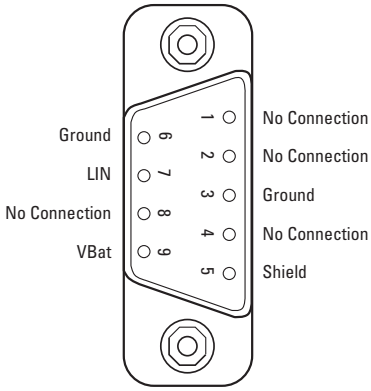

Figure 2. LIN DB9 Connector (USB LIN Modules)

Low-speed/fault-tolerant USB-847x CAN interfaces offer software-selectable termination for compatibility with all low-speed network configurations.

Onboard Physical Layer

The CAN physical layer connects the CAN controller to the physical bus wires. USB-847x CAN interfaces are available with high-speed and low-speed/fault-tolerant physical layers. All USB-847x devices have onboard physical layer transceivers and require no external dongles. The physical layers are internally powered via a DC-to-DC converter and electrically isolated up to 500 V.

LIN Interfaces

NI USB-8476 LIN interfaces, featuring the Atmel ATA6620 LIN transceiver, are compliant with the LIN 1.3/2.0 and J2602 specifications and offer software-selectable master/slave termination. The ATA6620 features baud rates up to 20 kb/s and offers advanced power management with a low-power sleep mode.

Hardware Synchronization

Many automotive applications demand tight integration of CAN, LIN, analog, and digital measurements. In applications such as CAN device development and validation, you need to synchronize different measurements to correlate data. You can program this synchronization in software, but OS latency and clock drift between the different onboard oscillators introduce unacceptable delays for certain automotive test applications.

NI offers USB-847x CAN and LIN interfaces with an optional hardware synchronization feature, with which the USB interfaces can share timing and triggering signals with other USB-847x interfaces, as well as data acquisition, vision, and motion devices, to achieve true hardware synchronization. Determinism is maintained between the trigger signal and the desired response because timing and triggering signals are handled in hardware. The host PC software interacts only to retrieve the data once it is acquired or to write new data.

NI-CAN Software

National Instruments provides NI-CAN driver software for Windows Vista/XP/2000. NI-CAN includes a detailed API and examples for NI LabVIEW and LabWindows/CVI, Microsoft Visual C/C++ 6.0 and Visual Basic 6.0, and Borland C/C++. USB-847x interfaces use the NI-CAN Frame API for frame-level access to messages on CAN and LIN networks. The NI-CAN driver software also includes the Bus Monitor and NI Spy utilities to aid in application development.

NI-CAN Frame API

The NI-CAN Frame API offers a powerful interface for accessing NI CAN hardware. The API enables full access to all traffic on CAN and LIN buses. It is a powerful tool for implementing a variety of applications, including CAN and LIN frame-level access, challenge response protocols, remote frame handling, and advanced synchronization.

Bus Monitor

To quickly monitor all CAN and LIN bus traffic, use Bus Monitor, a utility that offers an easy-to-use interface that displays all CAN and LIN frames on the network, and log the traffic to disk. Bus Monitor provides options to control, display, and view bus statistics.

NI Spy

NI Spy is a utility for monitoring NI-CAN API calls made by applications without recompiling or rebuilding. It is ideal for testing application functionality, troubleshooting problems, and verifying communication with CAN devices. NI Spy dynamically captures and displays all NI-CAN API calls made by applications running on the computer.

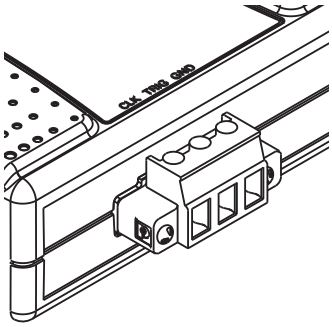

Figure 3. COMBICON Synchronization Connector for USB-847x Devices

Ordering Information

NI USB-8472
1-port, low-speed, USB CAN interface 779790-01

NI USB-8472s
1-port, low-speed, USB CAN interface with synchronization 779791-01

NI USB-8473
1-port, high-speed, USB CAN interface.....779792-01

NI USB-8473s
1-port, high-speed, USB CAN interface with synchronization 779793-01

NI USB-8476
1-port, USB LIN interface.....779794-01

NI USB-8476s
1-port, USB LIN interface with synchronization 779795-01

CAN Device Simulator
U.S. 120 VAC 779189-01
Euro 240 VAC 779189-02
Japan 100 VAC.....779189-07

Cables and Brackets
USB cable strain relief bracket 777550-01
CAN single-termination, high-speed cable, 2 m 192017-02

BUY NOW!

For complete product specifications, pricing, and accessory information, call 800 813 3693 (U.S.) or go to **ni.com/can**.

Specifications

USB Power Requirements

USB-8472(s), USB-8473(s)	250 mA, 5 VDC
USB-8476(s)	200 mA, 5 VDC

Hardware Synchronization

Input clocks	1, 10, and 20 MHz
Output clock	1 MHz
Trigger lines	1 input/output
Clock lines	1 input/output

Examples included for sync to NI-DAQmx, LIN, CAN, and RTSI bus.

Supported Baud Rates

USB-8472(s)	5,000 to 125,000 baud
USB-8473(s)	40,000 to 1,000,000 baud
USB-8476(s)	2,400 to 20,000 baud

Safety

Galvanic CAN channel to USB isolation	500 V
Withstand	2 s maximum

Dimensions

Nonsynchronized versions	7.87 by 6.35 by 2.54 cm (3.1 by 2.5 by 1.0 in.)
Synchronized versions	7.87 by 7.11 by 2.54 cm (3.1 by 2.8 by 1.0 in.)
Cable length	2 m
I/O connector	9-pin male D-Sub, optional 3-pin COMBICON for synchronization

Operating Environment

Ambient temperature	0 to 55 °C
Relative humidity	10 to 90%, noncondensing (tested in accordance with IEC-60068-2-1, IEC-60068-2-2, IEC-60068-2-56)

NI Services and Support

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