NI USB-847x NEW!

- 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% bus load at 1 Mb/s
- ISO 11898 compliant for standard (11-bit) and extended (29-bit) arbitration IDs
- Software-selectable termination for low-speed/fault-tolerant CAN
- J1939 compliant

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

Operating Systems
- Windows XP/2000

Recommended Software
- LabVIEW
- LabWindows™/CVI
- Microsoft Visual C++ 6
- Visual Basic 6
- Borland C/C++

Application Software (included)
- CAN/LIN bus monitoring and logging utility

Driver Software (included)
- NI-CAN

Table 1. USB-847x Selection Guide

<table>
<thead>
<tr>
<th>Model</th>
<th>Physical Layer</th>
<th>Transceivers</th>
<th>Ports</th>
<th>Max Transfer Rate (kb/s)</th>
<th>Hardware Sync</th>
<th>Software Termination</th>
<th>API</th>
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<tbody>
<tr>
<td>USB-8472</td>
<td>Low-speed/fault-tolerant CAN</td>
<td>TJA1054AT</td>
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<td>125</td>
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Overview
National Instruments USB-847x modules 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 available with optional hardware synchronization, you can use two or more NI USB-847x modules together to interface to a wide variety of CAN and LIN networks.

The USB-847x interfaces are ideal for a wide variety of applications, including:
- Monitor and logging in-vehicle networks
- Bus load monitoring
- Device validation with synchronized data acquisition
- CAN device development and test
- Correlating CAN and LIN data 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
The 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.
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 modules 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
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 is fully compatible with the ISO-9141 standard and features baud rates up to 20 kb/s. This device also offers advanced power management through a low-power sleep mode.

Hardware Synchronization
Many automotive applications demand tight integration of CAN, LIN, analog, and digital measurements. In many applications, such as CAN device development and validation, engineers need to synchronize different measurements to correlate data. Engineers 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.

The USB-847x CAN and LIN interfaces are offered with an optional hardware synchronization feature, with which the USB interfaces can share timing and triggering signals with other USB-847x interfaces, along with 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 includes NI-CAN driver software for Windows XP/2000. NI-CAN includes a detailed API and examples for NI LabVIEW, LabWindows/CVI, Microsoft Visual C/C++, Borland C/C++, and Visual Basic 6. 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 provides 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.
CAN and LIN Interfaces for Hi-Speed USB

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.

Specifications

**USB Power Requirements**
- USB-8472, USB-8472s: 250 mA, 5 VDC
- USB-8473, USB-8473s: 250 mA, 5 VDC
- USB-8476, USB-8476s: 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): 5,000 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)

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**Ordering Information**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>NI USB-8472</td>
<td>1-Port, Low-Speed, USB-CAN Interface</td>
</tr>
<tr>
<td>NI USB-8472s</td>
<td>1-Port, Low-Speed, USB-CAN Interface with Synchronization</td>
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<tr>
<td>NI USB-8473</td>
<td>1-Port, High-Speed, USB-CAN Interface</td>
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<td>779189-01</td>
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<td>CAN Device Simulator Euro 240 VAC</td>
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<tr>
<td>CAN Device Simulator Japan 100 VAC</td>
<td>779189-07</td>
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<td>USB cable strain relief bracket</td>
<td>777550-01</td>
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<td>CAN single-termination, high-speed cable, 2 m</td>
<td>192017-02</td>
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</tbody>
</table>

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