PRODUCT DATA

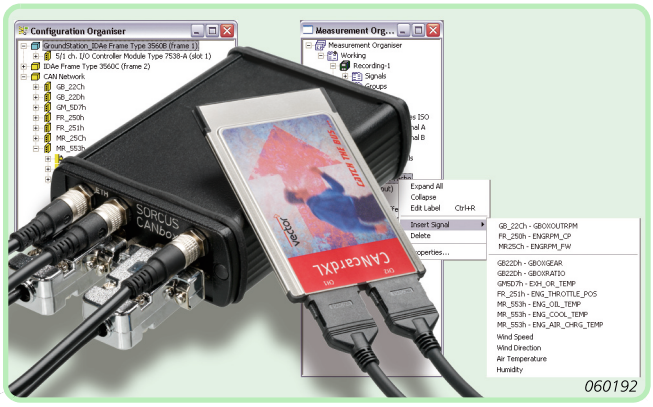
PULSE CAN Bus Option — BZ-5610 with Hardware Option ZH-0678

As the use of CAN buses for control and communication between systems, sub-systems and sensors in industrial environments continues to proliferate, Brüel & Kjær introduces the PULSE™ CAN Bus interface options.

PULSE CAN Bus interface is a combined hardware and software solution for the real-time reading of CAN data from a CAN bus.

Data can be read from high-speed and low-speed (fault-tolerant) CAN bus interfaces and measured in real-time in PULSE along with dynamic channels. CAN data can also be recorded as time histories in the same way as dynamic data for later post-analysis, or rpm values can be obtained from the CAN bus to be used as tracking references for order analysis.

The CAN data is then displayed in PULSE as readouts in a display, as a bar chart (multi-value) or slices (showing changes as a function of time or rpm), as needed.



Uses and Features

Uses

- Reading CAN data into PULSE
- Measurement and display of CAN values
- Measurement and display of vehicle operational parameters
- Documentation of dynamic data with CAN bus information
- Supply of rpm reference for display of order tracking and tagging waterfall data

Features

- Real-time reading and display of CAN data in parallel with dynamic channels
- Recording of CAN data for post-analysis
- Two hardware options for convenience
- Support of high- and low-speed (fault tolerant) buses
- Stand-alone operation – works in the absence of a PULSE front-end
- Use of rpm signals as tracking references for order analysis
- Values can be measured as:
  - Instantaneous
  - Averaged
  - Max. values
- Results available as functions or tags in waterfall data

Introduction

CAN (Controller Area Network) bus is a rugged serial bus system designed for industrial environments, meant to replace bulky wiring harnesses with a two-wire differential cable. Introduced by BOSCH® in 1986 for in-vehicle networks, it is used in myriad applications providing data transmission of operational parameters and control information in factory automation, aerospace, cars, trucks and buses. The CAN protocol is an open standard (ISO 11898).

A CAN bus typically carries most or all of the vehicle operating parameters and in some cases diagnostic information. As most modern vehicles have CAN bus, it has become an extremely convenient means of acquiring vehicle operating parameters used to document your dynamic data without the need for additional sensors and cabling. As it is digital, there is no need to assign units manually or calibrate channels – large amounts of CAN data can be measured with ease with just one or two physical connections to the CAN bus.

CAN Bus Properties

A CAN network consists of nodes distributed around the network. Instructions and data are multi-cast as messages to all nodes on the network. There are four distinct message types:

- Data Frame – Carries information
- Remote Frame – Requests information from other nodes
- Error Frame – Notifies network of erroneous data
- Overload Frame – While this is obsolete, it may be used by older CAN controller models to signify temporary traffic overloads

Each message has an identifier (11- or 29-bit for CAN and extended CAN). This identifier gives details of the contents and the priority of the message. From the identifier, the nodes can filter messages so that they only work with those that are relevant and ignore the rest. The CAN protocol ensures that once a message has been received by a node configured to receive it, the message will be re-broadcast with an additional tag back to the sender node to acknowledge its receipt.

CAN Database (CAN base)

To read and interpret messages, a CAN database (CAN base) needs to be installed. This is an ASCII file containing the key to the CAN identifiers, information on where the data is stored within the CAN message, the units, and the limits. This information is vehicle- or company-specific and required for acquiring CAN bus data. The CAN base also acts to filter out unwanted signals available on the CAN network.

Inside PULSE

CAN is supported throughout LabShop, the core of PULSE software, making CAN bus data available in nearly all PULSE applications. Recordings can be made in the same way as with dynamic data in PULSE.

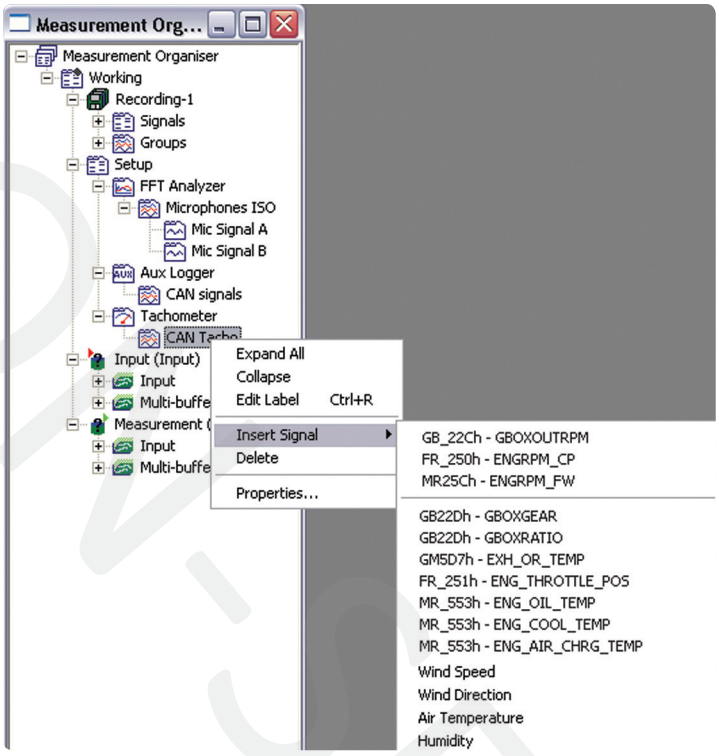


Fig. 1
PULSE interface showing CAN network and signals in the Configuration and Measurement Organisers

The individual CAN signals appear in LabShop complete with signal names and measurement units. The signals can then be monitored in real-time or bar displays, or displayed as slices in waterfall (multi-buffer) data. The values can also be monitored as readout values in the cursor field attached to a display.

CAN data can be processed, where relevant, as a running average, held as a maximum value or, in the case of rpm signals, used together with the PULSE order tracking analyzer as an rpm source.

Values can be saved as functions in PULSE or tags in a waterfall data set and saved together with other PULSE data in the PULSE Data Manager (PDM) database for later retrieval, reviewing and reporting.

Hardware

Brüel & Kjær offers two types of hardware connection modules, a PC card or an external LAN-based unit. With both types of hardware, there are two interface options, either high-speed to high-speed, or high-speed to low-speed. Both modules are delivered with optocouplers providing galvanic isolation from the vehicle CAN network, which terminate in 9-pin, sub-D connectors. Further details of these hardware options can be found in their own literature.

Installation

Using PULSE CAN Bus Option requires software license BZ-5610 installed on each PC with PULSE that will be used, and one of the hardware interface options:

- ZH-0678-001 or -002: CAN to LAN interface
- ZH-0678-003 or -004: CAN to PC Card interface

With these items in place, it is necessary to have a CAN base installed that fits the available messages on the CAN bus. This can be installed on-site to maintain confidentiality.

Specifications – PULSE CAN Bus Option BZ-5610 with Hardware Option ZH-0678-001, ZH-0678-002, ZH-0678-003 or ZH-0678-004

PULSE CAN Bus Option BZ-5610

Supports both versions of CAN hardware, CAN to LAN and PC Card
CAN Database Format: Vector Type CAN database, each CAN interface requires its own database
CAN Data Types Supported: CAN 2.0A and 2.0B,11- and 29-bit identifiers
Update Rate: Determined by CAN Bus interface speed

MEASUREMENT AND DISPLAY MODES
See specifications for Auxiliary Parameter Logging for details (PULSE Software System Data BU 0229)

ACCURACY
Offset: 5 ms
Drift: 80 ppm

ZH-0678-001 and -002 CAN to LAN Interface

Two CAN interfaces, individually galvanically isolated
Options for any combination of high-speed or fault-tolerant interfaces according to drivers installed

COMPLIANCE WITH STANDARDS
CE-mark indicates compliance with EMC Directive

C-Tick mark indicates compliance with the EMC requirements of Australia and New Zealand

EMC Specifications: See hardware documentation for details
Temperature: IEC 60068–2–1 & IEC 60068–2–2: Environmental Testing. Cold and Dry Heat
- Operating Temperature: –20 to +70°C (–4 to +158°F)
- Storage Temperature: –40 to +85°C (–40 to +185°F)

Enclosure: IEC 60529: Protection provided by enclosures: IP 63

PHYSICAL SPECIFICATIONS
Connectors: 9-pin sub-D
Pin Layout: CAN-GND 3, CAN-L 2 and CAN-H 7
LAN Interface: 10/100 on-board
RS-232 serial interface for configuration
RF-proof metal casing
Dimensions: (excl. antenna)
W × H × D: 85 × 36 × 125 mm (3.35 × 1.42 × 4.92″)
Power Requirements: 6 – 60 V DC incl. 42 V automotive

ZH-0678-003 and -004 CAN to PC Card Interface

PC card (Type II) 16-bit
Two independent channels
Connection via galvanically isolated optocouplers with built-in bus drivers to provide any combination of high speed and fault-tolerant interfaces
CAN 2.0 A and B
Plug & Play

COMPLIANCE WITH STANDARDS
EMC Specifications: See hardware documentation for details

PHYSICAL SPECIFICATIONS
Connectors: 9-pin sub-D
Pin Layout: CAN-GND 3, CAN-L 2 and CAN-H 7

Ordering Information

SOFTWARE

BZ-5610-X*	PULSE CAN Bus Option

HARDWARE

ZH-0678-001	CAN to LAN Interface Unit, Fast-Slow (one fault tolerant interface and one high-speed interface)
ZH-0678-002	CAN to LAN Interface Unit, Fast-Fast (two high-speed interfaces)
ZH-0678-003	CAN to PC Card Interface Unit, Fast-Slow (one fault tolerant interface and one high-speed interface)
ZH-0678-004	CAN to PC Card Interface Unit, Fast-Fast (two high-speed interfaces)

ZH-0678-001 and -002 Include:
- LAN adaptor cable
- Serial (RS-232) interface adaptor cable
- Power cable
- AC power supply
- Two 9-pin sub-D terminated connection cables
- Software disk with instruction manual and Control Programme

ZH-0678-003 and -004 Include:
- Two optocouplers terminating in 9-pin sub-D connectors
- Software disk with Windows® drivers

SOFTWARE MAINTENANCE AND SUPPORT

M 1-5610-X*	PULSE CAN Bus Option Software Maintenance and Upgrade License

* Where ‘X’ indicates the license model, either N: Node-locked or F: Floating

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