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DATA SHEET

*lab*DX (Code 3741)

Digital input module with CAN FD, FlexRay, HMS, and pulse interfaces

Overview

The digital module *lab*DX has one interface for two CAN FD/CAN respectively two OBD-2 and one FlexRay inputs, two pulse inputs and one HMS interface for connecting and controlling an artificial head of the HMS III or HMS IV generation or for connecting a GPS receiver.

The pulse inputs are highly flexible. Users decide whether to record short pulses without DC offset or long pulses with a floating DC offset.

The premium and flexible module *lab*DX can be easily connected to other modules and forms a stable and easily-manageable unit.

Features

- Input module with digital inputs

Connections to front ends from HEAD acoustics

- *lab*CTRL I.2 (HEAD*lab* controller)
- *lab*COMPACT12 / *lab*COMPACT24 (compact systems)
- MMF III.0 / MMF III.0-V1 (Brake*OBSERVER* front ends)
- VFE II.1 / VMA II.1 / VMA III.0 (HEAD VISOR arrays)

Connections for sensors

- Interface for two CAN FD/CAN/ OBD-2 inputs and one FlexRay input
  (for the use of the second CAN FD, CAN, OBD-2 and the FlexRay input, the adapter cable CMD 0.12 is required)
  - A user-specific CAN FD/CAN/ OBD-2 respectively FlexRay cable is additionally required
  - Depending on the FlexRay or CAN FD data rate, other channels (HMS, pulse, ...) are reserved for recording FlexRay or CAN FD data
- Two pulse inputs, separately configurable, for recording of
  - a high maximum pulse rate (without signal conditioning)
  - a low maximum pulse rate (with signal conditioning and offset compensation)
- HMS interface
  - for connecting and controlling one artificial head of the HMS III or HMS IV generation
  - for connecting the GPS receiver CDB I.1

Functions

- 7 W power consumption
- Electrical isolation of *lab*DX inputs to inputs of other HEAD*lab* modules and the PC interface

Handling

- Silent (no fan), rugged design
- Integrated locking mechanism (the modules can easily be mated to a system)

Scope of supply

- *lab*DX (Code 3741)
  Digital module with CAN FD, FlexRay, HMS, and Pulse interfaces

Optional

- CLL X.xx (Code 3780-xx)
  Cable HEAD*link*
  LEMO 8-pin ↔ LEMO 8-pin
  [*lab*DX ↔ *lab*CTRL I.2]
- *lab*CTRL I.2 (Code 3702)
  LAN / USB controller
- CDX X.3 (Code 3783-3)
  Connection cable for HMS, 3 m (118“)
- CDO X.3 (Code 3786-3)
  Connection cable for OBD-2, 3 m (118“)
- CMD 0.12 (Code 3788)
  Adapter cable D-Sub ↔ 3 x D-Sub (CAN FD/CAN 1, CAN FD/CAN 2, FlexRay), 12 cm (4.7“)
- CDG I.1 (Code 3796)
  GPS receiver
- PDB II.1 (Code 3716)
  Passive Power Distribution Box for connecting up to 4 artificial heads of the HMS III and the HMS IV generation
- For extracting individual CAN FD, CAN, OBD-2, or FlexRay quantities, ArtemiS SUITE Data Preparation Module ASM 24 (Code 5024) is required

Technical Data

General

Number of channels:	Simultaneously, max. 6 channels (from 7) are available
Power consumption:	7 W at 24 V
Input voltage:	10 to 28 V
Cooling:	Convection, no fan
Dimensions incl. BNC connectors: incl. locking mechanism and rubber pads:	 140 x 180 x 42 mm (WxDxH) (5.5" x 7.1" x 1.7") 148 x 180 x 48 mm (WxDxH) (5.8" x 7.1" x 1.9")
Weight:	642 g (1.41 lb)
Operating temperature:	-10 °C to 60 °C (14 °F to 140 °F)
Storage temperature:	-20° C to 70° C (-4 °F to 158 °F)

Pulse Inputs

Number of channels:	2 (BNC)	
Maximum input level:	50 V	
Short pulses (without signal conditioning) voltage threshold:	Ca 1 V	
Long pulses (with signal conditioning) Rectangular signal (50 % duty cycle) Input level V_{PP}: Lower cut-off frequency: Upper cut-off frequency:	 60 mV_{PP} Ca 25 Hz Ca 25 kHz	 1000 mV_{PP} Ca 3 Hz Ca 600 kHz
Long pulses (with signal conditioning) Sinus signal Input level V_{PP}: Lower cut-off frequency: Upper cut-off frequency:	 60 mV_{PP} Ca 100 Hz Ca 25 kHz	 1000 mV_{PP} Ca 1 Hz Ca 600 kHz
Pulse sampling frequency:	1.152 MHz	
To process signals from open-collector outputs, a 1 kOhm pull-up resistor can be added separately for each pulse input.		

CAN FD/CAN/OBD-2 / FlexRay Inputs

Interfaces:	3 (2 x CAN FD/CAN/OBD-2 / 1 x FlexRay)
FlexRay and CAN FD may have a variable bandwidth. Depending on the data rate, other channels (HMS, Pulse, ...) are automatically reserved for recording FlexRay or CAN FD data if necessary (FlexRay up to 6 channels, CAN FD up to 4 channels).	
Interface:	D-Sub 9-pin
CAN:	CAN high speed according to ISO 11898-2
Bit rate CAN bus: CAN FD bus:	 1 Mbit/s, 500, 250, 125, 100, 50, 20, 10 kbit/s 4, 2, 1 Mbit/s, 500 kbit/s
Identifier (CAN):	11 bits (CAN 2.0A), 29 bits (CAN 2.0B)
Decoding/display of CAN FD/CAN signals CAN FD/CAN signals: OBD-2 signals via CAN according to ISO 15765-4:	 Decoding/display of current vehicle quantities according to vehicle-specific DBC databases (not included) Request/display of standardized, current vehicle quantities (corresponding DBC databases are included)
FlexRay (A+B):	FlexRay V2.1 Rev. B; a vehicle-specific XML Fibex database is required (not included)
For CAN FD/CAN and FlexRay, line termination can be switched on and off separately via software.	

HMS Inputs

Number of channels:	2
Resolution:	24 bit
Interfaces:	D-Sub 9-pin (HMS via AES/RS232)
Connecting a GPS receiver:	CDG I.1
Via HMS input, a voltage supply of 5 V / 500 mA is available.	

HEAD*link* Interface (HEAD acoustics standard)

Controlling / data transfer / power supply via controller	LEMO 8-pin