



## Features

### Connections to frontends from HEAD acoustics

- *labCTRL II.1/labCTRL I.2* (HEADlab Controller)
- *labHSU*  
High-end dual-channel data acquisition system
- *labCOMPACT12-V1/ labCOMPACT24-V1* (compact systems)
- HMS V (artificial head measuring systems)
- MMF III.0/MMF III.0-V1 (BrakeOBSERVER frontends)

### 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/FlexRay input, the adapter cable CMD 0.12 is required)
  - A user-specific CAN FD/CAN/OBD-2/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 *labDX* inputs from inputs of other HEADlab 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

- *labDX* (Code 3741)  
Digital input module with CAN/CAN FD/FlexRay, HMS, and pulse interfaces

### Optional

- CLL X.xx (Code 3780-xx)  
Cable HEADlink  
LEMO 8-pin ↔ LEMO 8-pin
- CDX X.3 (Code 3783-3)  
Connection cable for HMS, 3 m

## DATA SHEET

### *labDX* (Code 3741)

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

### Overview

The digital module *labDX* has one interface for two CAN FD/CAN/OBD-2, and one FlexRay input, 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 high-quality and flexible module *labDX* can be easily connected to other HEADlab modules and forms a stable and easily-manageable unit.

- CDO X.3 (Code 3786-3)  
Connection cable for OBD-2, 3 m
- CMD 0.12 (Code 3788)  
Adapter cable D-Sub ↔ 3 x D-Sub (CAN FD/CAN 1, CAN FD/CAN 2, FlexRay), 12 cm
- 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/FlexRay quantities, the Decoder ASM 09 (Code 5009) of ArtemiS SUITE is required

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## Technical Data

### General

Number of channels:	Simultaneously, max. 6 channels (from 7) are available
Power consumption:	7 W at 24 V
Input voltage:	10 V to 28 V
Cooling:	Convection, no fan
Dimensions incl. BNC connectors: incl. locking mechanism and rubber pads:	140 x 180 x 42 mm (W x D x H) 148 x 180 x 48 mm (W x D x H)
Weight:	642 g
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 <sub>PP</sub> Ca 25 Hz Ca 25 kHz	1000 mV <sub>PP</sub> 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 <sub>PP</sub> Ca 100 Hz Ca 25 kHz	1000 mV <sub>PP</sub> Ca 1 Hz Ca 600 kHz
Pulse sampling frequency:	1.152 MHz	

To process signals from open-collector outputs, a 1 k $\Omega$  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	
Data rate CAN: Data rate CAN FD:	1 Mbit/s, 800, 666, 500, 250, 125, 100 kBit/s 5, 4, 2 Mbit/s (backwards compatible with CAN: 1 Mbit)	
Identifier (CAN):	11 bits (CAN 2.0A), 29 bits (CAN 2.0B)	
Decoding/display 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.

### HEADlink Interface (HEAD acoustics standard)

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