

CoachLab

Description D005

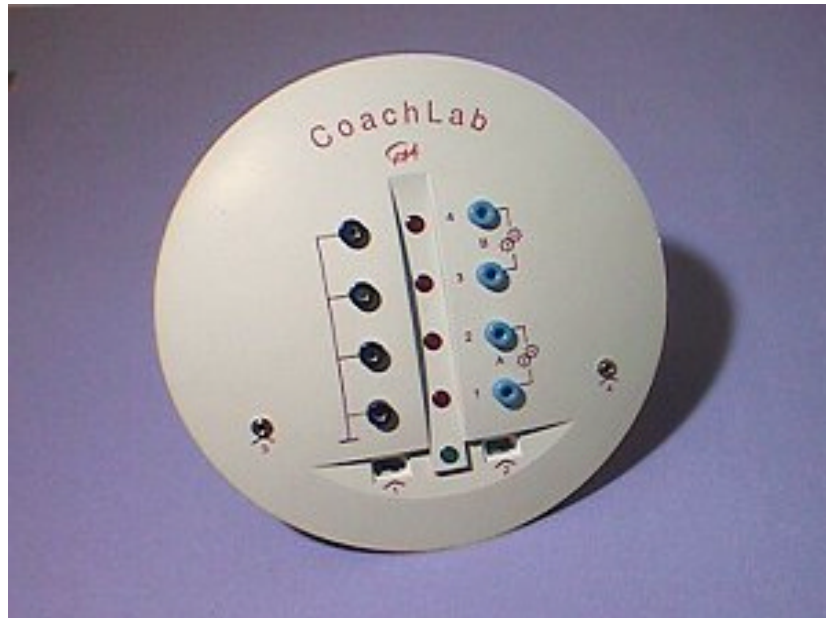


Figure 1. CoachLab interface

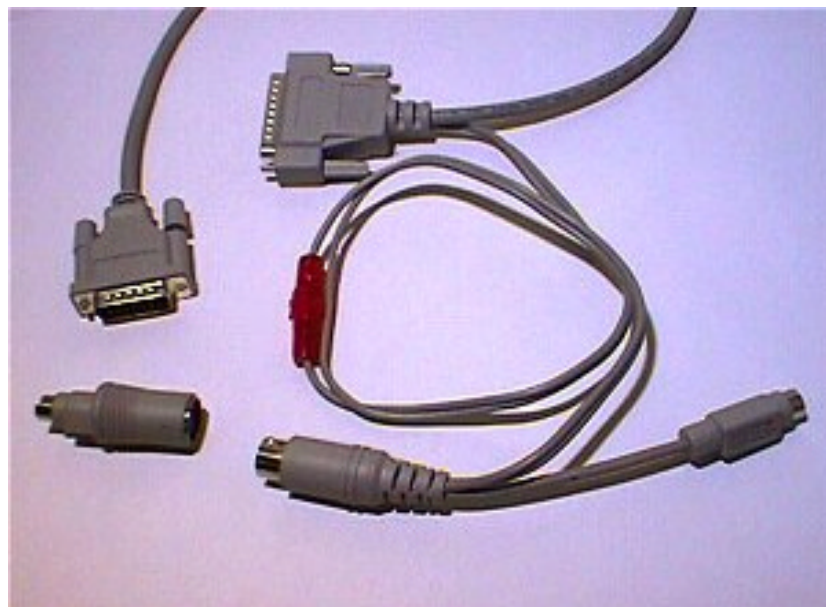


Figure 2. Parallel port cable with keyboard connector (included).

Short description

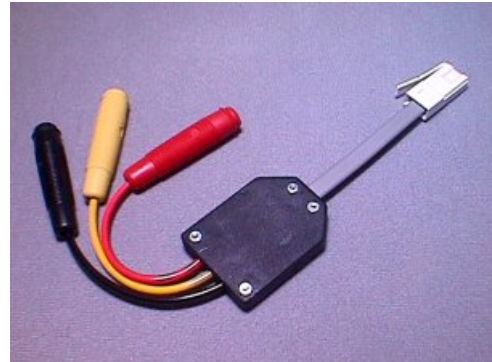
CoachLab is a multifunctional interface, which offers the possibility to measure and control with a computer. The interface is connected to the computer by means of the parallel port. The measuring part and the internal electronics are powered by the keyboard's power supply.

When you also want to use control tasks (e.g. to drive a motor), then it is necessary to power CoachLab via an external mains adapter (optional, art. nr 0865). All sensors (except for the microphone) are connected with so-called British Telecom plugs, which can be inserted only in one way.

For connection of the 4-mm CMA sensors, an adapter plug exists (optional, art. nr. 519).

CoachLab is controlled by the software package *Coach 5*.

This manual contains instructions to safely connect CoachLab to a computer.¹



Adapter to connect sensors with 4-mm plug to the BT inputs (0519).

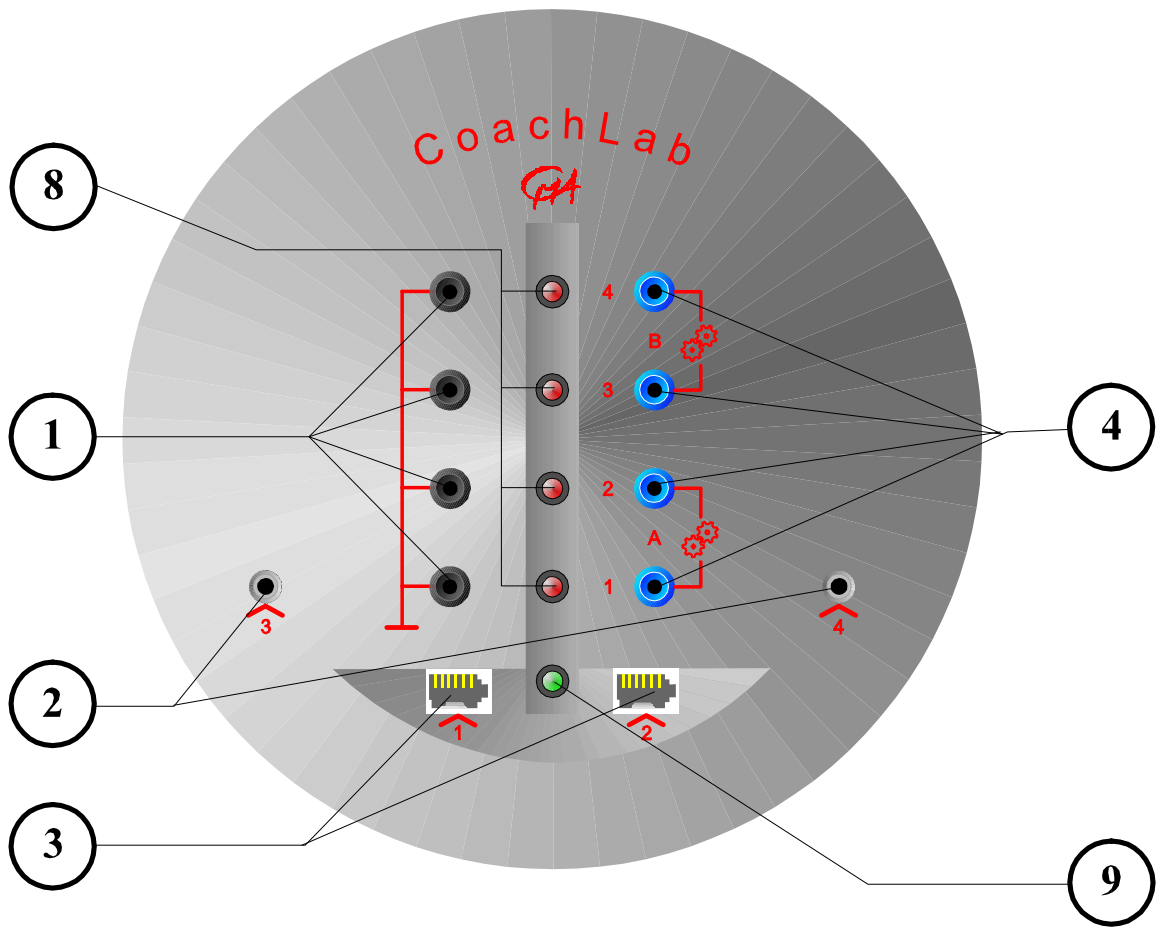
Description of CoachLab

CoachLab has the following features (see figure 3):

1. The earth of the digital outputs (for control). These grounds are connected through to each other.
2. Two microphone-inputs (for measuring). The microphone is the only sensor connected to CoachLab through a 3.5 mm plug.
3. Two inputs for analog sensors (for measuring).
4. Four digital outputs (for control).
5. The input for the plug of the external mains adapter. Via this plug, the control part of the interface is fed (see figure 4).
6. The plug for connection with the parallel port of the computer (see figure 4).
7. An extension connector - not used.
8. Red LEDs showing the status of the digital outputs.
9. A green LED which lights up when CoachLab is connected correctly to the computer.

¹ CMA does not accept any responsibility for damage to the computer when CoachLab is not connected conform the instructions given in chapter "Connecting CoachLab to the computer".

Top view



Rear view

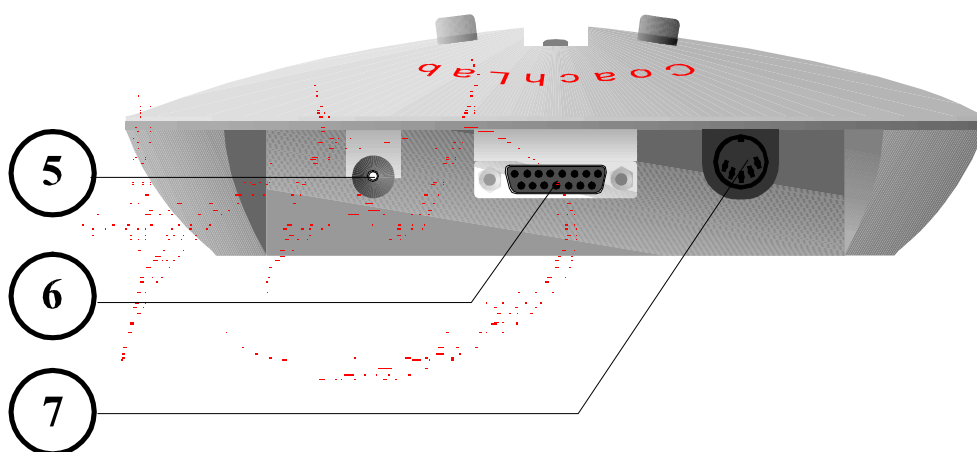


Figure 3. The different parts of CoachLab (numbers refer to the text).

Connecting CoachLab to the computer

To connect CoachLab to the computer precisely follow the instructions below (see also figure 2):

- **Switch the computer off before connecting CoachLab!**
- Connect the 15-pin plug to CoachLab;
- Connect the 25-pin plug to the parallel port of the computer;
- Remove the keyboard plug from the computer and connect this, via the adapter plug, to the fitting keyboard plug of the CoachLab cable. With these plugs, it is also possible to connect computers and/or keyboards with a small keyboard plug;
- Connect the cable's other 5-pin plug to the computer's keyboard input.
- Switch the computer on again.

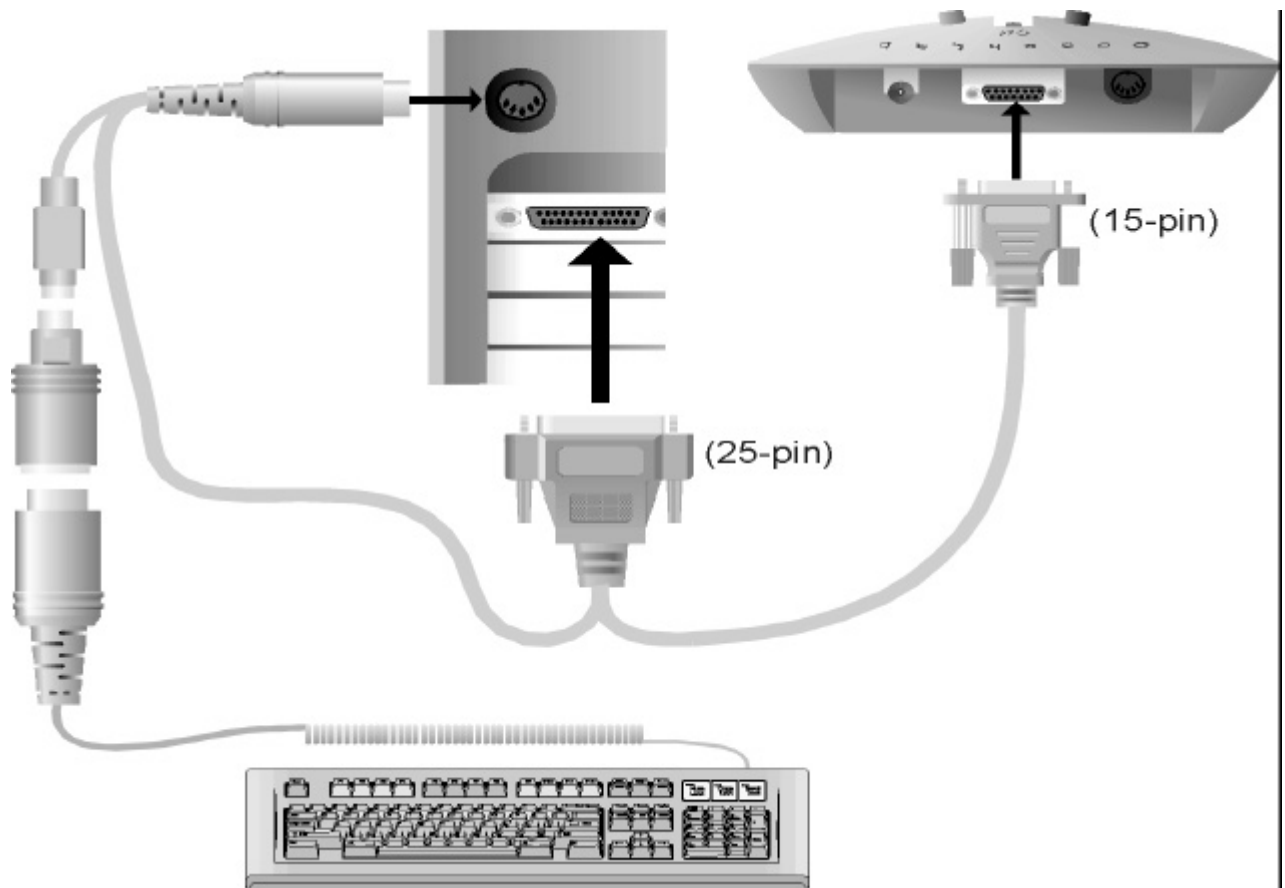


Figure 4. Connecting CoachLab to the computer.

The most common configuration has been drawn in the figure. Some types of computer, however, use the small plug to connect the keyboard. In that case, put the adapter plug into the computer and connect the cable's small plug to the keyboard.

Connecting CoachLab to the external mains adapter

When you also want to make use of CoachLab's digital outputs for control processes, it is necessary to connect the external power supply.

Be careful to use the plug with the correct polarity, otherwise CoachLab can be damaged beyond repair.

When connecting apparatus (e.g. bulbs or motors) to the outputs, it is important to take into account the maximum current (1 A) that CoachLab can handle (because of cooling the generated heat). Each output to which something is connected counts!

Some examples:

- A single 0.5 A motor connected to outputs 3 and 4 (for two rotational directions) loads CoachLab with 1 A (because of connection to both outputs). It is not possible to connect more equipment at the same time.
- A stepper motor of 0.1 A connected to all four digital outputs loads CoachLab with 0.4 A.
- One single bulb of 0.25 A connected between one output and the earth loads CoachLab for 0.25 A. Four of these can be connected at the same time.

It is not possible to feed CoachLab solely via the external power supply. The internal electronics and the sensors must be fed by the keyboard connector.

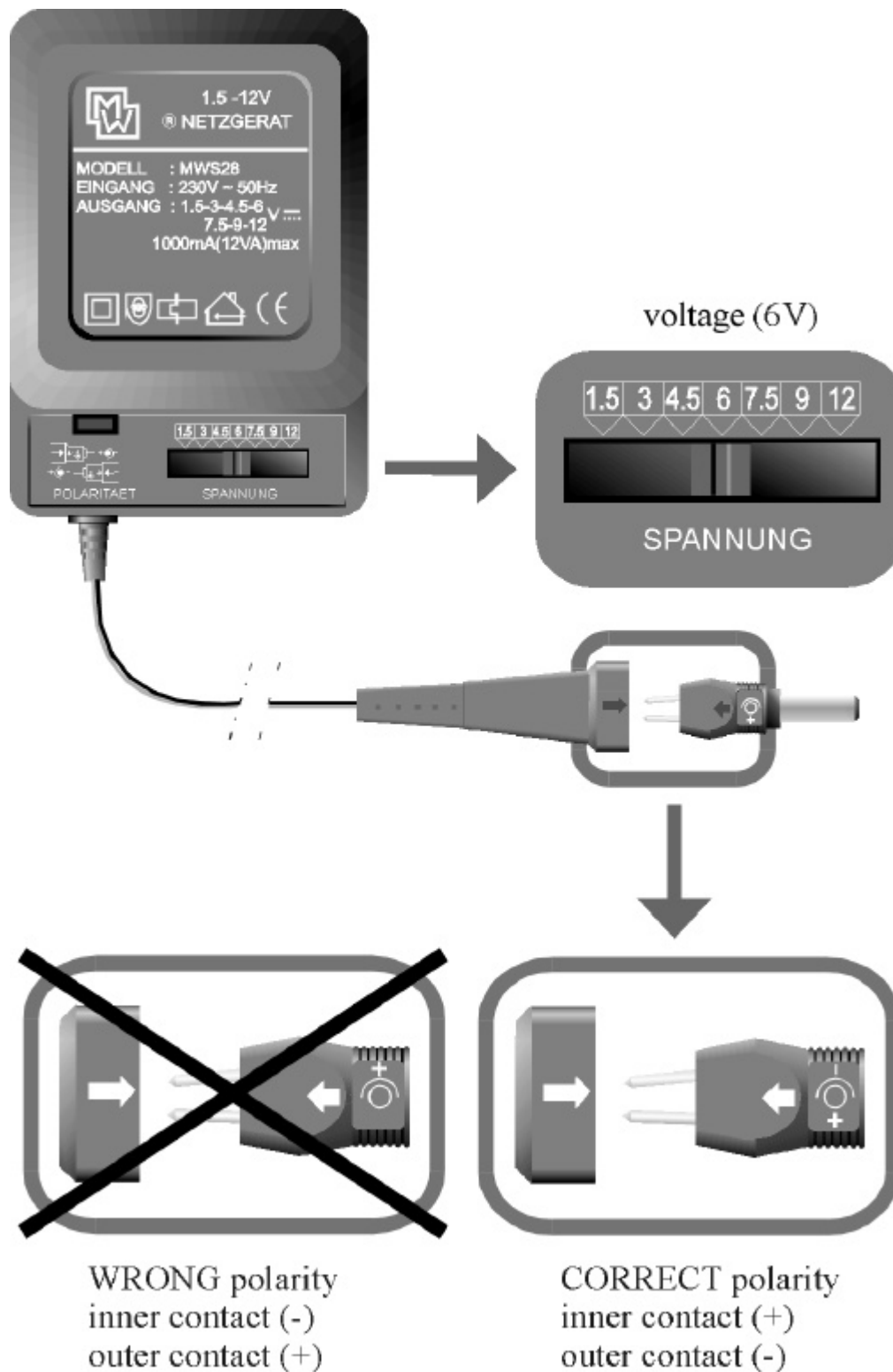


Figure 5. Connection of the external power supply to CoachLab for feeding the digital outputs. **Using the wrong polarity may damage Coach Lab beyond repair!**

Technical Specifications

Connection to the computer

Connection with a 15-pin D-connector (female), via included cable;

- to the parallel port for data transmission;
- to the keyboard input for power supply (connect keyboard to the CoachLab cable).

Maximal current (from the computer): 140 mA.

The +5 V power has been fused with a fast fuse (5x20 mm) of 1A in a cable holder.

External power supply

Mains adapter with DC-plug 2.5 mm, (+)-pole at the inner contact. This external power supply only feeds the outputs.

Minimal voltage required: 5 V; Maximal voltage: 24 V.

Power supply is fused via a fast fuse (5x20 mm) 2 A on the print.

Outputs

The four outputs are connected to the (+) or (-)-pole of the external power supply via software control.

Maximal current drain per output: 0.6 A (continuously)

Maximal current drain for all outputs together: 1.0 A (continuously)

Inputs

- AD converter
Resolution: 12-bit;
Maximal sample frequency: 10 kHz. Conversions on software command.
- Microphone inputs
Range: 7.5 mV; Input impedance: 10 k Ω ;
Frequency range: 15 Hz - 7 kHz (-3 dB points).
- Sensor inputs
Range: 0-5 V; Input impedance: 100 k Ω ;
Frequency range: DC - 10 kHz (-3 dB point);
Pull-up resistance for NTC: 15 k Ω ;
Pull-up resistance for sensor identification: 10 k Ω ;

Indicator LEDs

Green LED: CoachLab correctly connected and fed by computer.

Red LEDs: status of the digital outputs. The outputs are kept reset if *no* External power supply has been connected. Software commands to the outputs do not have any effect; LEDs do not light up.

Size: \varnothing approx. 21 cm, height: approx. 3.5 cm;

Weight: approx. 370 g

Specifications of the cable

| 15-pin male | | 25-pin male | | Keyboard plug |
|--------------------|-----------------|--------------------|--------|----------------------|
| 1 | GND (keyboard) | | | GND |
| 2 | D0 | 2 | D0 | |
| 3 | D1 | 3 | D1 | |
| 4 | D2 | 4 | D2 | |
| 5 | D3 | 5 | D3 | |
| 6 | ACK | 10 | ACK | |
| 7 | BUSY | 11 | BUSY | |
| 8 | GND (keyboard) | | | GND |
| 9 | +5 V (keyboard) | | | +5 V |
| 10 | STB | 1 | STB | |
| 11 | AUTOFD | 14 | AUTOFD | |
| 12 | GND | 18-25 | GND | |
| 13 | INIT | 16 | INIT | |
| 14 | SLCTIN | 17 | SLCTIN | |
| 15 | +5 V (keyboard) | | | +5 V |

The pins 6-9, 12, 13 and 15 of the 25-pin plug have not been connected through.

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