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ZU-DBD

Demo Board

Illustrative Measurement.

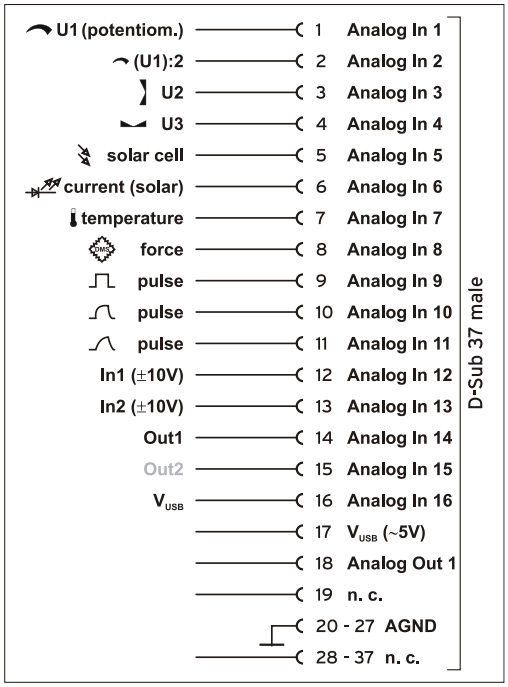
Voltage signals and other physical quantities (e.g. pressure, temperature, light intensity) can be presented with the demo board ZU-DBD. Equipped with various operating controls and sensors, both static and dynamic analog signals are generated.

Connection to the DAQ System.

The demo board has been optimized for using it with the DAQ systems USB-AD14f and USB-AD from bmcm and is therefore only available with one of these DAQ systems. It is connected to the analog channels (16 AIn, 1 AOut) of the PC data acquisition system at the 37-pin D-Sub male.

Supplied by USB. So Easy.

An external power source is not necessary. The ZU-DBD uses the power of the USB interface provided by the PC data acquisition system with app. 5V to produce the demo signals.



In Service for Education.

As basics of electrical engineering and measurement technology (e.g. electric circuits, functionality of electric components) can easily be demonstrated with the ZU-DBD, it is perfectly suitable to impart knowledge about PC measurement at schools and other training centers.

Intuitive. Compact. Well-Priced.

Teaching material in the field of schooling and training must be easy to use, handy, robust, and cost-effective. When developing the ZU-DBD, we set a great value on meeting these demands.

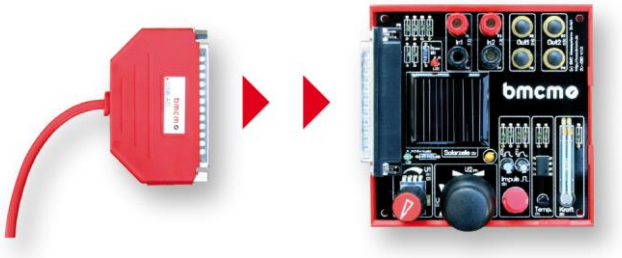
Easily Operated.

A potentiometer for adjustable voltages, a joystick for 2-axial signals, a push-button to generate pulses, a strain gage sensor for pressure measurement - these are just a few features of the demo board to explain fundamental terms of measurement technology.

Simply NextView®.

The data acquisition software NextView® is a perfect complement to the measurement hardware. The signals produced with the demo board can directly be visualized online as graphic curves or be recorded. A free NextView® project specially created for the ZU-DBD is provided on the bmcm website.

1 Start-up Procedure



Use a D-Sub connection cable (ZUKA-37SB cable available as accessory) to connect the ZU-DBD via the D-Sub 37 male to the PC data acquisition system. The USB data acquisition system USB-AD can also be attached directly to the ZU-DBD.
Connect the DAQ system to the PC via the USB interface. At first-time connection, the Plug & Play installation for the DAQ system has to be done first.
If necessary, further software components, which are to be used with the device, can be installed then (e.g. DAQ software NextView®4).
The ZU-DBD is supplied by the USB interface with app. 5V. This is indicated by the green LED "LD1".

2 Connections and Operating Elements

The provided connections and operating elements of the ZU-DBD demo board are shown in the following figure of the board (view on top of the board (fitted with components), D-Sub 37 male of the left).

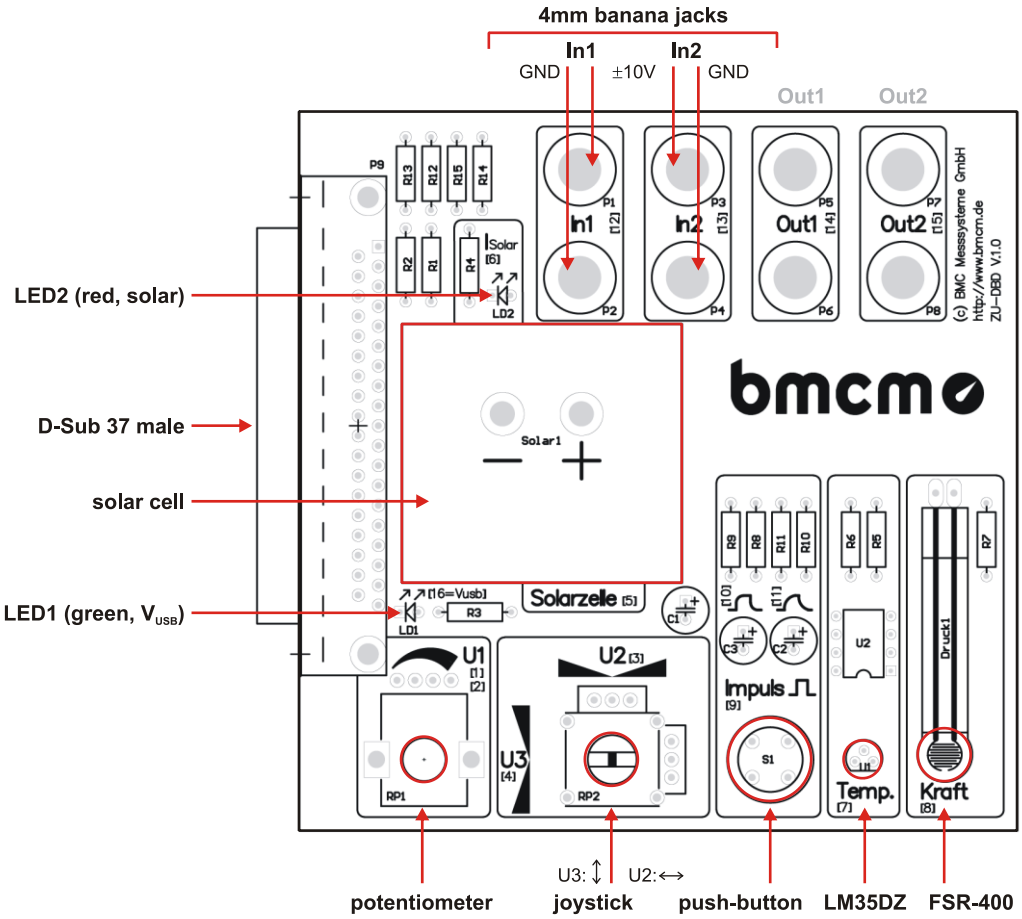
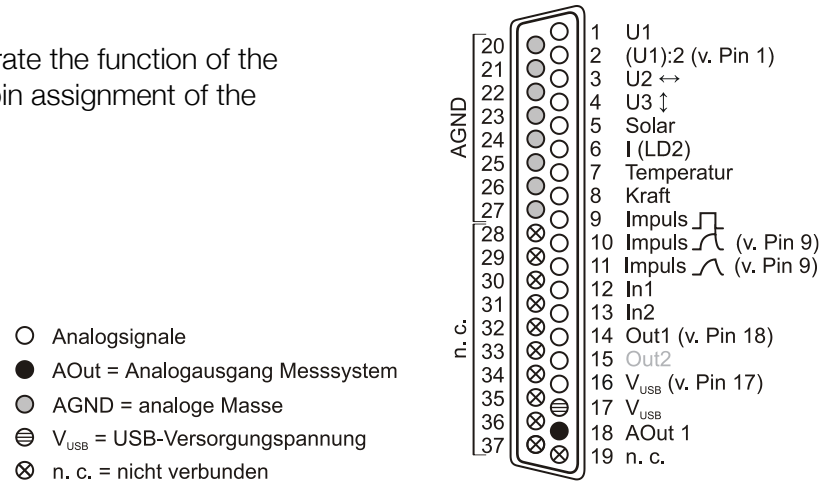


Figure 1

3 Function Description

The following table and graphics illustrate the function of the different operating elements and the pin assignment of the D-Sub 37 male.



Pin	Name	Function / Details
1	U1	Signal 1 continuously adjustable with turning knob (potentiometer, 10kΩ) between 0 .. V_{USB}
2	(U1):2	Signal 2 continuously adjustable with potentiometer between 0 .. $V_{USB}/2$; signal 2 is generated by halving signal 1 by means of a voltage divider
3	U2	Signal 3 adjustable in the range of 0 .. V_{USB} by moving the joystick (potentiometer, 10kΩ) in x-direction; middle position: $V_{USB}/2$
4	U3	Signal 4 adjustable in the range of 0 .. V_{USB} by moving the joystick (potentiometer, 10kΩ) in y-direction; middle position: $V_{USB}/2$
5	Solar	Signal 5 is produced by the solar cell (monocrystalline, 4V/0.35mA): 0V $\hat{=}$ 0%; 4V $\hat{=}$ 100%
6	I (LD2)	Signal 6 indicated the current flowing through the red LED (LD2, avalanche voltage 1.6V), supplied by the solar cell (signal 5), 100Ω resistor
7	Temperature	temperature measurement with semi-conductor sensor LM35DZ and downstream operational amplifier: 0V $\hat{=}$ 0°C; V_{USB} $\hat{=}$ 100°C
8	Force	Force measurement with strain gage FSR-400; 10g - 10kg (non-linear)
9	Pulse ⎍	Signal 9 is a pulse signal with rising edge, the pulses from 0V to V_{USB} are generated by pressing the push-button
10	Pulse ⎎	Signal 10 is a damped pulse signal from 0V to $V_{USB}/2$ produced by signal 9 with RC-circuit (100µF capacitor) and 10kΩ resistor (voltage divider)
11	Pulse ⎎	Signal 11 is a highly damped pulse signal from 0V to $V_{USB}/2$ produced by signal 9 with RC-circuit (220µF capacitor) and 10kΩ resistor (voltage divider)
12	In1	Signal 12 results from an external voltage signal, which can be applied at two 4mm banana jacks; ±10V input range extended by 2x 10kΩ resistors (voltage dividers)
13	In2	Signal 13 results from an external voltage signal, which can be applied at two 4mm banana jacks; ±10V input range extended by 2x 10kΩ resistors (voltage dividers)
14	Out1	Signal 14 is connected with the analog output (AOut1, pin 18) of the DAQ system (USB-AD or USB-AD14f)
15	Out2	is not used at the moment, as the compatible DAQ systems do not feature a second analog output
16	V_{USB}	Signal 16 is connected with pin 17 and outputs the supply voltage V_{USB} (4 .. 5V, max. 20mA) of the USB interface; the green LED (LD1) is on during operation
17	V_{USB}	Auxiliary voltage (4 .. 5V, max. 20mA) of the USB interface provided by the DAQ system; used to supply the ZU-DBD
18	AOut 1	±5V analog output of the USB-AD or USB-AD14f
19	n. c.	without function
20 ..27	AGND	analog ground
28 ..37	n. c.	without function

4 Important Notes for Using the ZU-DBD

- The ZU-DBD is only suitable for extra-low voltages – please observe the relevant regulations!
- The ground of the demo board is electrically connected to the chassis of the PC, which is usually also connected to ground. Be sure to avoid ground loops since they will cause measuring errors!
- All accessible pins are electrostatic sensitive devices. Additional power supply is not necessary.
- Only use non-solvent detergents for cleaning. The product is designed to be maintenance-free.
- The board must not be used for safety-relevant tasks. With the use of the product, the customer becomes manufacturer by law and is therefore fully responsible for the proper installation and use of the product. In the case of improper use and/or unauthorized interference, our warranty ceases and any warranty claim is excluded.

Do not dispose of the product in the domestic waste or at any waste collection places. It has to be either duly disposed according to the WEEE directive or can be returned to bmcm at your own expense.

5 Technical Data

(typ. at 20°C, after 5min., +5V supply)

Operating elements:	turning knob (potentiometer, mono, 10kΩ), joystick (3D potentiometer, 10kΩ), push-button
Sensors:	solar cell (monocrystalline, 39mm x 35mm, 4V/35mA), temperature sensor LM35DZ (0 .. 100°C), force/pressure sensor FSR-400 (10g .. 10kg)
LEDs	LED1: green, 2mA, powered by V_{USB}; LED2: red, 2mA, powered by solar cell, avalanche voltage 1.6V
Signal connection:	In1 and In2 at two 4mm banana jacks each (red: ±10V; black: GND)
Connection to the DAQ system:	at 37-pin D-Sub male
Power supply:	app. 4 .. 5V from USB port of the PC, provided by pin 17 of the DAQ system, max. 20mA
Compatible DAQ systems:	USB-AD, USB-AD14f from bmcm
CE standards:	EN61000-6-1, EN61000-6-3, EN61010-1; for decl. of conformity (PDF) visit www.bmcm.de
ElektroG // ear registration:	RoHS and WEEE compliant // WEEE Reg.-No. DE75472248
Max. permissible potentials:	**60V DC acc. to VDE**, max. 1kV ESD on open lines
Temperature ranges:	operating temp. 0..70°C, storage temp. –25..+85°C
Relative humidity:	0-90% (not condensing)
Dimensions (L x W x H):	108mm x 105mm x 46mm
Delivery:	board in plastic holding fixture, description
Available accessories (optional):	connection cable ZUKA37SB
Software:	NextView® project for ZU-DBD (free download at: www.bmcm.de/us)
Warranty:	2 years from date of purchase at bmcm, claims for damages resulting from improper use excluded