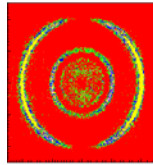# The USB-IO2 DA-controller

RoentDek Handels GmbH

Supersonic Gas Jets
Detection Techniques
Data Acquisition Systems
Multifragment Imaging Systems

The **RoentDek USB-IO2** is a unit for digitally setting analogue voltages (-5V to +5V). It is controlled via USB by a PC (USB2.0 ports recommended[*]). Simple C++ example code, a LabView example and a control GUI for Windows10 OS is available, direct integration into the data acquisition software *CoboldPC* can be provided.

The **USB-IO2** is integrated in certain **RoentDek CFD8/7x** modules for threshold setting control.
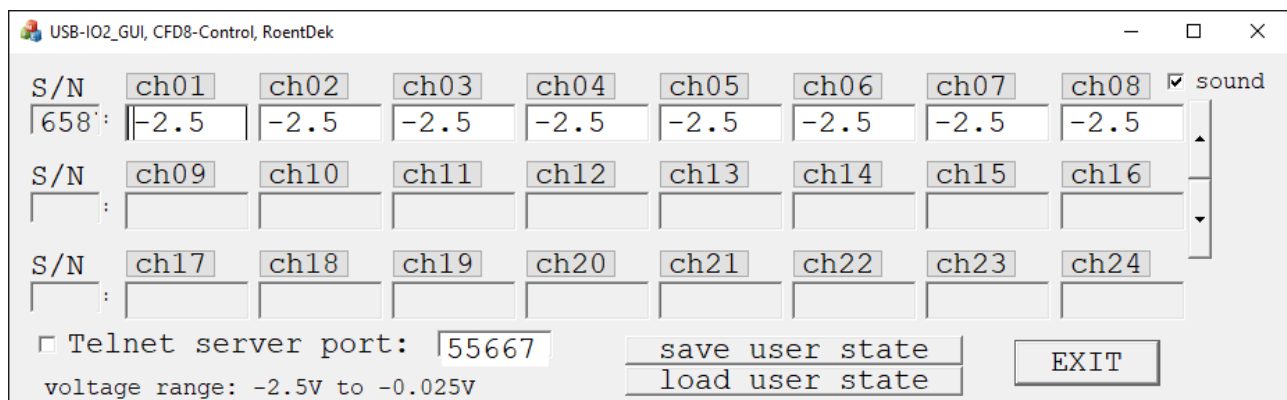
Summary of features:
- 8 analogue outputs (-5 to +5V)
- output range factory-fixed by internal jumpers:
  ± 0-2.5V, ± 0-5V, ±2.5V, ±5V, <u>do not change!</u>
- output current: max. 6mA per channel
- resolution: input 12bits
- accuracy: ±2 LSB
- operating temp.:   0 °C to 70 °C

Driver installation:
Please install the driver with the filename :
USB-DA12-8E Install_RoentDek-2020-07-06.exe,
as provided by **RoentDek**

The software ***USB-IO2_GUI.exe*** allows controlling up to 24 channels of 3 external (see figure above) or CFD-integrated **iUSB-IO2** units. The software recognizes each connected unit and will display the corresponding serial numbers according to the label on its case (for **iUSB-IO2** units the CFD serial number is relevant, the addressable voltage range limited from -25 mV to -2.5 V here, see figure below).

Set values can be stored in a file on disc and individually in an internal EPROM of any connected **USB-IO2** unit, also the last settings after program termination is automatically stored. Previously set or earlier-stored output levels will be maintained as long as the unit is powered. In case of CFD-integrated units the power state is determined by the main on/off switch on the CFD case. The internal unit will maintain the last setting even when the USB cable is removed.

Operation via USB hubs is supported but may not always be functional depending on the hardware.

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[*] some PC brands may not support **USB-IO2** operation on all USB ports.

Operation of the *USB-IO2_GUI.exe* program:

The program will automatically recognize connected devices. Connecting/disconnecting devices while the program is running is supported. The software stores the last state in a local file and restores this state at start up. Up to 3 devices are supported.

Voltages can be entered manually by selecting the entry field of a channel number with the mouse pointer (field turns yellow), then entering digits, followed by the return key (yellow background disappears to prompt the new setting). Voltage settings can be re-loaded from the local user state file.

In case of invalid entry (i.e. value beyond supported range), the field will turn red while the setting change is ignored*. Other possible entries are "h" and "l" to set the highest, respectively lowest value.

Alternatively, the two arrow buttons on the right can be used, or the up/down arrow keys.

Clicking on the channel labels will cause them to change color. Such-marked channels will be grouped and are controlled synchronously if any of the corresponding field entries is changed.

The program can act as a simply TELNET-server that accept external commands. The following commands are supported:

Command arguments:

module_index	can range from 0 to 2
module_channel_index	can range from 0 to 7
channel_index	can range from 0 to 23

List of commands:

exit
Function: closes the program and stores last state of settings.

get_voltage *channel_index*
get_voltage *module_index*, *module_channel_index*
get_voltage *module_serial*, *module_channel_index*
Function: reads back the currently set voltage

set_voltage *channel_index*, *voltage*
Function: sets a new voltage

CFD_serial *serial*
Function: sets the serial for subsequent/following commands

CFD_threshold *module_channel_index*, *voltage*
Function: sets a new voltage
                 (the serial number must have been set before using the command **'CFD_serial'**

TELNET_server_port *port*
Function: closes the TCPIP-server and restarts it on a different port.

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* Exceptions for CFD-integrated units: Entry of 0 will be interpreted as -0.025, entry of positive values will be negated.