

► Interface Box IFU 2.1 User Manual

V6805



HPLC

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Note: For your own safety, read the manual and always observe the warnings and safety information on the device and in the manual.

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Intended Use

Interface box IFU 2.1 solely supports connections with USB 2.0 ①.



Fig. 1 Interface box IFU 2.1 with USB connector.

The interface box IFU 2.1 has 4 channels for data recording and device control for devices that are not supported by KNAUER software. This includes data recording from detectors via analog inputs, flow rate control for HPLC pumps via analog outputs or switching of valves via digital outputs. The only requirement is that the device supports these tasks. Further information comes included with the manual of the device.

The interface box is no standalone device, which means that software control is strictly required (e. g. KNAUER ChromGate or KNAUER ClarityChrom).

Note: Which interface box functions are supported by the control software can be found in the software manual. The software manual also includes information on configuring and programming the interface box for the Smartline Manager 5000.

Scope of Delivery

Contents of the interface box accessories kit:

- 4 x remote connector, 9-pin
- 1 x depressor tool
- 1 x USB cable (mini B/standard A)
- 1 x cable with wired ends
- 3 x flat band cable, 10-pin

Overview and Connectors

Front View of the Device

Legend

- ① AN.IN (data signal input)
- ② AN.OUT (output of analog control signal)
- ③ DIG.IN (trigger input)
- ④ DIG.OUT and autozero
- ⑤ Channel 1

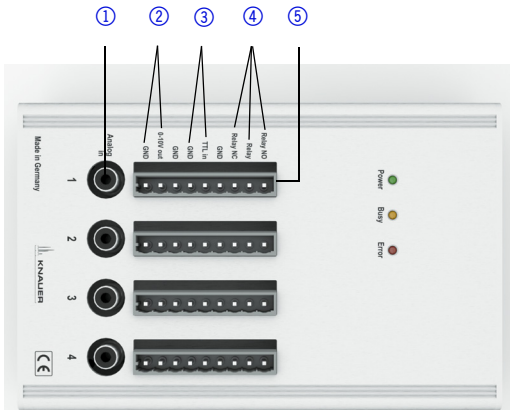


Fig. 2 Front view of interface box IFU 2.1



Caution! No electrical isolation provided.
Voltages above 10 V can damage connected computers.

LED

LEDs indicate the device's condition. The green LED „Power“ shows that the device has successfully been connected to a computer. The yellow LED „Busy“ shortly lights up during calibration or after receiving a signal from the control software. Calibration is done when starting a device or a run. „Busy“ permanently lights up if the control software checks on the device's status regularly, e. g. every second.

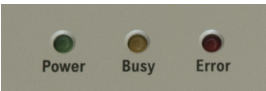


Fig. 3 LED

The red LED „Error“ lights up if a calibration error is detected while running the self-test or if the software sends a signal that is not recognized by the device.

Analog Inputs (AN.IN)

Serving the purpose of receiving analog signals, up to 4 channels or devices can be connected to the interface box. Channels are independent of each other and can be used simultaneously by one system or various systems.

Voltage range-	2.56 to +2.56 V (bipolar mode)
Absolute maximum ratings	10 V to +10 V
Input impedance	10 MΩ
Maximum resolution	24 bit
Minimum noise level	7 μV (1 Hz, time constant 0.1 s)
Maximum data rate	up to 10 Hz (each channel)
Gain factor (for all channels)	1, 2, 4, 8, 16

Analog Outputs (AN.OUT)

These outputs send analog voltage signals to control devices, which have the necessary inputs. According to the number of outputs, four of these devices can be controlled with one interface box. The outputs can be programmed independently of each other. This e. g. refers to the control of pumps in a high pressure gradient system.

Voltage range	0 V to +10 V
Minimum voltage step (DAC resolution)	2.5 mV (12 bit)
Maximum load resistance	2 kΩ

Digital Inputs (DIG.IN)

These four inputs are trigger inputs receiving a start signal from the injection system. They work with contact end on ground and are compatible for TTL/

CMOS or open collectors. If the channels are used for different systems, it is possible to start each channel individually.

Max. high level input voltage	+15 V
Min. high level input voltage	+2.5 V
Max. low level input voltage	+1 V
Min. low level input voltage	-15 V
Maximum input, current at V (in) = 0,5 V	10 mA

Digital Outputs (DIG.OUT)

These four outputs are electromechanical relays with single pole switch (SPDT) meaning they are to be used as NO (normally open, connectors 2 – 3, see front view) or as NC (normally closed, connectors 1 – 2, see front view). You can program sampled signals or steady rate signals. A sampled signal has a duration of appr. 1 s, the length of the steady rate signal is not predetermined.

Output type	either NO or NC
Max. switching voltage	max. 175 V, DC
Max. switching current	max. 0.25 A

Installation

Power Supply

The interface box is connected to a computer with an USB cable and receives electricity from it. The USB cable is part of the accessories kit of the interface box.



Caution! No electrical isolation provided.
Voltages above 10 V can damage connected computers.

Connecting the Interface Box to a Computer

To establish a connection between the interface box and the computer, you take the USB cable from the accessories kit and plug it into both devices. It is possible that your computer does not feature the correct drivers. In this case, go to the website of the product and download the correct drivers.

The computer identifies the interface box as a serial device even though it was connected using the USB interface. Now check for the COM ports in the Windows device manager.

Including the interface box in KNAUER chromatography software

Note: **Read this segment carefully if the serial number of your interface box is > 65000 and if you use OpenLAB®, ChromGate® or EuroChrom® 2000 for Windows.**

OpenLAB® and ChromGate®: Upon registration you are asked to enter the serial number of the interface box of which you need to enter the last four digits only.

EuroChrom®: When the software requests the serial number of the interface box in the hardware module, only the last four digits can be seen.

Analog Inputs

If you are to connect the analog output of a device (e. g. 1 V integrator output of a detector) with the analog input of the interface box, use a RCA cable supplied or recommended by the manufacturer. Alternatively use a matching cable included with the interface box accessory kit. Please pay attention to the allowed maximum voltage. Otherwise the device can get damaged.

Note: **The analog output and digital input of the same channel cannot be used at the same time.**

Analog Outputs

The analog outputs have to match the control input of the connected device. Information on the control inputs come included with the user manual of the device. Please pay attention to the allowed maximum voltage. Otherwise the device can get damaged. KNAUER can not be held reliable in this case. The required components of the remote connector and the USB cable are part of the accessories kit of the interface box.

Note: **The analog input and digital output of the same channel cannot be used at the same time.**

Digital Connections

Digital inputs can be used to forward trigger signals coming from the injection unit. The connector for the trigger signal is the digital input of the channel, which also servers for recording data from the detector.

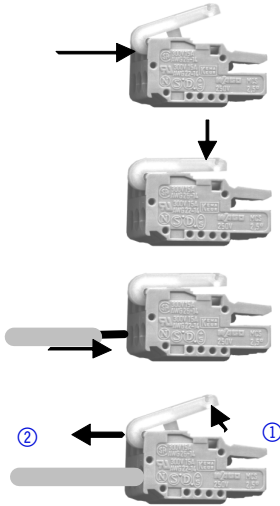
Digital outputs can be programmed via control software.

The required components of the remote connector and the USB cable are part of the accessories kit of the interface box. If you require a NO connect the contacts 2 and 3 (see rear view) or if you require NC connect the contacts 1 and 2 (see rear view).

Note: If the analog input of a channel is used, it is not possible to program the digital output of the same channel. In this case, the digital output D.OUT sends a sampled signal at the start of run that e. g. can be used as autozero signal for a detector.

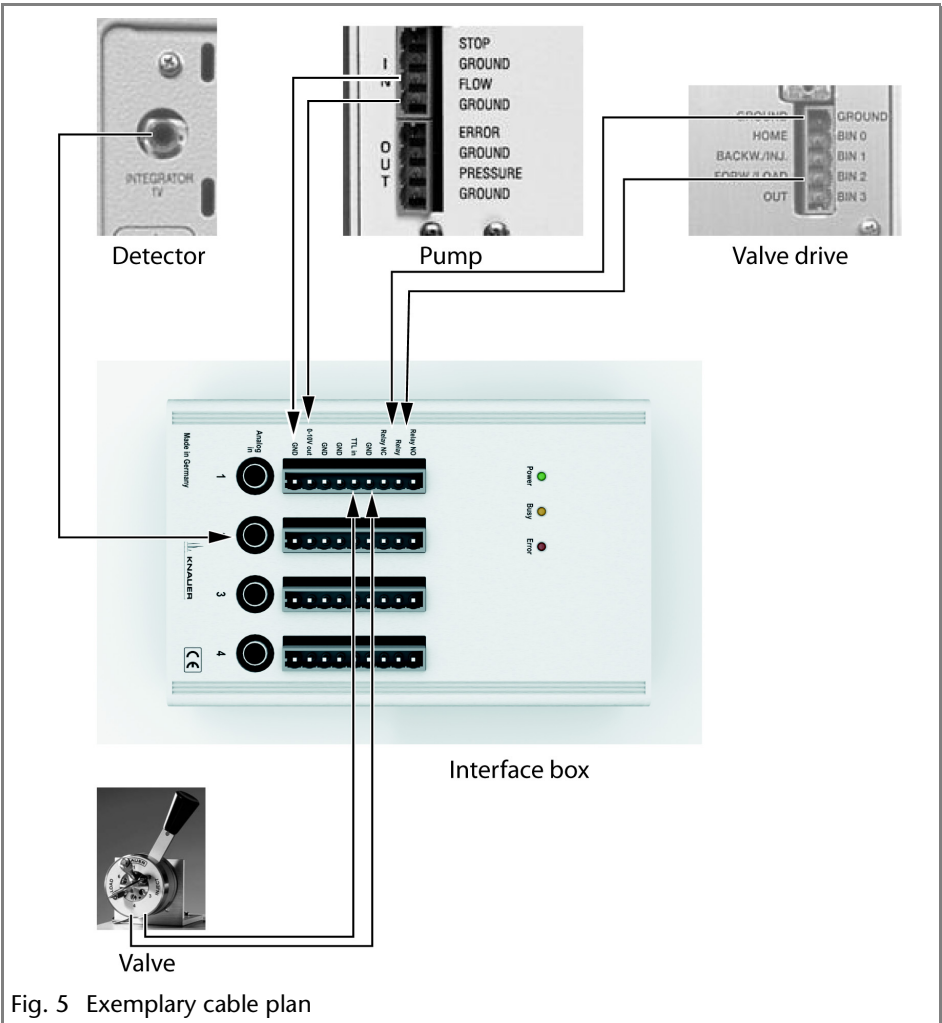
Mounting the Remote Connector

Please follow the instructions below if you are to connect cables to the remote connector.

Process	Figure
1. Guide the blunt side of the depressor tool into the square opening of the desired connector. 2. Press down the lever as indicated by the arrow. 3. Guide the non-insulated end of the cable into the opening below the lever. 4. At first let go of the lever ① and secondly remove the depressor tool from the plug ②. The cable is now well-connected to the remote connector.	 Fig. 4 Remote connector

Cable Plan

The exemplary cable plan shows a possible connection scheme for the connectors. Pay attention to the fact that the digital output and analog input of a channel can not be used at the same time, except the analog input is used for autozero of a detector.



Technical Data

Power connection	via USB 2.0, 5 V max; 500 mA
Dimensions	105 x 26 x 161.5 mm (W x H x D)
Weight	0.35 kg

Legal Information

Warranty Conditions

The factory warranty for the device is valid for 12 months after the date of dispatch. All warranty claims shall expire in the event that any unauthorized changes are made to the device.

During the warranty period, any components with material or design-related defects will be replaced or repaired by the manufacturer free of charge.

This warranty excludes the following:

- accidental or willful damage
- damage or errors caused by third parties that are not contractually related to the manufacturer at the time the damage occurs
- wear parts, fuses, glass parts, columns, light sources, cuvettes and other optical components
- damage caused by negligence or improper operation of the device and damage caused by clogged capillary
- packaging and transport damage

In the event of device malfunctions, directly contact the manufacturer.

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Transport Damage

The packaging of our devices provides the best possible protection against transport damage. Check the devices for signs of transport damage. In case you notice any damage, contact the Technical Support and the forwarder company within three workdays.

Declaration of Conformity

Manufacturer name and address

KNAUER Wissenschaftliche Geräte GmbH
Hegauer Weg 38
14163 Berlin, Germany

Interface Box IFU 2.1

Product number(s): EZB00

complies with the following requirements and product specifications:

- DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)
- DIN EN 60799 (June 1999) Electrical accessories - Cord sets and inter-connection cord sets
- IEC 61010-1 (2010 + Corrigendum: 2011) Safety requirements for electrical equipment for measurement, control and laboratory use
 - Low voltage directive (2006/95/EC)
- EN 61000-3-2 (2005 + A1:2008 + A2:2009) Electromagnetic compatibility (EMC) Part 3-2
 - EMC standard (2004/108/EC)
- IEC 61326-1 (2006) Electrical equipment for measurement, control and laboratory use – EMC requirements
 - EN 61326-1 Corrigendum 2 (2011)
- Directives for an environmentally sound use of electrical and electronic equipment
 - RoHS directives 2002/95/EC (2003) and 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment
 - WEEE directive 2002/96/EC (2003) and 2012/19/EU on waste electrical and electronic equipment

The device was tested with a typical configuration. The mark of conformity has been applied to the rear panel of the device.



Berlin, 2014-10-01

Alexandra Knauer (CEO)



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