

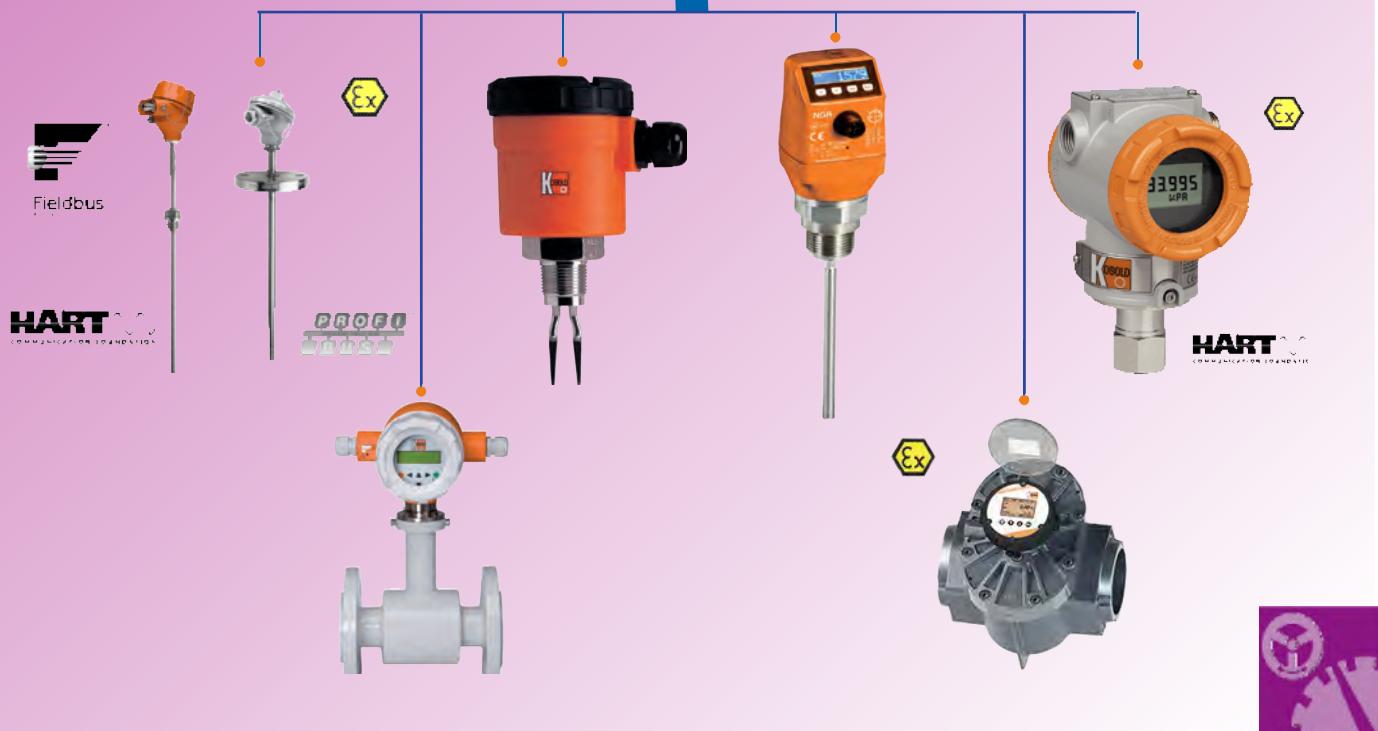


# Electronic Multi-Channel Datalogger



measuring  
•  
monitoring  
•  
analysing

## KBL Quick Guide



KOBOLD companies worldwide:

ARGENTINA, AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHILE, CHINA, COLOMBIA, CZECHIA, EGYPT, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, REPUBLIC OF KOREA, ROMANIA, SINGAPORE, SPAIN, SWITZERLAND, TAIWAN, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

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Explanation of symbols used in the manual:



- This symbol denotes especially important guidelines concerning the installation and operation of the device. Not complying with the guidelines denoted by this symbol may cause an accident, damage or equipment destruction.

**IF THE DEVICE IS NOT USED ACCORDING TO THE MANUAL  
THE USER IS RESPONSIBLE FOR POSSIBLE DAMAGES.**



- This symbol denotes especially important characteristics of the unit. Read any information regarding this symbol carefully.

## **1. EXPORT MANUAL**

In order to export the user manual into a flash disk, use “**Export manual**” button available in the „**Device information**” menu.



## **2. GENERAL CHARACTERISTICS**

The **KBL** is a sophisticated multichannel unit which allows simultaneous measurement, visualisation and control of numerous channels. This device can operate autonomously or with cooperation with external measurement devices and actuators.

### **2.1. THE USE OF TOUCH-SCREEN**

Do not use pointers with sharp edges (like tips of pencils and pens, knives, scissors, needles, wires, nails, bolts etc.) while working with touch-screen. It is strongly recommended to use a special stylus made of plastic or another soft material with round ends (for example the stylus delivered with the device). The display of the **KBL** should also be protected against aggressive substances and extremely high and low temperatures (see **Chapter 4. TECHNICAL DATA**).

### **3. BASIC REQUIREMENTS AND USER SAFETY**



- **The manufacturer is not responsible for any damages caused by inappropriate installation, not maintaining the proper environmental conditions and using the unit contrary to its assignment.**
- Installation should be conducted by qualified personnel. During installation all available safety requirements should be considered. The fitter is responsible for executing the installation according to this manual, local safety and EMC regulations.
- GND input of device should be connected to PE wire;
- The unit must be properly set-up, according to the application. Incorrect configuration can cause defective operation, which can lead to unit damage or an accident.
- **If in the case of a unit malfunction there is a risk of a serious threat to the safety of people or property additional, independent systems and solutions to prevent such a threat must be used.**
- **The unit uses dangerous voltage that can cause a lethal accident. The unit must be switched off and disconnected from the power supply prior to starting installation of troubleshooting (in the case of malfunction).**
- Neighbouring and connected equipment must meet the appropriate of appropriate standards and regulations concerning safety and be equipped with adequate overvoltage and interference filters.
- **Do not attempt to disassemble, repair or modify the unit yourself. The unit has no user serviceable parts. Defective units must be disconnected and submitted for repairs at an authorized service centre.**



- In order to minimize fire or electric shock hazard, the unit must be protected against atmospheric precipitation and excessive humidity.
- Do not use the unit in areas threatened with excessive shocks, vibrations, dust, humidity, corrosive gasses and oils.
- Do not use the unit in areas where there is risk of explosions.
- Do not use the unit in areas with significant temperature variations, exposure to condensation or ice.
- Do not use the unit in areas exposed to direct sunlight.
- Make sure that the ambient temperature (e.g. inside the control box) does not exceed the recommended values. In such cases forced cooling of the unit must be considered (e.g. by using a ventilator).



**The unit is designed for operation in an industrial environment and must not be used in a household environment or similar.**

## 4. TECHNICAL DATA

Power supply voltage (depending on version)	85... <b>230</b> ...260V AC/DC; 50 ÷ 60 Hz or 19... <b>24</b> ...50V DC; 16V... <b>24</b> ...35V AC
External Fuse (required)	T - type, max. 2 A
Power consumption	typically 15 VA; max. 20 VA
Display (depending on version)	TFT colour graphic display, 3.5" or 5.7", 320 x 240 pixels, with LED backlight
Sensor power supply output	24V DC ± 5% / max. 200 mA
Basic communication interfaces	RS 485, 8N1/2, Modbus RTU, 1200 bit/s ÷ 115200 bit/s USB Host port, USB Device port
Digital input	1 input 0/15..24V DC, galvanic insulation (low state: 0÷5V, high state: 8÷24V); power consumption: 7,5 mA / 24V insulation: 1 min @ 500V DC
Optional communication module*	second USB Host port serial RS-485 and RS-485/RS-232 Ethernet 10M RJ-45
Optional input modules*	4/8/16 x voltage (0÷10V) / current (0÷20 mA)** 4 x RTD (Pt100, Pt500, Pt1000, Cu50, Cu100)** 4/8 x TC (J, K, S, T, N, R, B, E, L(GOST)** 8/16 x digital input** 3 x universal input** 4 x universal counter** 4 x flowmeter + 4 x current**
Optional output modules*	4 x relay 5A/250V (cos φ = 1)** 8 x relay 1A/250V (cos φ = 1)** 8/16 x SSR driver (10÷15V, up to 100 mA per output)** 2/4 x IO passive current output (4÷20 mA)**
Protection level (depending on version)	IP 65 (from front, after using waterproof frame, only with USB interface on rear panel) IP 54 (from front, with transparent door) IP 40 (from front, standard) IP 20 (housing and connection clips)
Housing	panel, material: NORYL - GFN2S E1
Housing dimensions	96 x 96 x 100 mm (small case) or 144 x 144 x 100 mm (big case)
Mounting hole	90.5 x 90.5 mm (small case) or 137 x 137 mm (big case)
Assembly depth	102 mm
Panel thickness	max. 5 mm
Operating temperature	0°C to +50°C
Storage temperature	-10°C to +70°C
Humidity	5 to 90% no condensation
Screws tightening max. torque	0,5 Nm
Max. connection leads diameter	2,5 mm <sup>2</sup>
Safety requirements according to: PN-EN 61010-1	installation category: II pollution degree: 2 voltage in relation to ground: 300V AC insulation resistance: >20 MΩ insulation strength between power supply and input/output terminal: 1min. @ 2300V
EMC	PN-EN 61326-1

\* check the current list of measurement modules at your local MultiCon supplier.

\*\* see the full specification in the appendix

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## **5. DEVICE INSTALLATION**

The unit has been designed and manufactured in a way assuring a high level of user safety and resistance to interference occurring in a typical industrial environment. In order to take full advantage of these characteristics installation of the unit must be conducted correctly and according to the local regulations.



- Read the basic safety requirements on page 3 prior to starting the installation.
- Ensure that the power supply network voltage corresponds to the nominal voltage stated on the unit's identification label.
- The load must correspond to the requirements listed in the technical data.
- All installation works must be conducted with a disconnected power supply.
- Protecting the power supply connections against unauthorized persons must be taken into consideration.



**This is a class A unit. In a residential or a similar area it can cause radio frequency interference. In such cases the user can be requested to use appropriate preventive measures.**

### **5.1. UNPACKING**

After removing the unit from the protective packaging, check for transportation damage. Any transportation damage must be immediately reported to the carrier. Also, write down the unit serial number located on the housing and report the damage to the manufacturer.

### **5.2. ASSEMBLY**



- The unit is designed for mounting inside housings (control panel, switchboard) insuring appropriate protection against surges and interference. Metal housings must be connected to ground in a way that complies with the governing regulations.
- Disconnect the power supply prior to starting assembly.
- Check the connections are wired correctly prior to switching the unit on.

In order to install the unit, a mounting hole must be prepared according to Fig. 5.1. The thickness of the material of which the panel is made must not exceed 5 mm. When preparing the mounting hole take the grooves for catches located on both sides of the housing into consideration (Fig. 5.1). Place the unit in the mounting hole inserting it from the front side of the panel, and then fix it using the brackets (Fig. 5.3). The minimum distances between the center points of multiple units - due to the thermal and mechanical conditions of operation - are shown on Fig. 5.2.

**KBL 96 x 96mm:**  
 H, W = 90.5 mm  
 h = 16 mm

**KBL 144 x 144mm:**  
 H, W = 137 mm  
 h = 38.5 mm

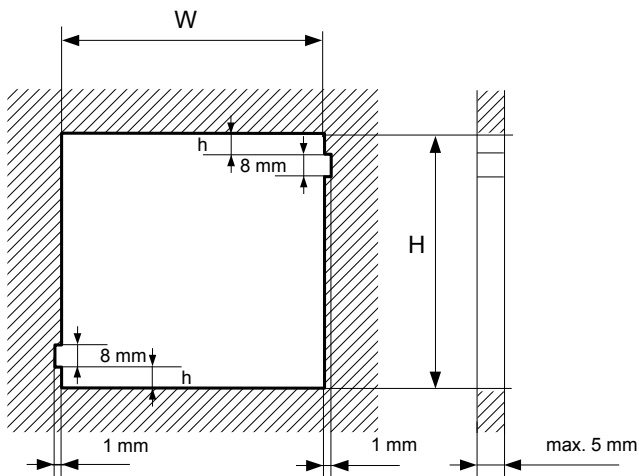


Fig. 5.1. Mounting hole dimensions KBL

**KBL 96 x 96 mm:**  
 H, W = 115 mm

**KBL 144 x 144mm:**  
 H, W = 165 mm

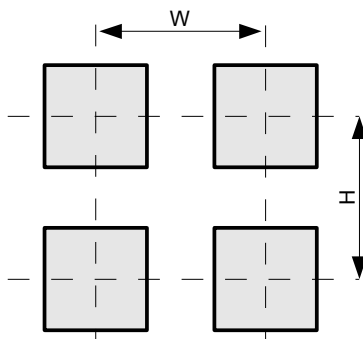


Fig. 5.2. Minimum distances when assembly of a number of units

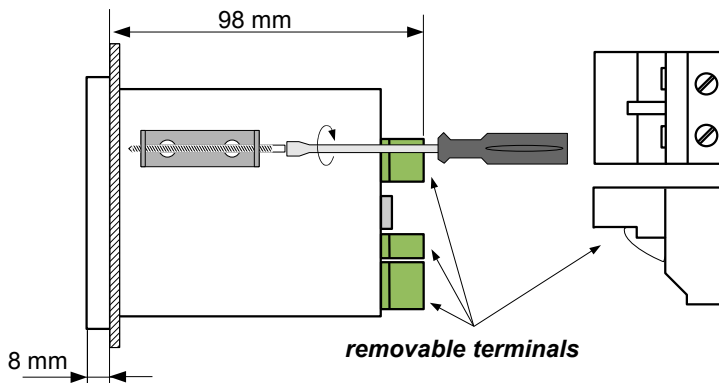


Fig. 5.3. Installing of brackets

### 5.3. CONNECTION METHOD

#### Caution



- Installation should be conducted by qualified personnel. During installation all available safety requirements should be considered. The fitter is responsible for executing the installation according to this manual, local safety and EMC regulations.
- The unit is not equipped with an internal fuse or power supply circuit breaker. Because of this an external time-delay cut-out fuse with a small nominal current value must be used (recommended bipolar, max. 2A) and a power supply circuit-breaker located near the unit. In the case of using a monopolar fuse it must be mounted on the active wire (L).
- The power supply network cable diameter must be selected in such a way that in the case of a short circuit of the cable from the side of the unit the cable shall be protected against destruction with an electrical installation fuse.
- Wiring must meet appropriate standards and local regulations and laws.
- In order to secure against accidental short circuit the connection cables must be terminated with appropriate insulated cable tips.
- Tighten the clamping screws. The recommended tightening torque is 0.5 Nm. Loose screws can cause fire or defective operation. Over tightening can lead to damaging the connections inside the units and breaking the thread.
- In the case of the unit being fitted with separable clamps they should be inserted into appropriate connectors in the unit, even if they are not used for any connections.
- **Unused terminals (marked as n.c.) must not be used for connecting any connecting cables (e.g. as bridges), because this can cause damage to the equipment or electric shock.**
- If the unit is equipped with housing, covers and sealing to protecting against water intrusion, pay special attention to their correct tightening or clamping. In the case of any doubt consider using additional preventive measures (covers, roofing, seals, etc.). Carelessly executed assembly can increase the risk of electric shock.
- After the installation is completed do not touch the unit's connections when it is switched on, because it carries the risk of electrical shock.

Due to possible significant interference in industrial installations appropriate measures assuring correct operation of the unit must be applied. To avoid the unit of improper indications keep recommendations listed below.

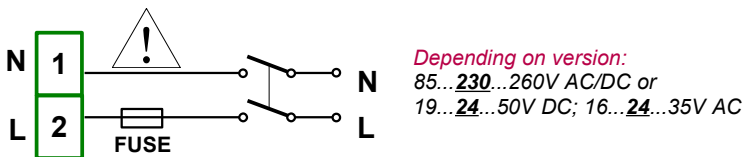


Fig. 5.4. Connection of power supply

- Avoid running signal cables and transmission cables together with power supply cables and cables controlling inductive loads (e.g. contactors). Such cables should cross at a right angle.
- Contactor coils and inductive loads should be equipped with interference protection systems, e.g. RC-type.
- Use of screened signal cables is recommended. Signal cable screens should be connected to the earthing only at one of the ends of the screened cable.



- In the case of magnetically induced interference the use of twisted pair signal cables is recommended. Twisted pair (best if shielded) must be used with RS-485 serial transmission connections.
- In the case of measurement or control signals are longer than 30 m or go outside of the building then additional safety circuits are required.
- In the case of interference from the power supply side the use of appropriate interference filters is recommended. Bear in mind that the connection between the filter and the unit should be as short as possible and the metal housing of the filter must be connected to the earth with the largest possible surface. The cables connected to the filter output must not be run with cables with interference (e.g. circuits controlling relays or contactors).

Connections of power supply voltage and measurement signals are executed using the screw connections on the back of the unit's housing.

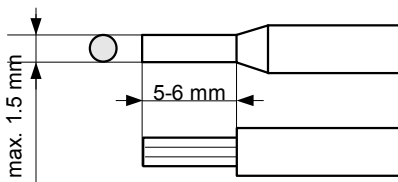


Fig. 5.5. Method of cable insulation replacing and cable terminals dimensions



**All connections must be made while power supply is disconnected !**

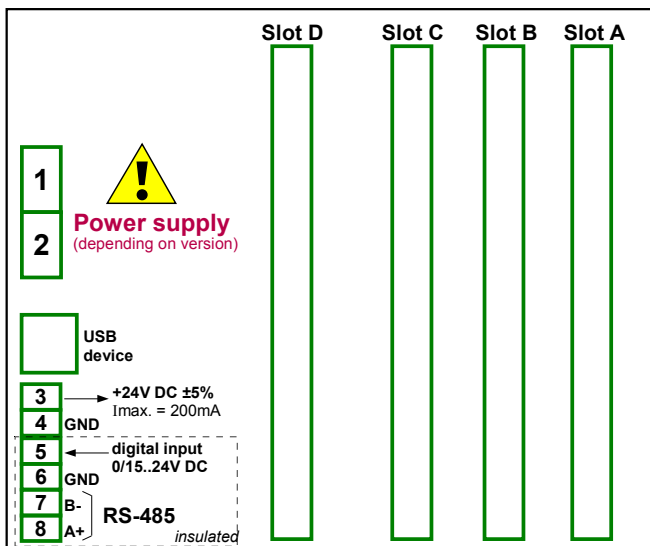


Fig. 5.6. Terminals description

The basic performance of the device (see Fig. 5.6) contains only the extreme left terminals: Power supply, USB device port, Sensor supply output +24V DC  $I_{max}=200$  mA, Digital input 0V...15...24V DC (low state: 0÷5V, high state: 8÷24V), Interface RS-485.

Depending on customer's needs, the basic version of the device can be upgraded with up to three I / O modules (installed in a place marked as **Slot A**, **Slot B**, **Slot C**) and ACM - advanced communication module (additional serial, USB and Ethernet interfaces, installed in **Slot D**).