

myPCLab

Data Logger
User Manual



ABUS TECHNOLOGIES INC.

WARNING

- ❖ This manual should be passed on to the end user.
- ❖ The contents of this manual are subject to change without prior notice.
- ❖ All rights reserved.
- ❖ ABUS gives no warranty of any kind with regard to this manual, including, but not limited to, fitness for a particular purpose.
- ❖ If any question arises or errors are found, or if any information is missing from this manual, please inform your supplier or inform at info@abustek.com.
- ❖ The specifications mentioned in this manual are limited to those for the standard type under the specified model number break-down and do not necessarily apply for customized instruments.
- ❖ Please note that changes in the specifications, construction, or component parts of the instrument may not immediately be reflected in this manual at the time of change.
- ❖ If the customer or any third party is harmed by the use of this product, ABUS assumes no responsibility for any such harm owing to any defects in the product which were not predictable, or for any indirect damages.

Although Warning hazards are related to personal injury, and Caution hazards are associated with equipment or property damage, it must be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process system performance leading to personal injury or death. Therefore, comply fully with all Warning and Caution notices.

Information in this manual is intended only to assist our customers in the efficient operation of our equipment. Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval of Technical Communications Department, ABUS Technologies

HEALTH AND SAFETY

To ensure that our products are safe and without risk to health, the following points must be noted:

1. The relevant sections of these instructions must be read carefully before proceeding.
2. Warning labels on containers and packages must be observed.
3. Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given. Any deviation from these instructions will transfer the complete liability to the user.
4. Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
5. Chemicals must be stored away from heat, protected from temperature extremes and powders kept dry. Normal safe handling procedures must be used.
6. When disposing of chemicals ensure that no two chemicals are mixed.

Safety advice concerning the use of the equipment described in this manual or any relevant hazard data sheets (where applicable) may be obtained from the Company address on the back cover, together with servicing and spares information.

CATALOGUE

Contents	Page No.
1. Introduction	4
2. Presentation	4
Technical Parameters	4
3. Dimensions	5
4. Connections	6
1. Pt-100 Wiring	6
2. Thermocouple Wiring	6
3. 4 ~ 20 mA Wiring	7
4. 0 ~ 50 mV Wiring	7
5. 0 ~ 10 V Wiring	7
6. Dry Contact Wiring	7
7. Voltage Digital Input Wiring	8
5. Installation	8
1. Recommendation	8
2. Input Signal	8
3. USB Driver Installation	9
4. Software Installation	10
6. Configuration	11
Serial Port Assignment	11
7. Safety Precautions	12
8. Warranty	12

1. INTRODUCTION

myPCLab is a very compact Data Acquisition tool that connects to a PC via a USB port and monitors two universal input analogue variables along with one digital input. From hobbyists to scientists, from simple technical tasks to complex engineering activities, **myPCLab** can be an invaluable tool for on-line monitoring and data logging in school, laboratory research, machine data recording and industrial understanding.

It comes with intuitive and easy-to-use Windows software which plots and records the data, shows gauges, bar-graphs and digital readouts. The USB port is accessed as a virtual serial port, which makes **myPCLab** compatible with SCADA software with Modbus RTU driver or with any program with ASCII serial communication.

Multiple units of **myPCLab** can be connected to the same computer, easily expanding the number of inputs. The **myPCLab** software can simultaneously communicate with multiple modules.

This manual describes software installation and connection of input signals to a **myPCLab** module. Instructions on using the software are available on its help system.

2. PRESENTATION

Technical Parameters

Analog Input Signals: Configurable for channels 1 and 2. The input signals and measuring ranges are listed in the above table.

Thermocouples: J, K, T, E, N, R, S and B types.

Input Impedance $\gg 1 \text{ M}\Omega$

Pt100: Three wires connection, 625 μA bias current, $\alpha = 0.00385$.

Linear Signals: 0 to 50 mVdc: Input Impedance $\gg 1 \text{ M}\Omega$

0 to 10 Vdc: Input Impedance = 1 $\text{M}\Omega$. Available only for channel 1.

4 to 20 mAcd: Input Impedance: 22 Ω (+ 2,0 Vdc)

Digital Input: Logic voltage or dry contact signals.

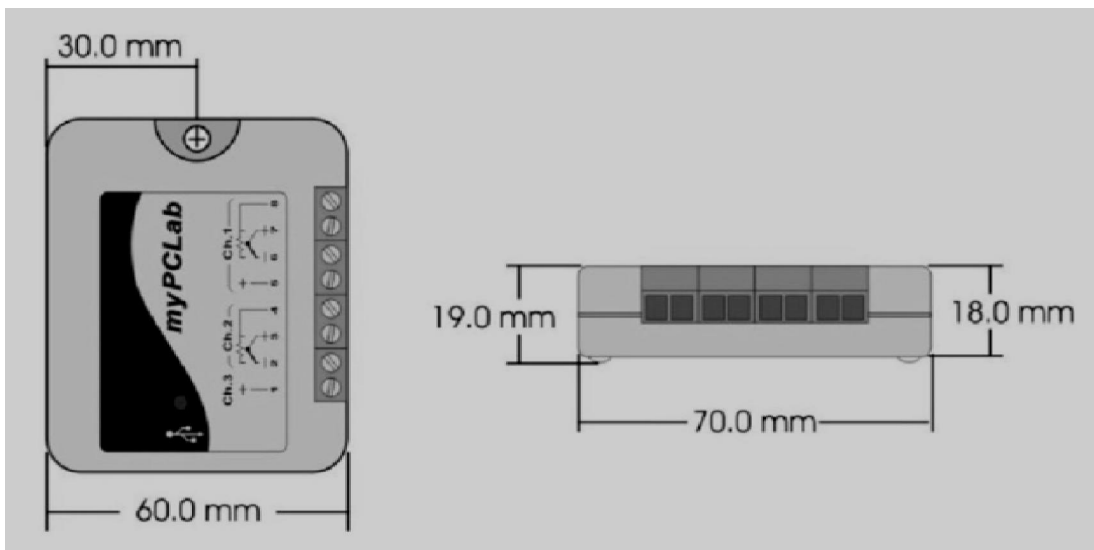
“0” Logic Level: contact closed or voltage lower than 0,5 Vdc.

“1” Logic Level: contact opened or voltage from 2,0 V to 5,0 Vdc.

Digital input special features: Digital input can be configured for counting, timing or frequency measuring (pulses per time unit). Configurable: debounce time and scale factor.

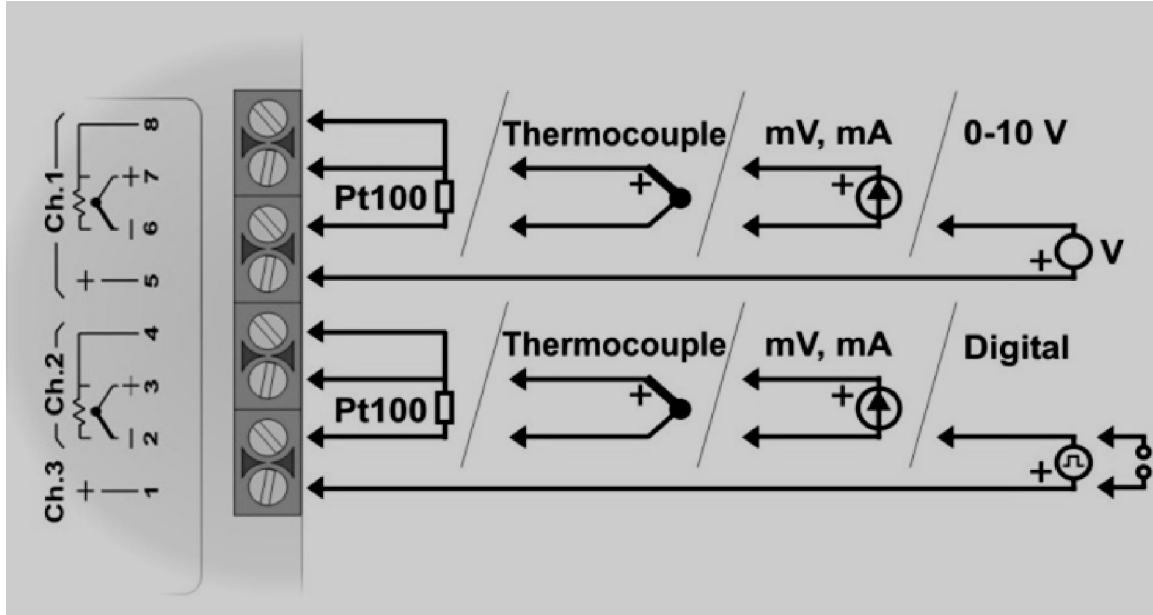
- Counting:** It counts from 0 up to 4294967295. It is selectable to count on input rising edge, falling edge or both. Maximum input frequency: 1 kHz (square wave, no debounce). Maximum input frequency: 1 kHz (square wave, no debounce).
- Timing:** It times up to 4294967295 milliseconds (more than 49 days). It is selectable to run timing when input in logic level "0" or when in "1". Accuracy: 0.5 % of the indicated time.
- Frequency:** It counts the number of pulses (rising edge, falling edge or both) in each base time, configurable from 1 to 65535 seconds (18 hours). Maximum input frequency: 500 Hz (square wave, no debounce). Maximum input frequency: 500 Hz (square wave, no debounce). Accuracy: 0.5 %.
- Ambient Temperature Sensor:** Internal thermistor.
- Total Accuracy:** Thermocouples R, S and B: 0.25% of the maximum range ± 3 °C (with maximum A/D resolution);
Other thermocouples: 0.25% of the maximum range ± 1 °C (with maximum A/D resolution);
Pt100, voltage and current: 0.20% of the maximum range (with maximum A/D resolution);
Ambient temperature channel: ± 1.5 °C (after 20 minutes connected to the USB port).
- A/D Resolution:** Configurable from 15 to 11 bits.
- Input Sampling Rate:** From 8 to 128 samples per second, depending on configured A/D resolution and number of enabled channels.
- Computer Interface:** USB V1. 1 Plug and Play, virtual serial port interface.
- USB connection:** Mini-B receptacle.
- Power supply:** From the USB bus. Typical current 30 mA.
- Operating environment:** 0 to 50°C, 10 to 90% relative humidity, non-condensing.
- Electromagnetic Compatibility:** EN 50081-2, EN 50082-2.
- Built-in cold junction compensation for thermocouples and wire resistance for Pt100.**
- ABS case, dimensions:** 70 x 60 x 18 mm.

3. DIMENSIONS



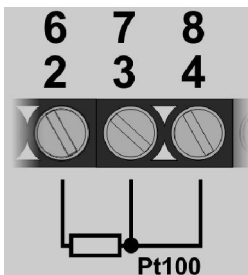
4. CONNECTIONS

This module operates only when connected to a PC USB bus, using the included type-A to mini-B cable. The following figure shows all possible input connections.



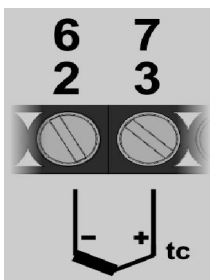
Warning: Signal wires connected to all inputs should be kept separated from power wires, and when possible installed inside of grounded electrical ducts.

3.1 Pt100 Wiring



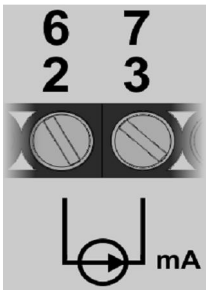
Connections of channel 1 are on terminals 6, 7 and 8. For channel 2 on terminals 2, 3 and 4. Connection with 3 wires from the sensor element to the module is necessary to cancel the cable resistance error in the measurement. The 3 wires must have the same length and gauge. To connect a Pt100 with 2 wires, connect terminals 7 and 8 (channel 1) or 3 and 4 (channel 2).

3.2 Thermocouple Wiring



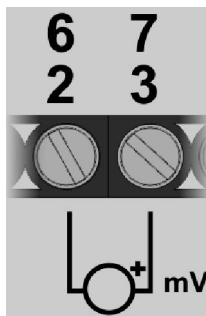
Connections of channel 1 are on terminals 6 and 7. For channel 2 on terminals 2 and 3. Observe indicated polarity. Cables for thermocouple connection must have the same thermo-electrical characteristics of the thermocouple element (compensation or extension cable). Observe that both the thermocouple and the compensation cable must be connected with correct polarity. If compensation cable is not used or is not connected with the correct polarity, large measurement errors will arise.

3.3 4-20 mA Wiring



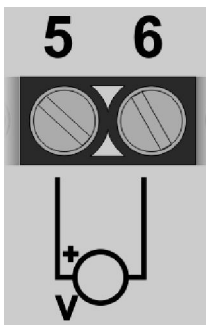
Connections of channel 1 are on terminals 6 and 7. For channel 2 on terminals 2 and 3. Observe indicated polarity.

3.4 0-50 mV Wiring



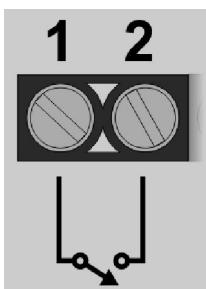
Connections of channel 1 are on terminals 6 and 7. For channel 2 on terminals 2 and 3. Observe indicated polarity.

3.5 0-10 V Wiring



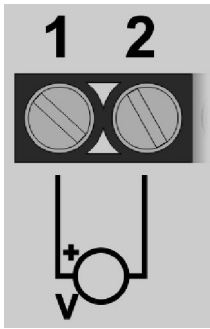
Linear voltage signals from 0 to 10 V can only be connected to channel 1, terminals 5 and 6. Observe indicated polarity.

3.6 Dry Contact Digital Input Wiring



Digital signals are connected to channel 3, terminals 1 and 2. The contact connected to digital input must not have any electrical voltage.

3.7 Voltage Digital Input Wiring



Digital signals are connected to channel 3, terminals 1 and 2. Observe indicated polarity. Voltage levels applied to this channel must be within the specified limits. See “Technical Parameters”.

5. INSTALLATION

5.1 Recommendation

myPCLab inputs are not electrically isolated from the USB port. Before connecting signals from sensors or transducers, make sure that they are not in contact with any source of electrical power (wires or conductive surfaces which may get energized). Input channels are not isolated from each other.

5.2 Input Signal

INPUT TYPE	MAXIMUM RANGE
J Thermocouple	-130,0 to 940,0 °C (-202,0 to 1724,0 °F)
K Thermocouple	-200,0 to 1370,0 °C (-328,0 to 2498,0 °F)
T Thermocouple	-200,0 to 400,0 °C (-328,0 to 752,0 °F)
E Thermocouple	-100,0 to 720,0 °C (-148,0 to 1328,0 °F)
N Thermocouple	-200,0 to 1300,0 °C (-328,0 to 2372,0 °F)
R Thermocouple	0,0 to 1760,0 °C (-32,0 to 3200,0 °F)
S Thermocouple	0,0 to 1760,0 °C (-32,0 to 3200,0 °F)
B Thermocouple	500,0 to 1800,0 °C (932,0 to 3272,0 °F)
Pt100 RTD	-200,0 to 650,0 °C (-328,0 to 1202,0 °F)
0 to 50 mVdc	Adjustable from -32767 to +32767
0 to 10 Vdc (Channel 1)	Adjustable from -32767 to +32767
4 to 20 mAdc	Adjustable from -32767 to +32767

myPCLab module sensors and signals

5.3 USB Driver Installation

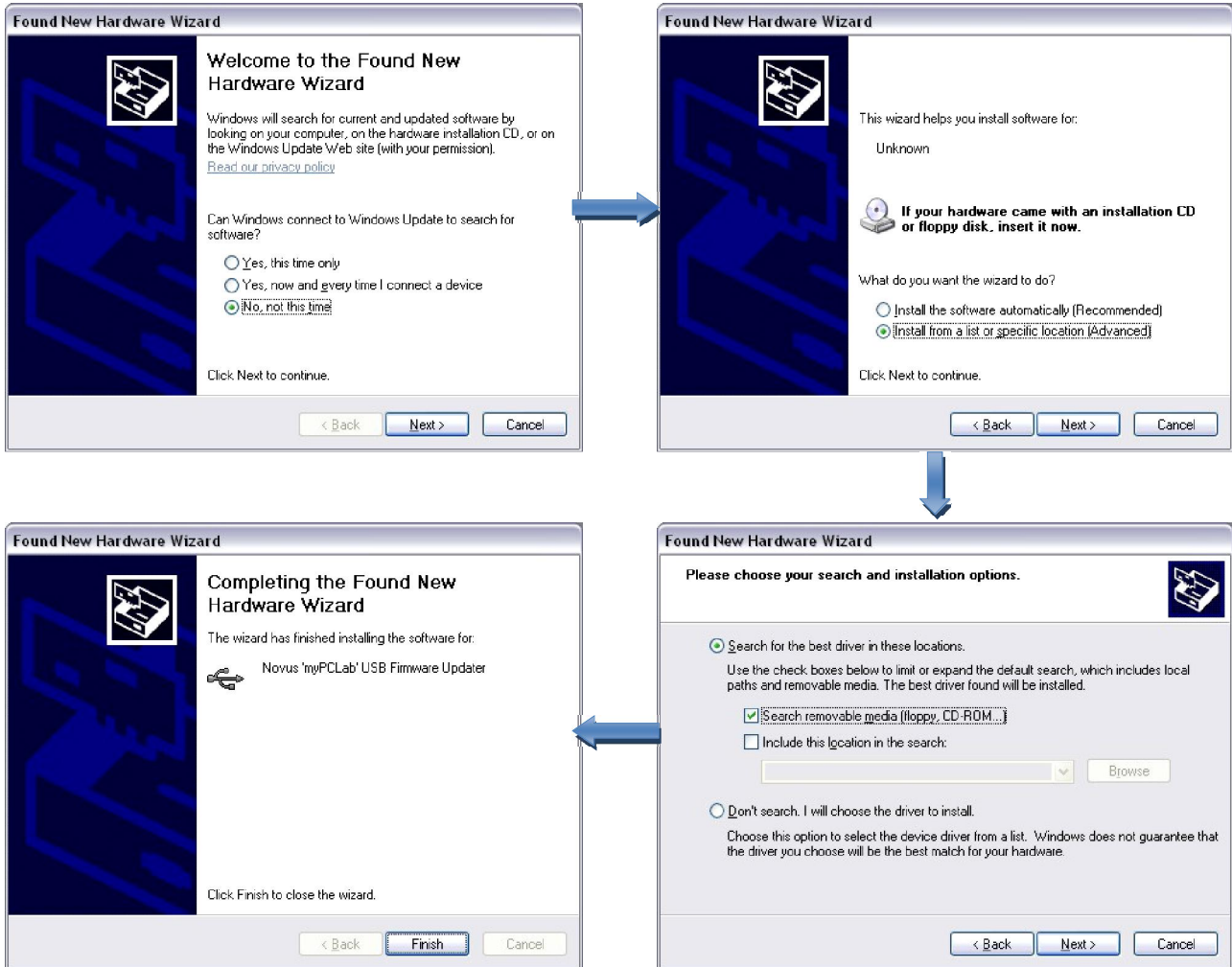
The following installation steps may be slightly different depending on your PC configuration and Windows version. Follow the Wizard instructions and use the following steps and figures to select the correct installation options.

1. Insert the **myPCLab** CD in the CD-ROM drive.
2. Connect the module to a PC USB port. Windows® will detect the new hardware and after a few seconds the new hardware wizard will start.
3. The Found New Hardware Wizard will show-up and ask if you want to connect to Windows Update to get the driver. Select the “No, not this time” and select “Next”.
4. Select “Install from a list or specific location (advanced)” and select “Next”.
5. Select “Search for the best driver in these locations” and check option “Search removable media”. Select “Next”. If the installation files are not in a CD, select option “Include this location in the search” and type the path for the required files.
6. If a warning message regarding Windows® XP compatibility appears, select “Continue Anyway”.
7. The **myPCLab** driver files will be copied to your computer and, when concluded, a window will show up informing that the wizard has finished installing the software. Select “Finish”.
8. It is possible that the previous steps repeat a second time for the completion of installation.

After driver installation, proceed to the next chapter to install the **myPCLab** software that provides configuration, visualization, recording and data export.

In future connection of **myPCLab** modules, it is possible that Windows® prompt again for the USB driver installation. In this case, the same wizard will be presented. Follow the above steps, but select option “Install the software automatically (recommended)”, since the driver files are already installed.

The following figures are examples of Windows XP® New Hardware Wizard. For Windows 2000® they look different, but the information is the same.



5.4 Software Installation

The **myPCLab** software is a Windows program intended to:

- Configuration of **myPCLab** modules.
- Plot and record data, show gauges, bar-graphs and digital readouts with data from multiple modules.
- Export acquired data in multiple file formats (xls, pdf, rtf, xml, html, dbf, txt, csv).

To install, execute file **myPCLabSetup.exe** from the installation CD, and follow the instructions to proceed with installation.

The **myPCLab** software has a complete help system, with all the necessary information for its use. Start the software and press F1 or select the Help menu to show the help content.



The **myPCLab** software can simultaneously communicate with multiple modules, making easy to expand the number of inputs of a measurement system.

6. CONFIGURATION

Serial Port (COM Port) Assignment

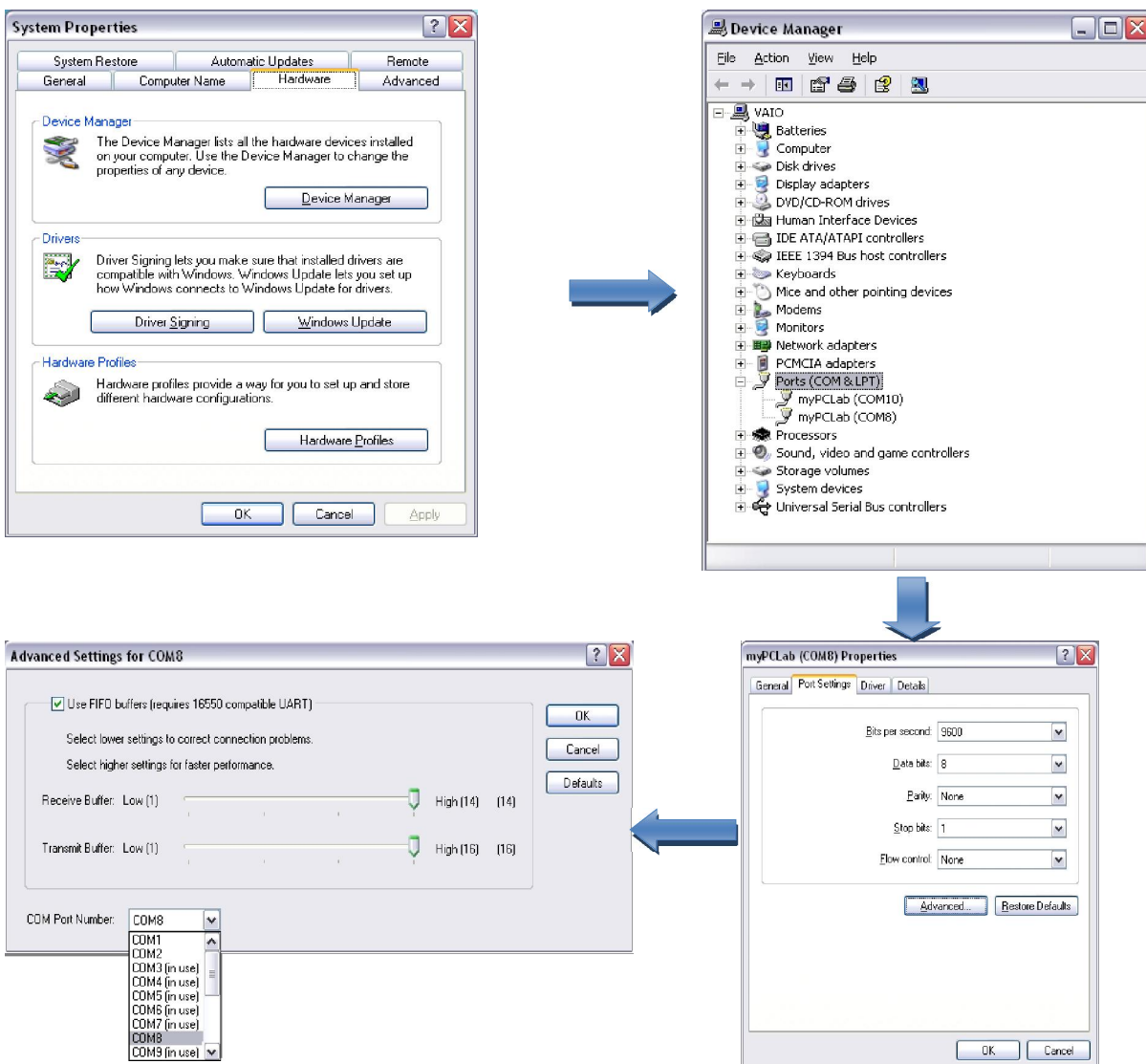
A few seconds after connection of a **myPCLab**, Windows operating system assigns a COM port number for communication. The assigned COM port number will not change in future connections to the same USB port. Users can easily identify and modify the assigned COM port in:

Control Panel / System / Hardware / Device Manager / Ports (COM & LPT)

Select the desired “myPCLab” device, click with the right mouse button and select “Properties”. Select “Port Settings” and click on the “Advanced...” button. In “COM Port Number” list, select the serial port to be assigned. Some serial port can be marked as “in use”. Only select one of these ports if you are sure it is not being used by any other peripheral in your computer.

In some cases, serial port can be marked as “in use” even when the associated device is not in the computer. In this case, it is safe to assign this port to **myPCLab**.

The following figures illustrate the most important steps for this procedure.



7. SAFETY PRECAUTIONS

1. The unit should be powered for 15 minutes before use.
2. Use in ambient temperature of 0-60°C.
3. Avoid vibrations, shock, excessive dust, corrosive chemical materials or gaseous environment.
4. Input wire should not be too long. If measured signal have to be far away from the unit, please use 2-core shielded cable.
5. Use this instrument in the scope of its specifications, otherwise fire or malfunctions may result.
6. Contact of the instrument, with organic solvents or oils should be avoided.
7. Do not turn on the power supply until all of the wiring is completed. Otherwise electrical shock, fire or malfunction may result.
8. Do not disassemble, repair or modify the instrument.
9. All connections should be tightened properly.
10. Power supply should be constant, should not be fluctuating.

8. WARRANTY

ABUS provides the original purchaser of this instrument a one (1) year warranty against defects in material and workmanship under the following terms:

- The one year warranty begins on the day of shipment as stated on the sales bill.
- During the warranty period all costs of material and labor will be free of charge provided that the instrument does not show any evidence of misuse.
- For maintenance, return the instrument with a copy of the sales bill to our factory.
- All transportation and insurance costs should be covered by the owner of the equipment.
- Should any sign of electrical or mechanical shock, abuse, bad handling or misuse be evident the warranty voids and maintenance costs will be charged.

ABUS TECHNOLOGIES INC.

www.abustek.com, E-Mail: info@abustek.com