LPMS-U2 Series
Quick Start Guide ver. 1.5

LPMS-CU2

LPMS-URS2

LPMS-UTTL2

LP-RESEARCH Inc.
http://www.lp-research.com

Revision History

Date	Revision	Changes
2016-07-11	1.0	- Initial release.
2016-08-31	1.1	- Add the tables of relations between baudrate and data update rate.
2016-10-13	1.2	- Correction on input voltage range
2018-03-27	1.3	- Updated tables of parameters
2018-06-21	1.4	- Updated maximum supply voltage
2020-03-10	1.5	- Combine LPMS-CU2, LPMS-URS2 and LPMS-UTTL2 quick start guides into this file - Remove the hardware information into another hardware manual

Table of Contents

I. Introduction

Welcome to the LP-RESEARCH Motion Sensor LPMS-U2 Series quick start guide.

In this documentation we will explain everything you need to know to quickly set up the LPMS-U2 series sensors (including LPMS-CU2, LPMS-URS2 and LPMS-UTTL2), install the software and get started with sensor data acquisition. If you have any further questions or comments regarding this documentation, please feel free to contact us anytime.

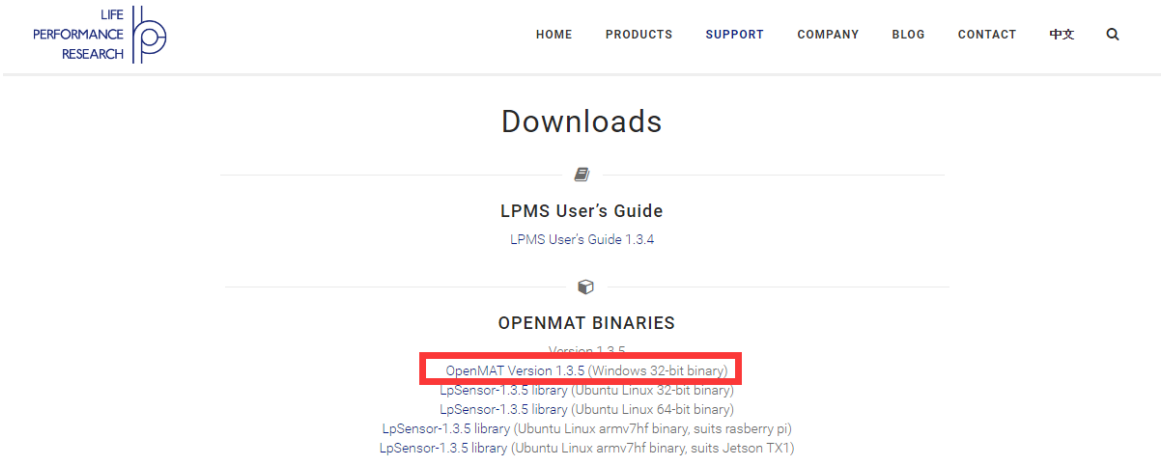
For more information on the LPMS-U2 or other product series, please refer to related user manuals, available from the LP-RESEARCH website at the following address: http://www.lp-research.com.

II.Operation

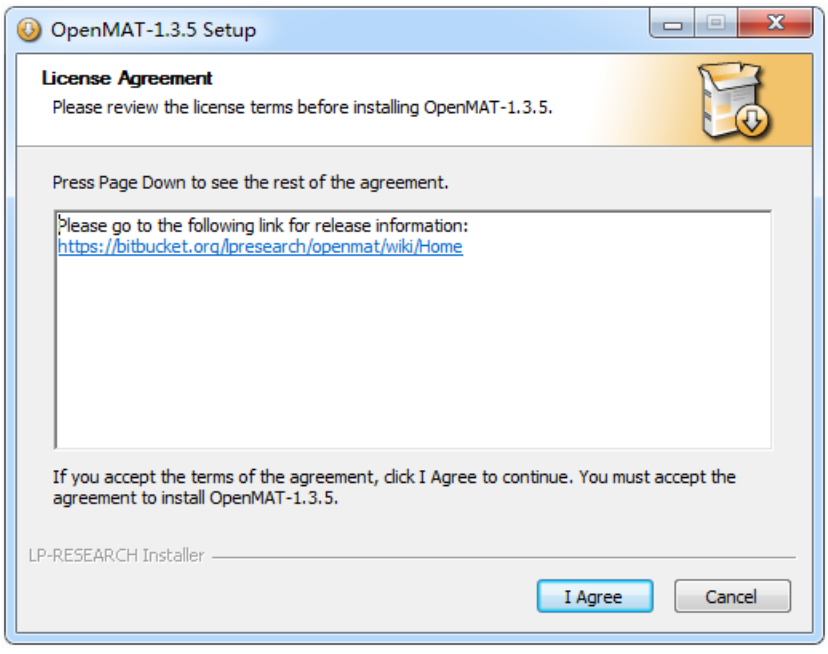
1. OpenMAT Software Installation

We offer windows OS based software called LpmsControl for users to easily manipulate the LPMS-CU2 sensor. The LpmsControl software is a sub program of OpenMAT software. Please choose a correct version of OpenMAT software from our homepage based on the operation system specification. The followings show an example of installing the OpenMAT software under Windows 7 32bit system.

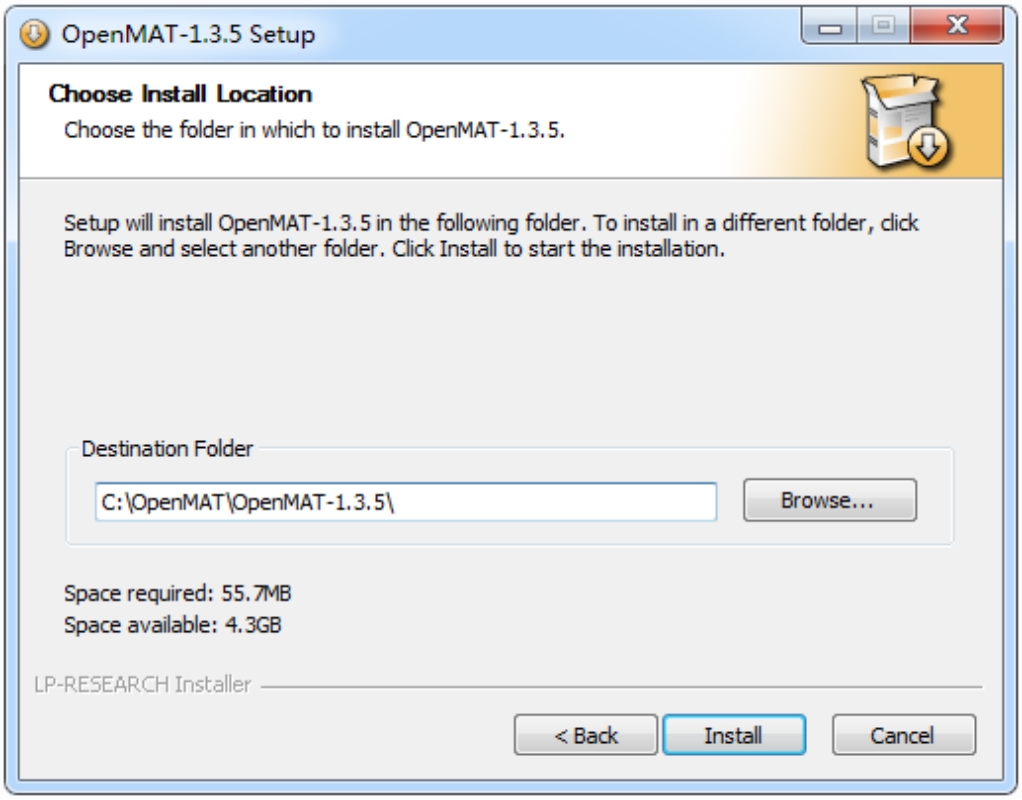
1) Go to: http://www.lp-research.com/support/, and download the latest version of OpenMAT for the sensor, like OpenMAT Version 1.3.5 (Windows 32-bit binary) showed as below.



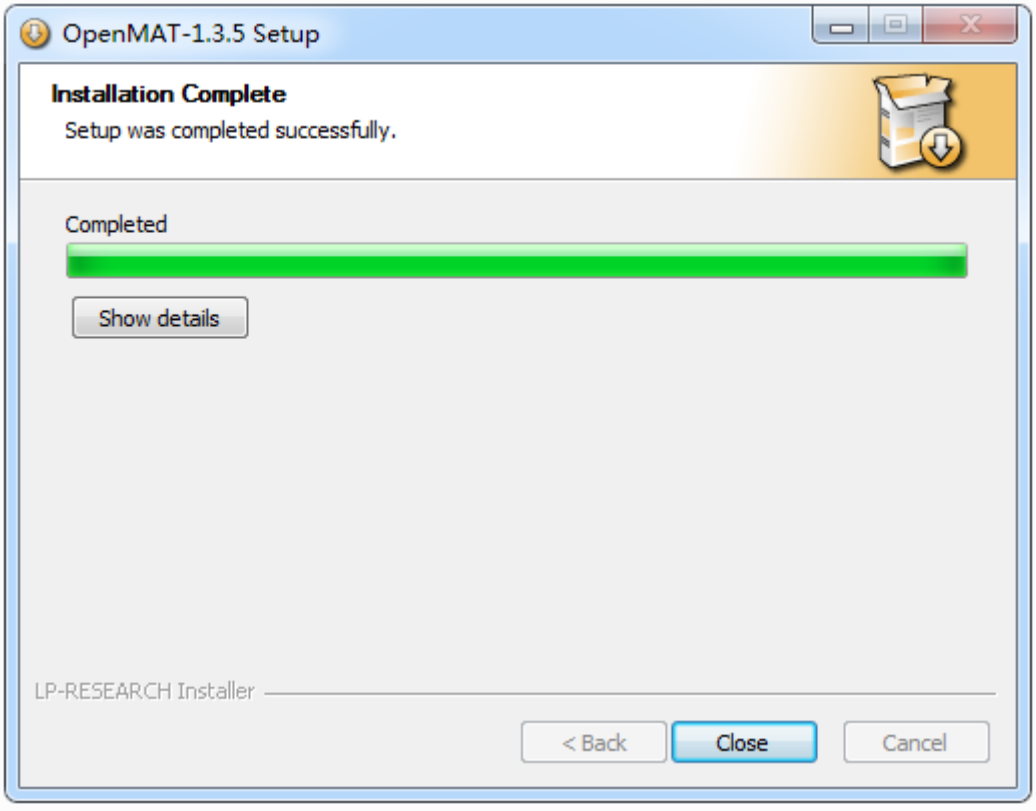
2) Run the installer after the download process is finished, and push the "I Agree" button for the next step.



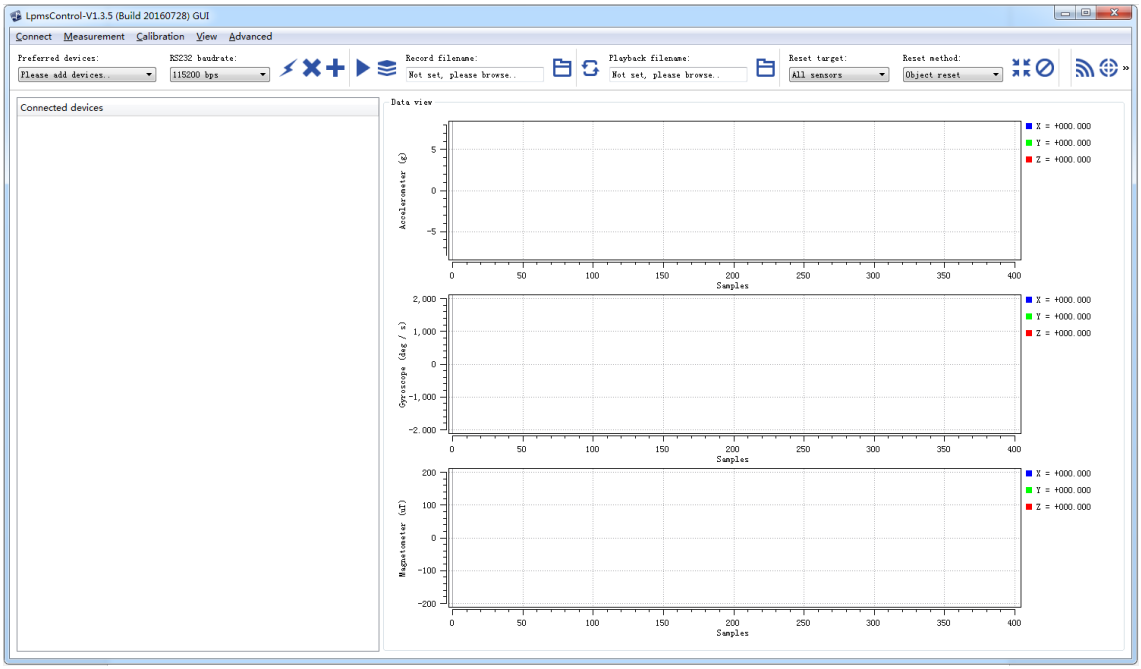
3) Push the "Browse" button to select the installation path of the program, and then push "Install" to start the installation process.



4) Push the "Close" button to complete the installation.



To run the LpmsControl software from the start menu of your windows system, you can see the following interface.



2. Connection with PC

LPMS-U2 series, depending on the sensor part number, can communicate with a host system via either USB, CAN Bus, RS232 or TTL(UART) interface. **Notice: Only one interface is allowed to be used at a time.**

The USB port is aimed at connecting with a windows OS based host system for the sensor. User can change the sensor settings and acquire sensor data by using our LpmsControl software.

The CAN BUS port is aimed at connecting with various types of industrial host systems via the CAN+ and CAN- Bus. Users can change the sensor settings and acquire sensor data based on our CAN communication protocols.

The RS232 port is aimed at connecting with various types of industrial host systems via serial communication. Users can change the sensor settings and acquire sensor data based on our LPBUS communication protocols.

The TTL(UART) port is aimed at connecting with various types of industrial host systems via serial communication. Users can change the sensor settings and acquire sensor data based on our LPBUS communication protocols.

The use of each interface at a windows operation system is introduced in the following sections.

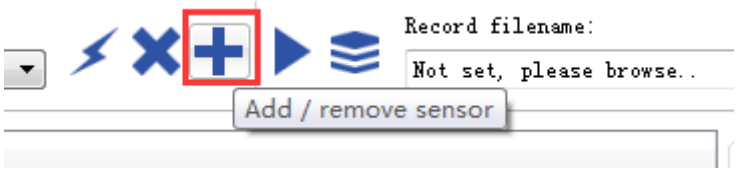
Via USB Interface

Users can connect all LPMS-U2 series sensors to a PC via USB port. After plugging in, windows operation system will activate the installation of USB drivers automatically. USBXpress device will be showed up in the device manager if the driver has been installed successfully, seen as following.

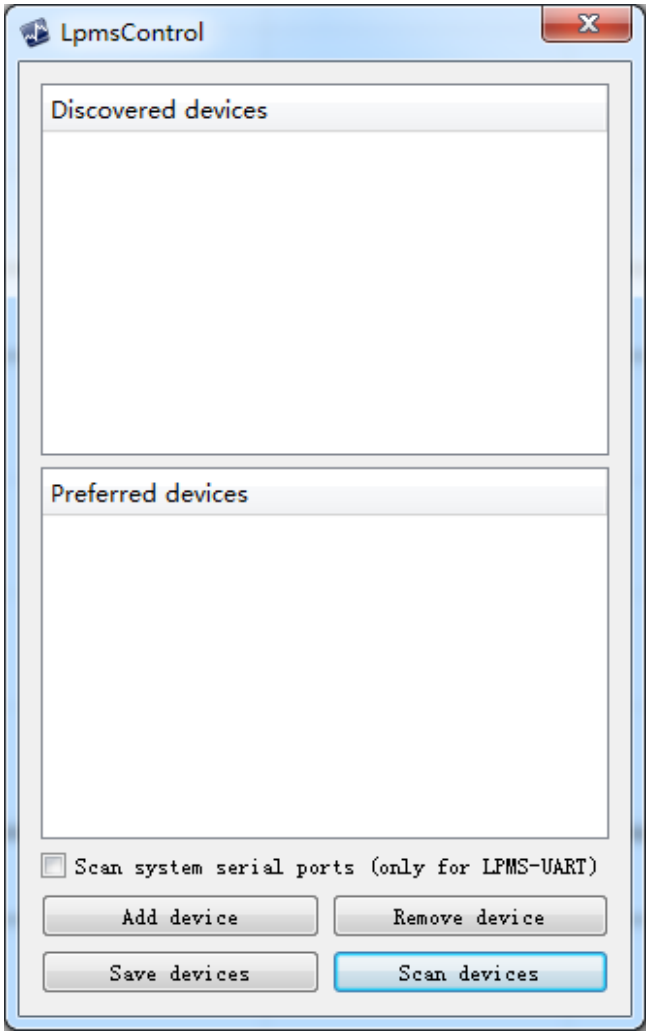
After connecting the sensor to PC, the LED on the sensor should behave like a pulsating light at blue color, which indicates the sensor is functionally working.

Please follow the instructions below to complete the remaining steps.

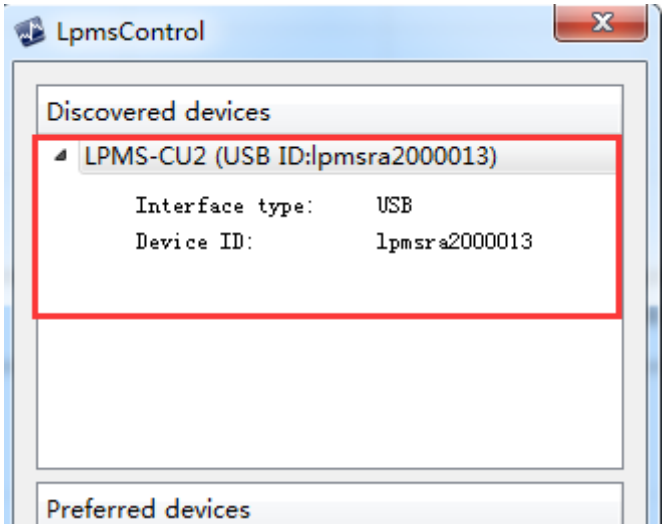
1) To select the "Add/remove sensor" under "Connect" menu or click the "+" button on toolbar of LpmsControl.



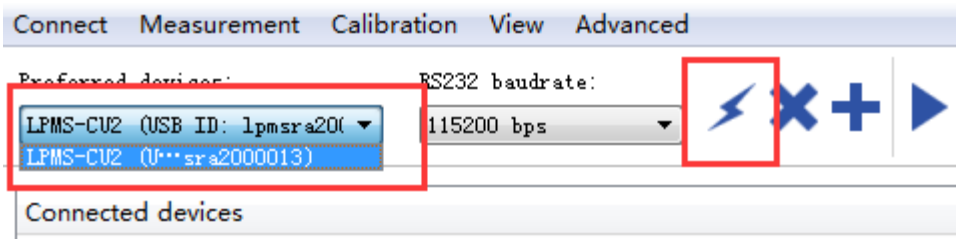
The "add device" window will pop out, as following.



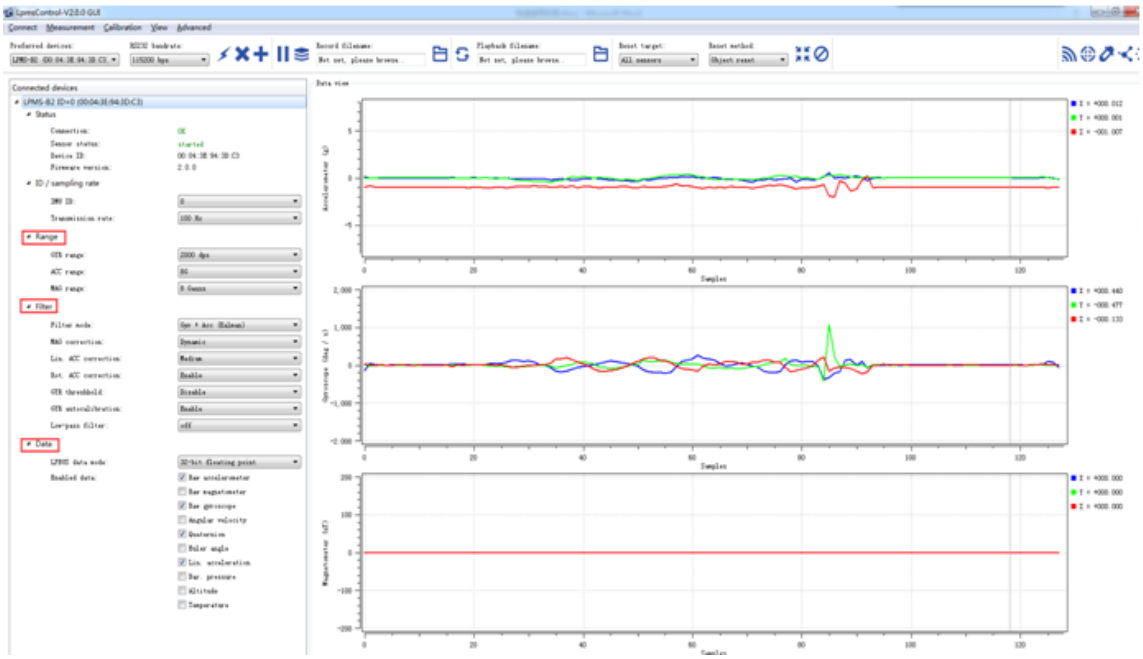
2) To click the "Scan devices" button and start the device discovery process. Please wait until the process is done.
3) To select the target sensor ID from the "Discovered devices" list, for example, "LPMS-CU2 (USB ID: lpmsra2000013)" in the following image.



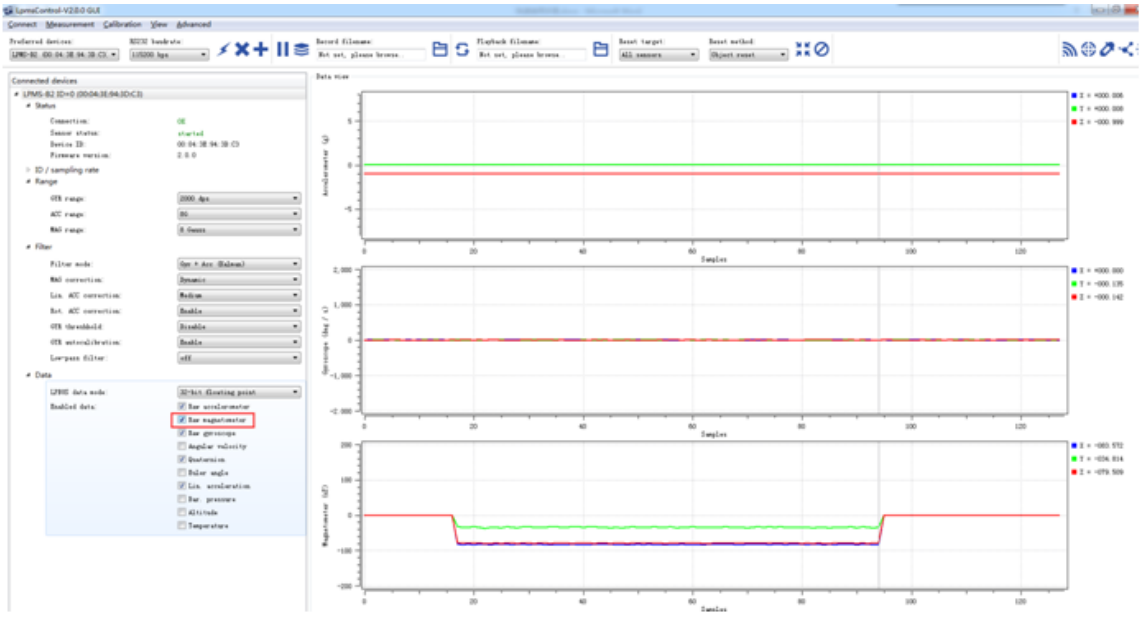
4) To add the selected sensor to "Preferred devices" list by clicking the "Add device" button.
5) To click the "Save devices" button to save the preferred devices list, and return to main interface of LpmsControl.
6) To select the target sensor ID from the Preferred devices list, and click Connect function under "Connect" menu or click the lightning button on toolbar to connect the sensor.



After completing all the steps above, the sensor should have been connecting with windows system. Users can check all the data visualization and parameter settings of the sensor from LpmsControl.



On the left side of the main interface of LpmsControl, users can change the sensor settings, like measurement range, filter modes, data updating rate, etc. Moreover, the types of output data can be modified by checking or unchecking the check box of each parameter. For example, in the following image the "raw magnetometer" is checked so that the acquisition of magnetic data is enabled.



Via CAN BUS Interface

In order to connect the LPMS-CU2 sensor to a PC via the CAN BUS port, a CAN-

to-USB converter is needed. LpmsControl software is supporting the PCAN-USB cable from PEAK-System Technik GmbH. The detailed information of PCAN-USB can be referred to: http://www.peak-system.com.

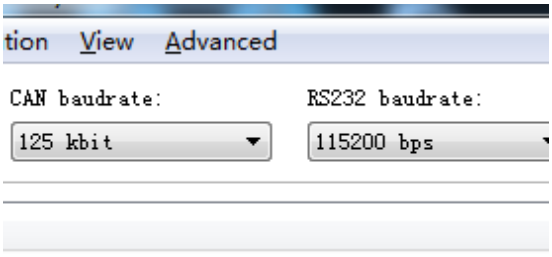
After connecting the PCAN-USB cable to a PC, the system will pop out a notice of driver installation. Please download and install the corresponding driver of PCAN-USB from the webpage of PEAK-System. The device manager of windows operation system will show the PCAN-USB device if the driver is installed correctly, as showed in the following image.

Before connecting LPMS-CU2 with PCAN-USB cable, the hardware setting of the DB9 port on PCAN-USB needs to be modified. In default, the pin no.1 of this DB9 port is not outputting 5V voltage. Please refer to section "Voltage Supply of External Devices" in the manual of PCAN-USB to have the pin no.1 output +5V.

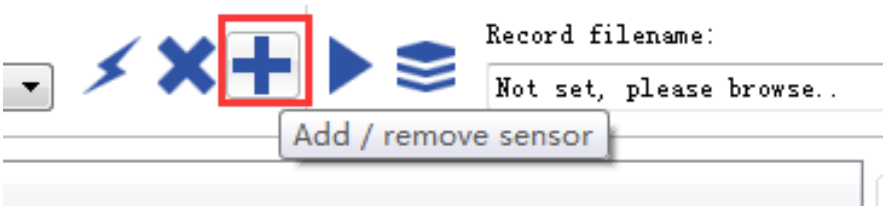
When the hardware setting of PCAN-USB is completed, users can connect it with LPMS-CU2 sensor. Then by plugging the PCAN-USB to PC, the LED on the sensor should behave like a pulsating light at blue color, which indicates the sensor is functionally working.

Please follow the instructions below to complete the remaining steps.

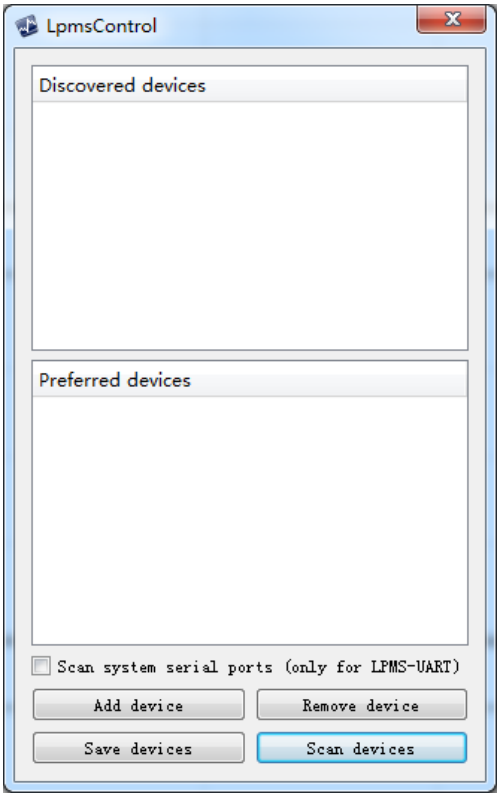
1) To start the LpmsControl software. If the PCAN-USB cable has been connected with PC, the CAN baudrate setting item should be showed up on the toolbar, seen as the following image. Please choose the correct baudrate according to your sensor setting. The default value is 125kbps.



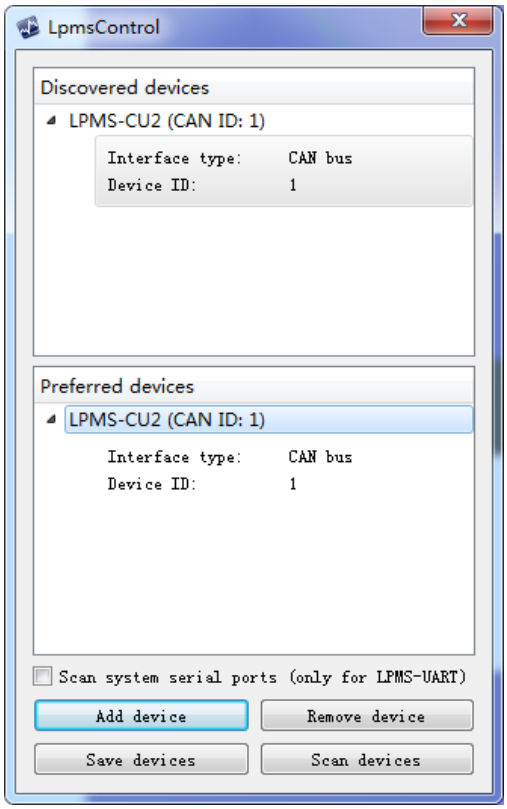
2) To select the "Add/remove sensor" under "Connect" menu or click the "+" button on toolbar.



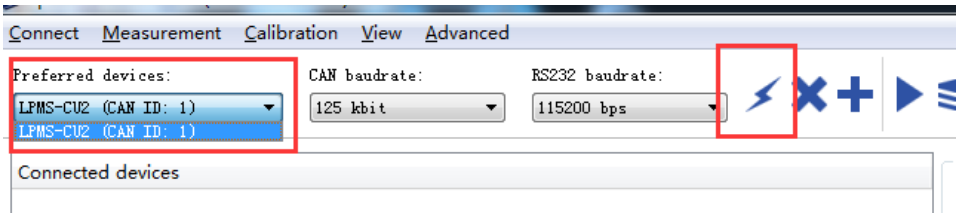
The "add device" window will pop out, as following.



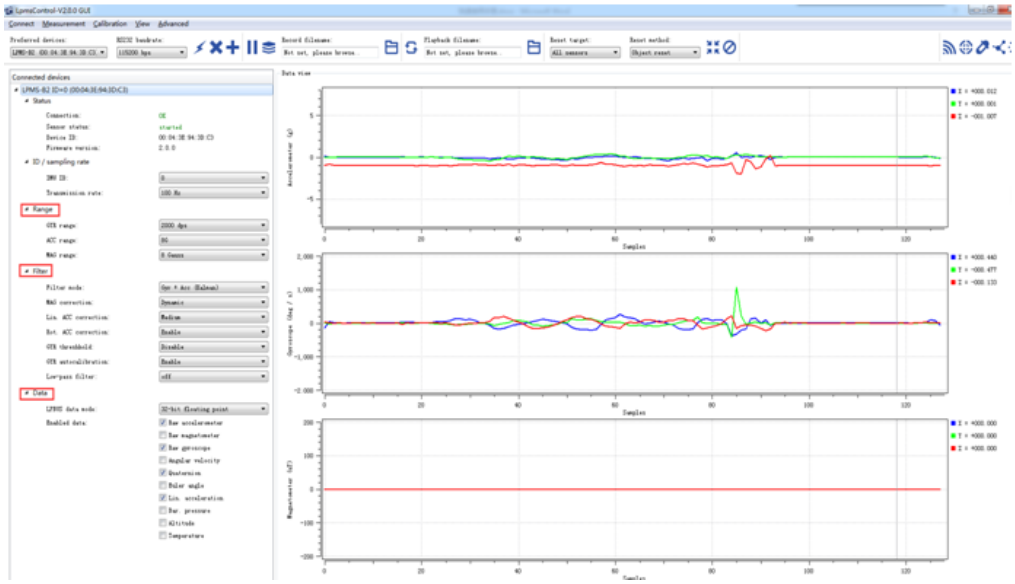
3) To click the "Scan devices" button and start the device discovery process. Please wait until the process is done.
4) To select the target sensor ID from the "Discovered devices" list, for example, "LPMS-CU2 (CAN ID: 1)" in the following image.



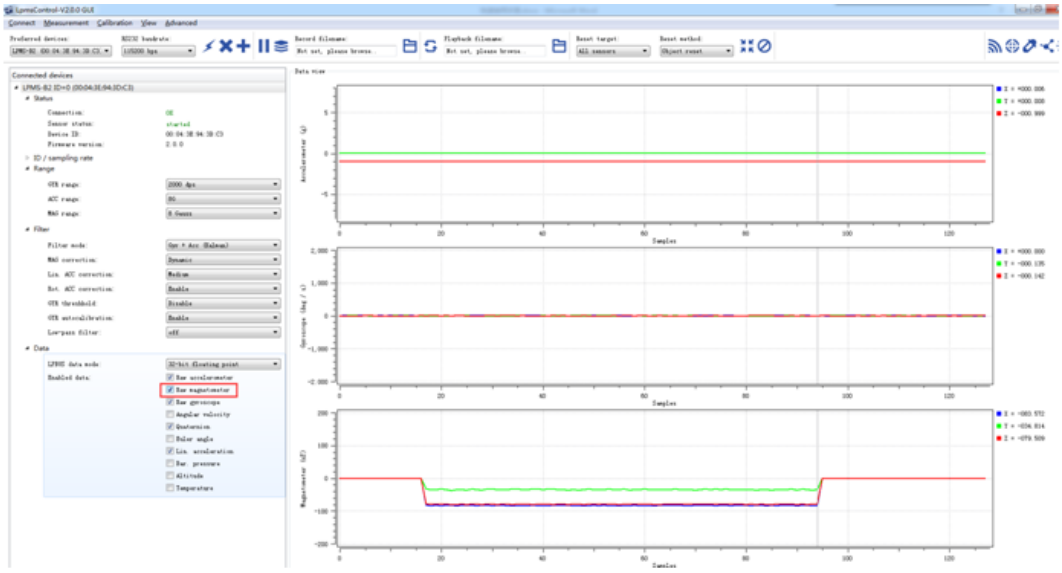
5) To add the selected sensor to "Preferred devices" list by clicking the "Add device" button.
6) To click the "Save devices" button to save the preferred devices list, and return to main interface of LpmsControl.
7) To select the target sensor ID from the Preferred devices list, and click Connect function under "Connect" menu or click the lightning button on toolbar to connect the sensor.



After completing all the steps above, the LPMS-CU2 should have been connecting with windows system. Users can check all the data visualization and parameter settings of the sensor from LpmsControl.



On the left side of the main interface of LpmsControl, users can change the sensor settings, like measurement range, filter modes, data updating rate, etc. Moreover, the types of output data can be modified by checking or unchecking the check box of each parameter. For example, in the following image the "raw magnetometer" is checked so that the acquisition of magnetic data is enabled.

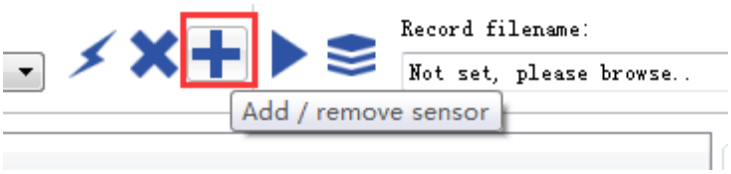


Via RS232 Interface

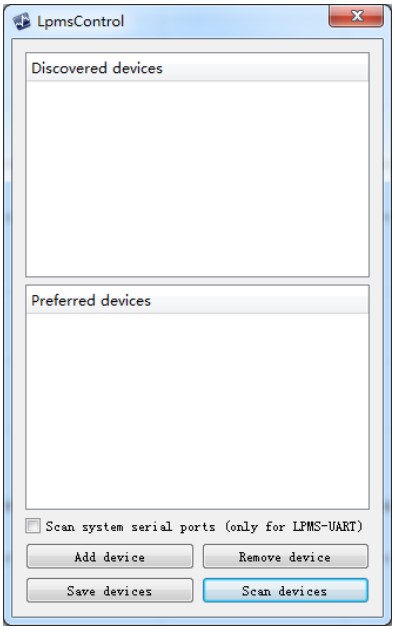
In order to connect the sensor to a PC via the RS232 port, a RS232-to-USB conversion cable is needed. Please connect the conversion cable with LPMS-URS2 sensor based on the pinout description in hardware manual. After plugging the conversion cable to a windows OS PC, a COM port is supposed to be assigned to the cable, which can be confirmed through the device manager of windows system. Please remember that COM port number and use it for the sensor connection. The LED on the sensor should behave like a pulsating light at blue color, which indicates the sensor is functionally working.

Please follow the instructions below to complete the remaining steps.

1) To select the "Add/remove sensor" under "Connect" menu or click the "+" button on toolbar.

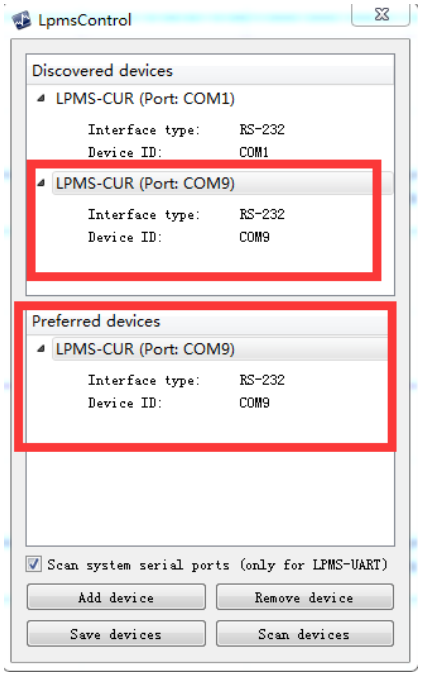


The "add device" window will pop out, as following.

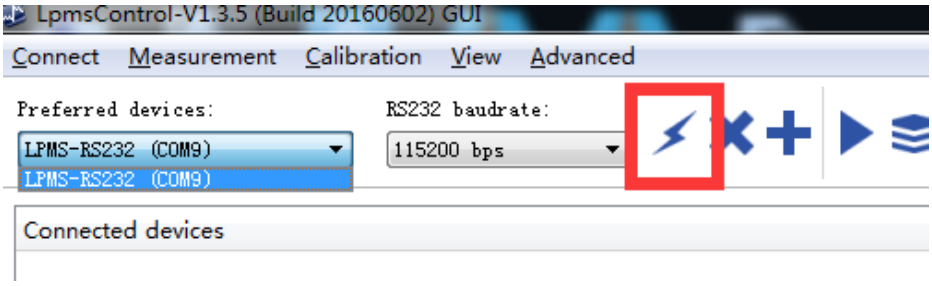


2) To check the option of "Scan system serial ports (only for LPMS-UART)" and click the "Scan devices" button to start the device discovery process. Please wait until the process is finished.
3) To select the target sensor ID from the "Discovered devices" list, for example, "LPMS-CUR(Port:COM9)" in the following image. This COM port should be same as the one of the conversion cable.

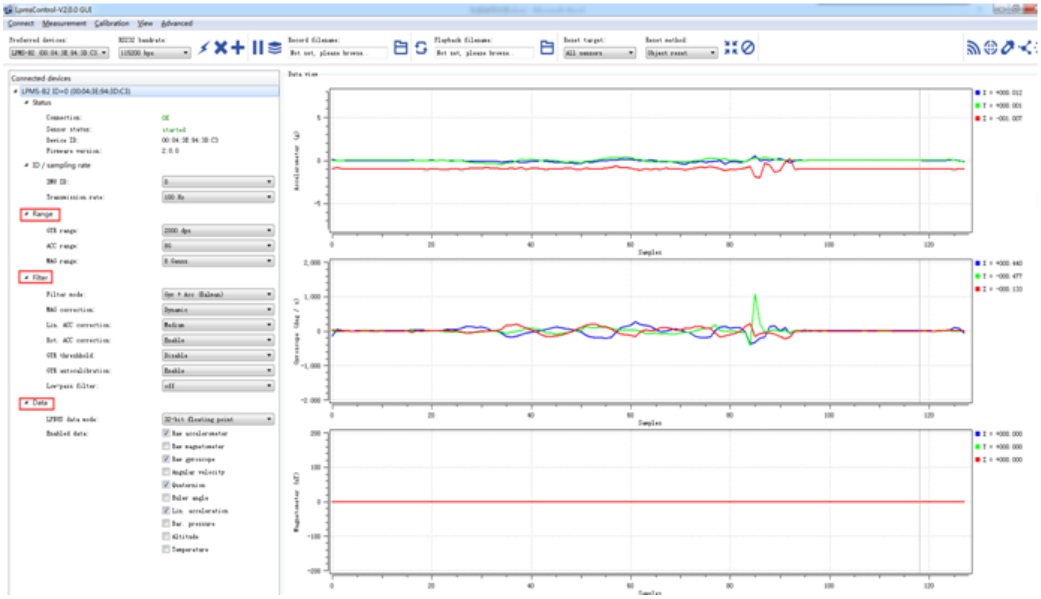
4) To add the selected sensor to "Preferred devices" list by clicking the "Add device" button.
5) To click the "Save devices" button to save the preferred devices list, and return to main interface of LpmsControl.



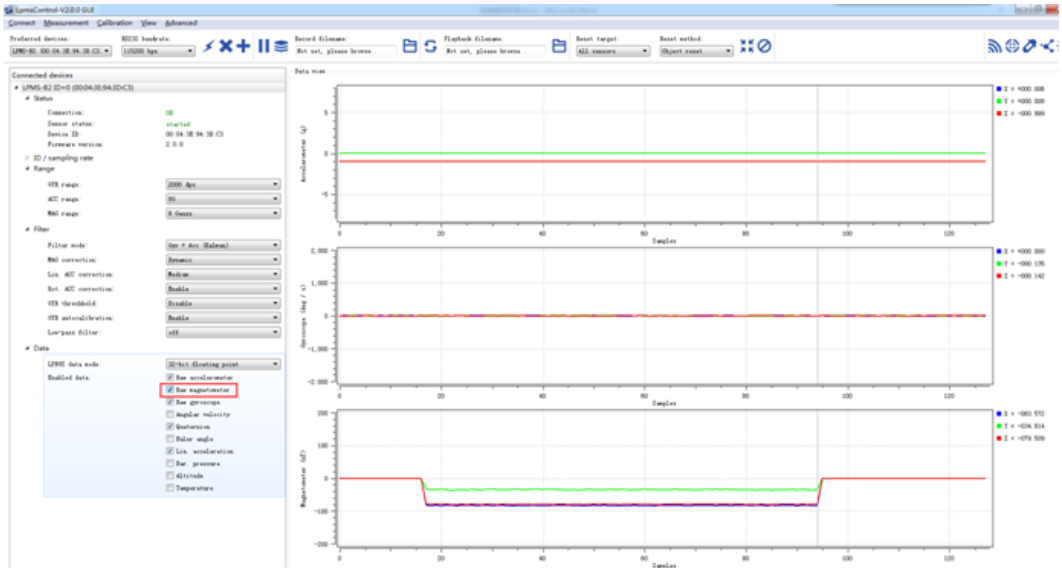
6) To select the target sensor ID from the Preferred devices list, and click Connect function under "Connect" menu or click the lightning button on toolbar to connect the sensor. Note: The default baudrate of RS232 communication is 115200bps.



After completing all the steps above, the LPMS-URS2 should have been connecting with windows system. Users can check all the data visualization and parameter settings of the sensor from LpmsControl.



On the left side of the main interface of LpmsControl, users can change the sensor settings, like measurement range, filter modes, data updating rate, etc. Moreover, the types of output data can be modified by checking or unchecking the check box of each parameter. For example, in the following image the "raw magnetometer" is checked so that the acquisition of magnetic data is enabled.



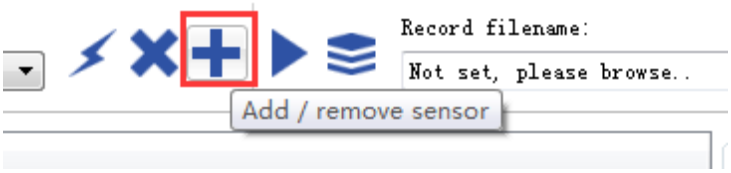
Via TTL(UART) Interface

In order to connect the sensor to a PC via the UART port, a TTL-to-USB conversion cable is needed. Please connect the conversion cable with LPMS-UTTL2

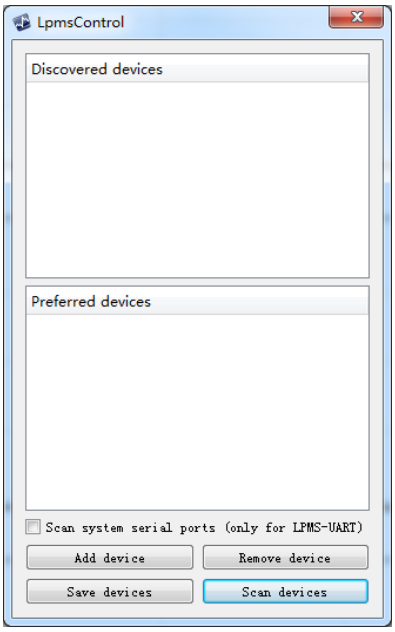
sensor based on the pinout description in hardware. After plugging the conversion cable to a windows OS PC, a COM port is supposed to be assigned to the cable, which can be confirmed through the device manager of windows system. Please remember that COM port number and use it for the sensor connection. The LED on the sensor should behave like a pulsating light at blue color, which indicates the sensor is functionally working.

Please follow the instructions below to complete the remaining steps.

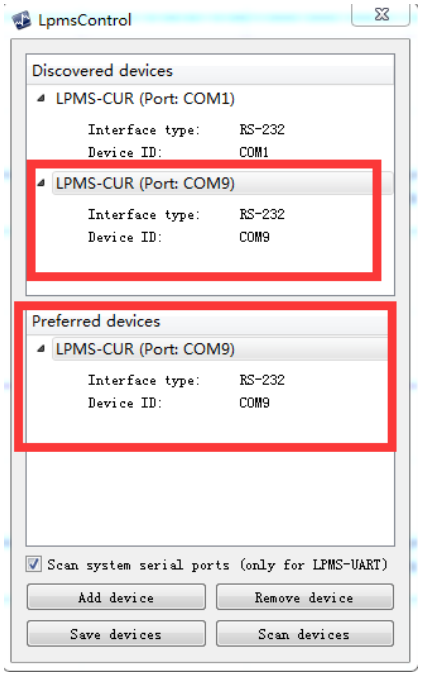
7) To select the "Add/remove sensor" under "Connect" menu or click the "+" button on toolbar.



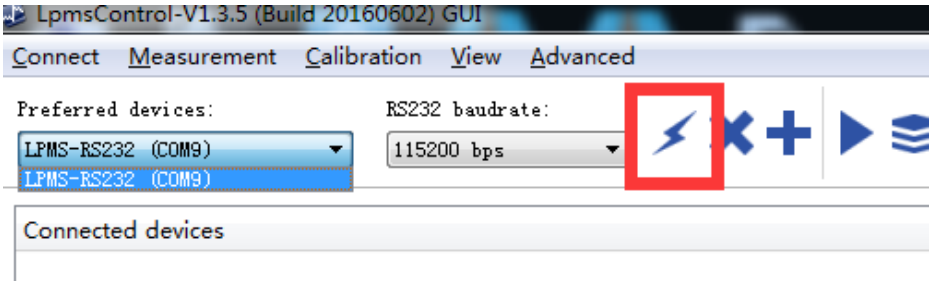
The "add device" window will pop out, as following.



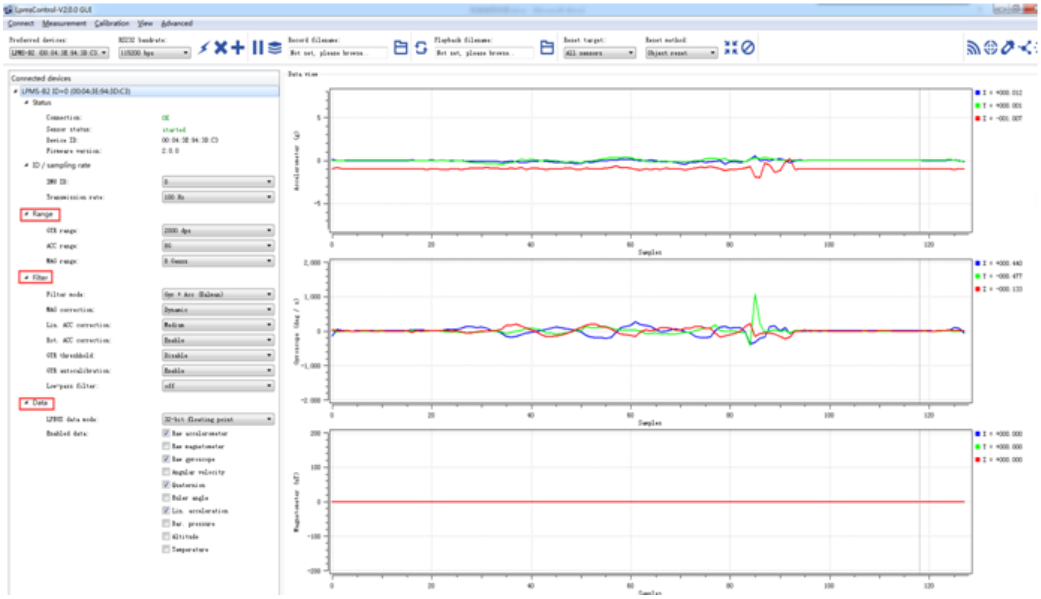
8) To check the option of "Scan system serial ports (only for LPMS-UART)" and click the "Scan devices" button to start the device discovery process. Please wait until the process is finished.
9) To select the target sensor ID from the "Discovered devices" list, for example, "LPMS-CUR(Port:COM9)" in the following image. This COM port should be same as the one of the conversion cable.
10) To add the selected sensor to "Preferred devices" list by clicking the "Add device" button.
11) To click the "Save devices" button to save the preferred devices list, and return to main interface of LpmsControl.



12) To select the target sensor ID from the Preferred devices list, and click Connect function under "Connect" menu or click the lightning button on toolbar to connect the sensor. Note: The default baudrate of UART communication is 115200bps.



After completing all the steps above, the LPMS-UTTL2 should have been connecting with windows system. Users can check all the data visualization and parameter settings of the sensor from LpmsControl.



On the left side of the main interface of LpmsControl, users can change the sensor settings, like measurement range, filter modes, data updating rate, etc. Moreover, the types of output data can be modified by checking or unchecking the check box of each parameter. For example, in the following image the "raw magnetometer" is checked so that the acquisition of magnetic data is enabled.