Using Cebo-MSA64(W) in ProfiLab Expert

This document describes how to access Cebo-MSA64(W)
devices from ProfiLab Expert.

Common information

The interface from ProfiLab Expert to the Cebo MSA API allows to read information of sensors A1, B2, C3, D4, E5, F6, G7 and H8, which is the diagonal line across the 8x8 grid on which the sensors are placed. There are two modes supported:

- Raw mode: Sensor values are an intensity in range of 0 - 120%.
  Each sensor can be configured using its own intensity.
- Calibration mode: A calibration file, generated using Cebo MSA CAL lite, is used to transform intensities to physical values.

Library look up behavior

The ProfiLab Expert interface consists of three DLL files. The DLL to import into the project is **cebomsa-profilab-X.X.dll**. This library requires the Cebo MSA base library **cebomsa-X.X-x86.dll**. As USB communication is handled using the open source **libusb** library, the base library itself needs to load **libusb-1.0.dll**.

ProfiLab Expert stores the path to the top level DLL as full path in its project. It is unlike that this will fail to load, other than the file is really not accessible or corrupted. But it is common that loading this file fails due to **its dependencies** could not be found. The places where the DLL's are searched for is described on this Website.

A good way to handle this, is to place **cebomsa-X.X-x86.dll** and **libusb-1.0.dll** into the ProfiLab Expert installation directory, next to **ProfiLab40.exe**. This works well when directly working with ProfiLab Expert. In the case of the **Compile** feature, ProfiLab Expert already puts **cebomsa-profilab-1.0.dll** in the output folder. Copying the other two dependencies into the same folder completes the standalone project configuration.

Usage information

The interface uses the **DLL Import** feature that ProfiLab Expert offers as control to enhance its library. Follow the steps below to add a single instance.

Find DLL import in this section and add it.

From the controls properties ...

... add the cebomsa-profilab-1.0.dll.
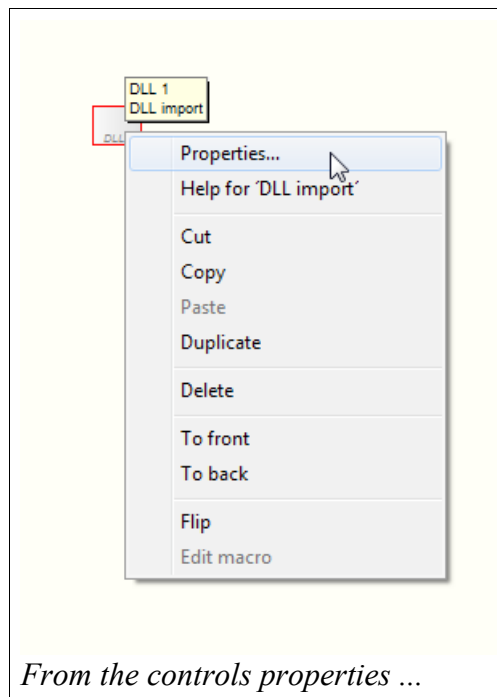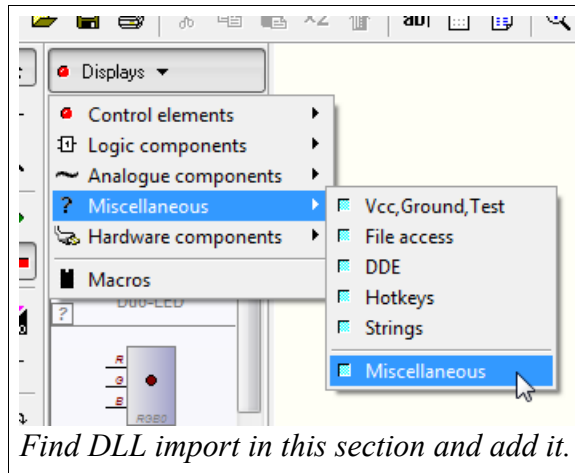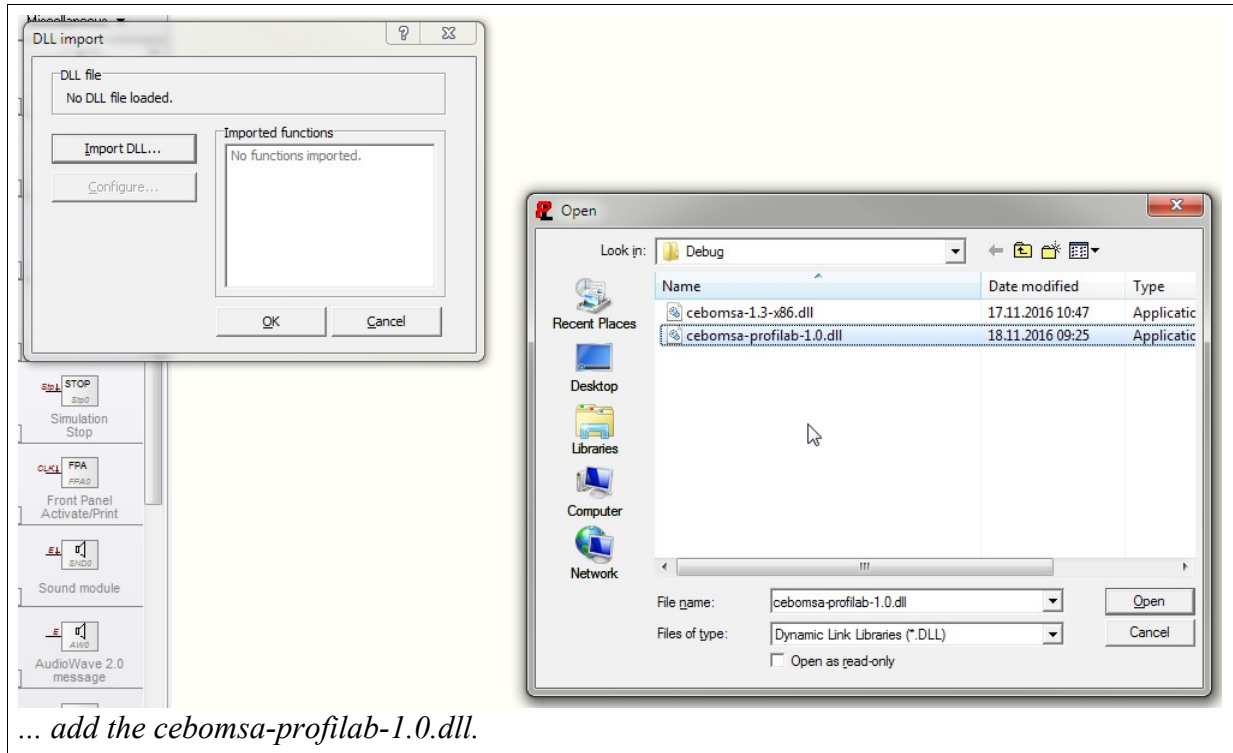
Interface configuration

Clicking on the **Configure ...** button in the controls properties opens the configuration dialog.

Configure the interface using the dialog.
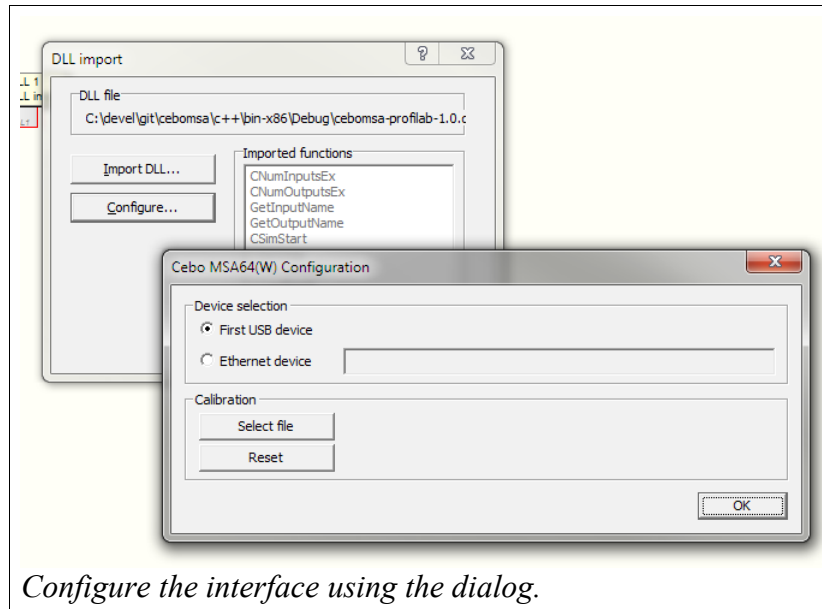
The most important setting is the choice of the device to use. If a Cebo-MSA64 is connected via USB, **First USB device** has to be used. In case a Cebo-MSA64W is accessible on the current network, **Ethernet device** must be selected. This requires the input field next to it must be filled with the IP address.

If a calibration file from Cebo MSA CAL lite should be used, this can be loaded using the **Select file** button below. The configuration is loaded every time the simulation gets started. So if the file is updated in Cebo MSA CAL lite, restarting the process inside ProfiLab Expert is enough to update the contents. The **Reset** button returns to raw mode behavior and removes the link to the calibration file.

Behavior

As mentioned above, the control can act in two different modes.

General

In both modes, the control has a **HasError** signal and an **Error** description (string). The has error signal is 0.0 as long as no error has been detected, while the error string is empty in this case. If an error occurs, the error signal switches to 5.0 and the error string contains a descriptive information about the error, e.g. that the connection to the device has been lost. In the current implementation, restarting the simulation is the only way to clear the error.

On the input side, the **Average** input can be used to calculate a mean value from the last N samples. If unconnected, ProfiLab Expert sets this value to five, so the last five frames are used for the calculation.

Raw mode

This mode is active if no calibration file is active. The control has eight sensitivity (**Sens**) inputs and eight **Sensor** outputs. A modification on the sensitivity directly affects the assigned sensor behavior. Sensitivities are valid in range of 0-63 and should be defaulted to 31. The sensor outputs emit the current intensity in range of 0-120 %.

Calibration mode

In calibration mode, the transformation of the sensor intensity to physical values is bound to a specific sensitivity (which is stored in the calibration configuration), so those inputs are hidden. On the output side, all sensors with calibration points output the transformed value, while the others just output the intensity like in raw mode.

Example application

The API includes the **PenPlotter** example for Cebo-MSA64 devices.
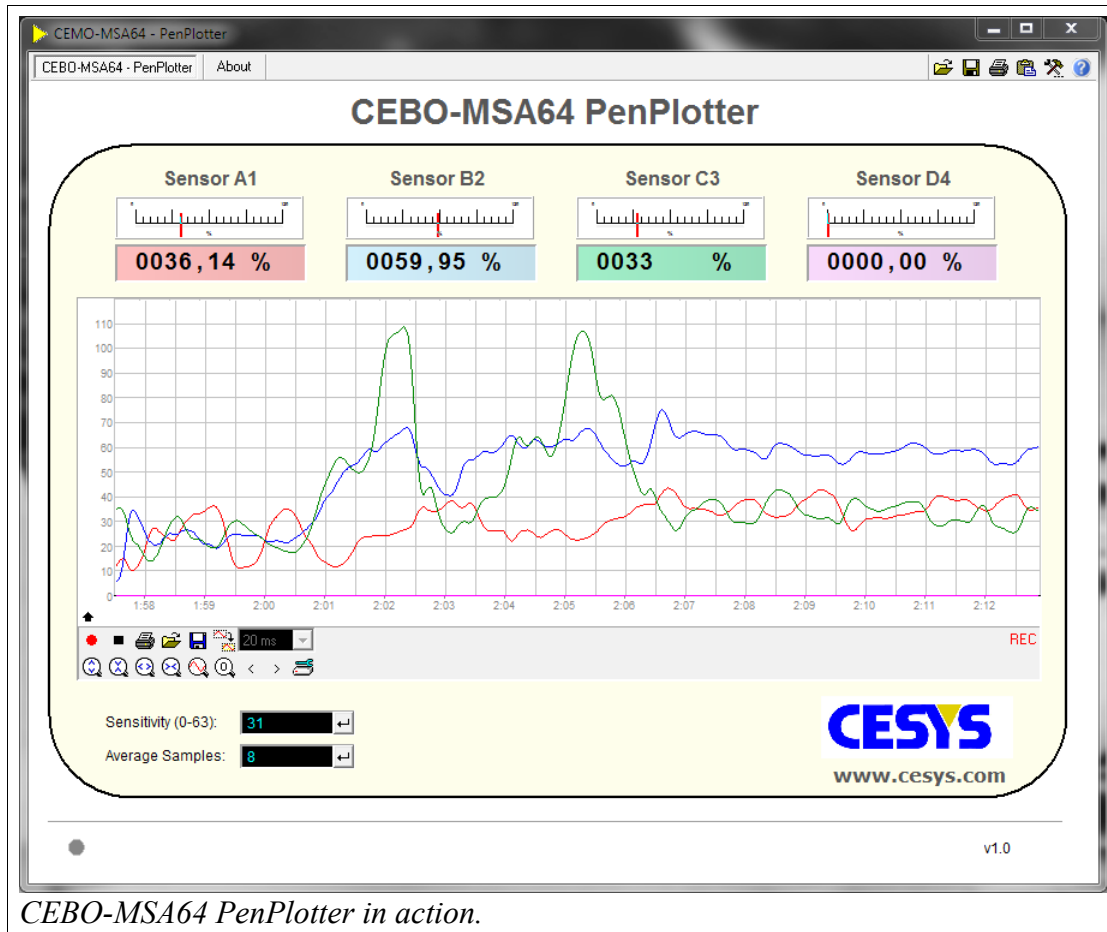
CEBO-MSA64 PenPlotter in action.

This example application displays the values of sensor A1, B2, C3 and D4 in the upper part of the window. The pen plotter directly below can be started by clicking on the red record button in the control section. More information about this control can be found in the ProfiLab Expert documentation.

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CRITICAL APPLICATIONS

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Revision history

Version	Date	Comment	Author	Approved
1.0	Jan, 20 2017	Initial release	th	th