TECH NOTE :: ClipX Integration in LabVIEW

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Brief description

This is an instruction to integrate ClipX in LabVIEW. Enclosed to this TechNote there are the following tools:

- LabVIEW Library for ClipX
- ClipX LabVIEW EasyDemo
- ClipX LabVIEW Demo

In the following the structure of the ClipX EasyDemo and the use of the ClipX LabVIEW Library are explained. After that there is a description of the ClipX LabVIEW Demo.

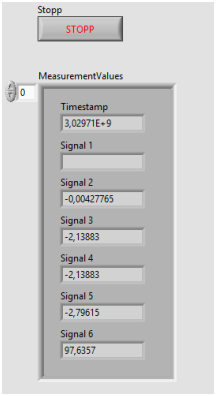


ClipX LabVIEW EasyDemo

The EasyDemo shows a simple structure of a LabVIEW program for performing a measurement with ClipX using its FIFO storage.
For the demos the ClipX LabVIEW library 'HBM ClipX Api.lvlib' is used. This library is not protected and can be used for own LabVIEW implementations. It contains to following basic functions for operating ClipX:

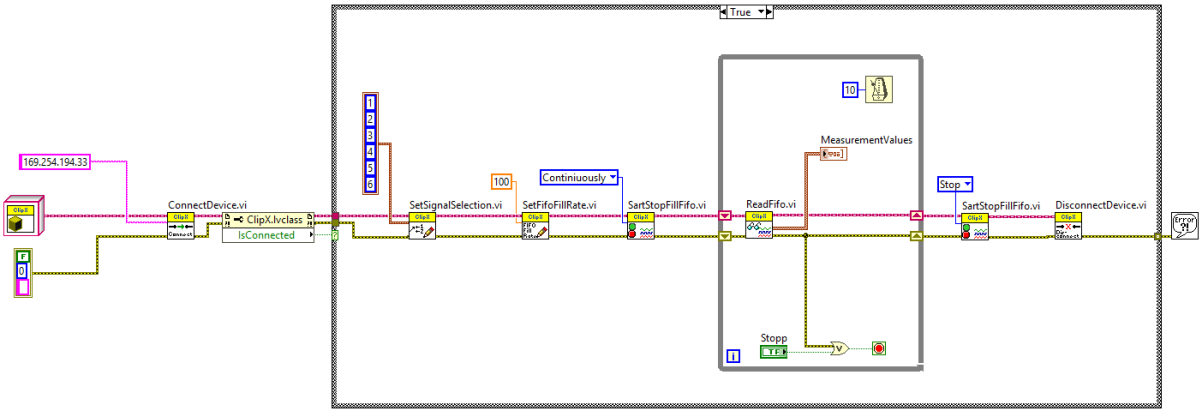
- ConnectDevice
- DisconnectDevice
- GetFifoFillRate
- GetSignalSelection
- GetTransducerSettings
- ReadFifo
- ReadSDO
- StartStopFillFifo
- SetSignalSelection
- Write SDO

To connect to ClipX the IP address has to be entered as a constant in the diagram.



As soon as the program is started, it connects to ClipX and starts the measurement (start via LabVIEW). It is stopped by clicking the 'STOPP' button. If the measurement is stopped, the program disconnects from ClipX and closes.

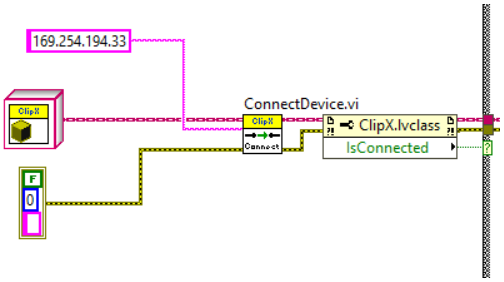
The block diagram looks like this:



Program flow

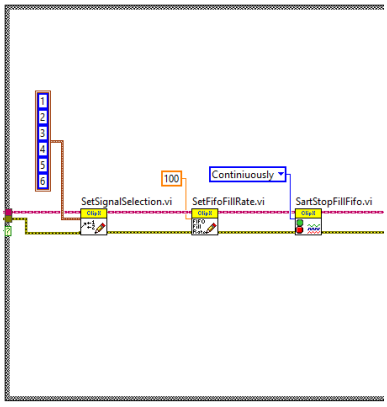
At first the function 'ConnectDevice.vi' is called which tries to connect to ClipX.

If the connection was successful it checks if the ClipX class is available. If it is not, the program is ended.

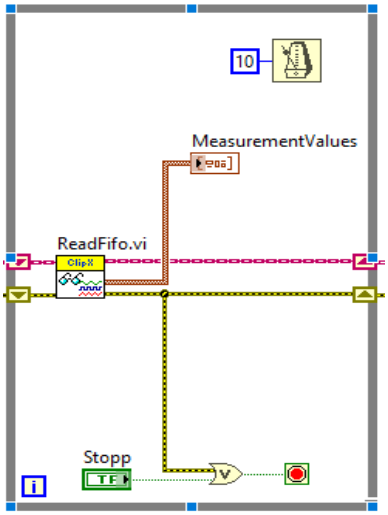


After that the function ‘StartSignalSelection.vi’ selects the signals to be measured. This happens here via constants.

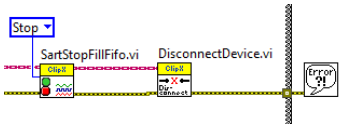
Now the FIFO rate is set (here: 100Hz; up to 1kHz possible) and the writing of the storage is started by the function ‘StartStopFillFifo.vi’.



The loop starts and reads the FIFO storage in 10ms (can be changed) intervals via the function ‘ReadFifo.vi’. The measurement can be stopped by clicking the ‘Stopp’ button. If an error occurs the program is also stopped.

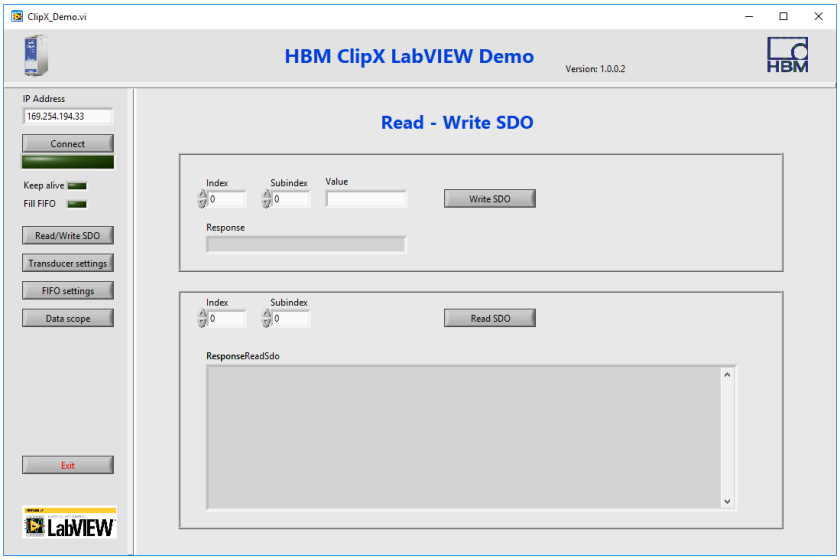


After stopping the measurement, the writing of the FIFO is terminated and the connection to the device is disconnected. The program stops automatically.



ClipX LabVIEW Demo

The LabVIEW Demo shows a more extensive implementation to measure with ClipX.



Entering the IP address in the box at the top left and then clicking the 'Connect' button will establish the connection to the ClipX. If the connection was successful, the button below 'Connect' shines green.

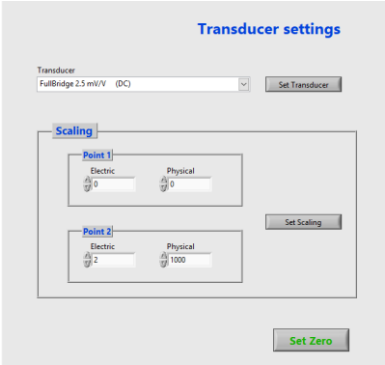
Read/Write SDO:

In this menu there is the possibility to read/write out of/into the object directory via index and subindex.

Transducer settings:

Here the amplifier settings are made:

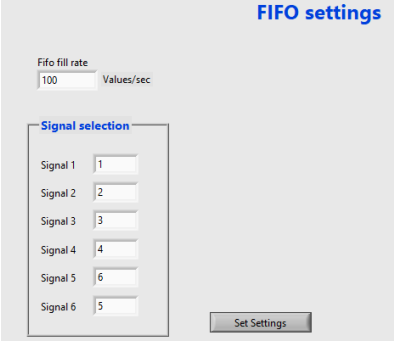
- Select the sensor type
- Set the scaling
- Zeroing the signal



FIFO settings:

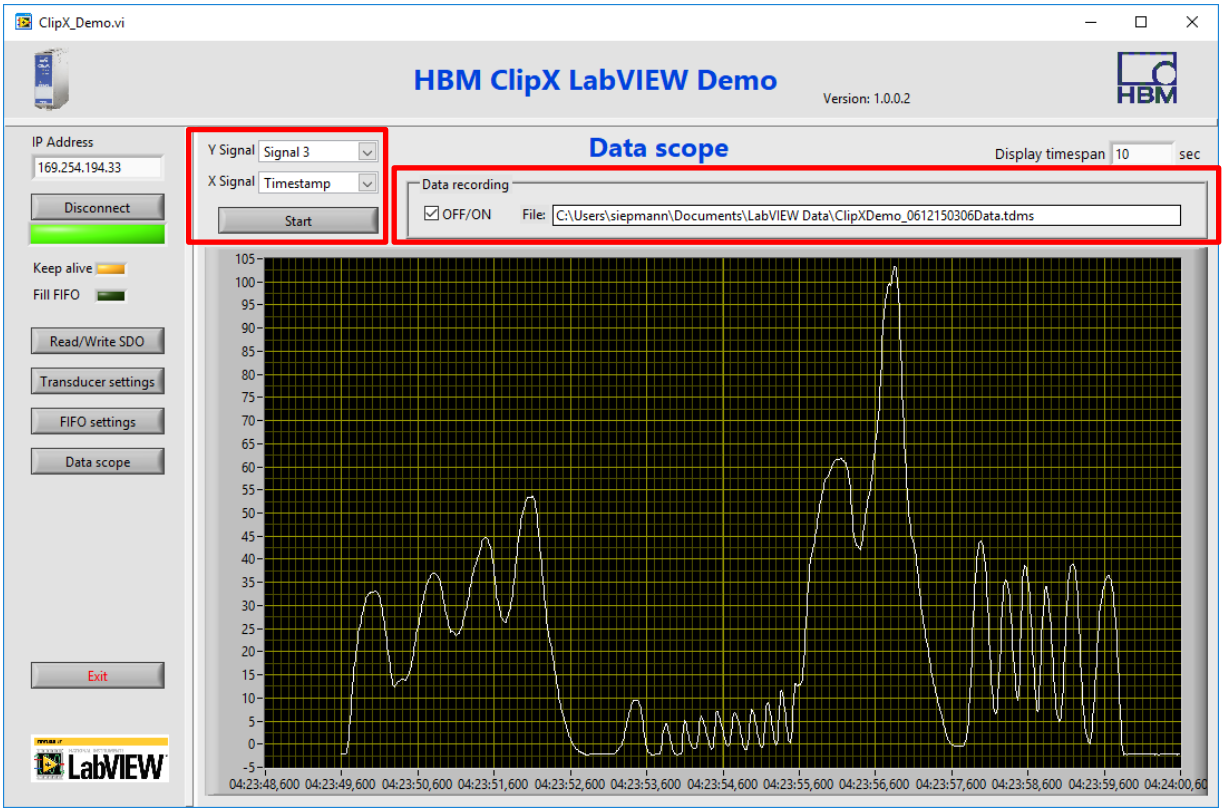
At this menu item the FIFO rate and the signals to be measured can be set.

Hint: The indices of the signals can be found in the 'ClipXEnums.xml' file.



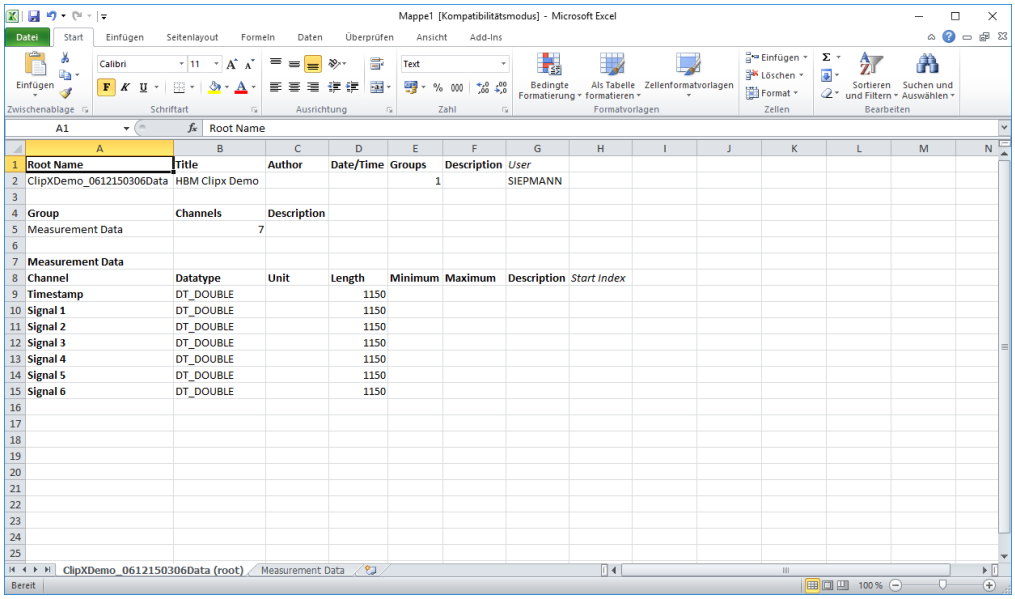
Data Scope:

At ‘Data Scope’ a measurement can be performed and visualized. As well as for the y axis,
Im Data Scope Menü kann eine Messung mit Visualisierung durchgeführt werden. Here, both a signal for the y-axis, and one for the x-axis can be selected. That makes it possible to create e.g. a force-displacement-diagram.
At ‘Display timespan’ the duration can be set after that the measurement values run out to the left of the visualization window. With ‘Start’ the measurement is started and at the same place stopped via ‘Stopp’.

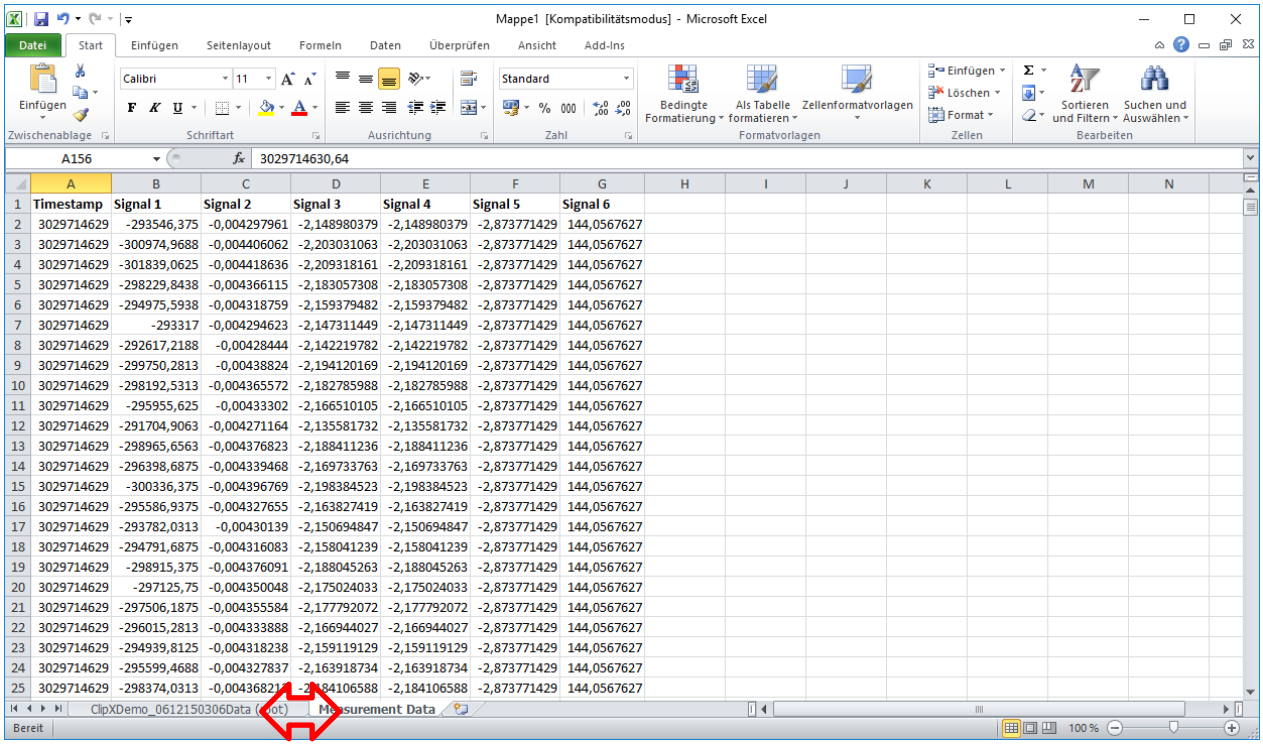


If desired the measurement can be stored by checking ‘OFF/ON’. The file is stored as .tdms file at the written path (Excel compatible).

The file looks like this:



The measurement data is on the second table sheet:



	Timestamp	Signal 1	Signal 2	Signal 3	Signal 4	Signal 5	Signal 6
2	3029714629	-293546,375	-0,004297961	-2,148980379	-2,148980379	-2,873771429	144,0567627
3	3029714629	-300974,9688	-0,004406062	-2,203031063	-2,203031063	-2,873771429	144,0567627
4	3029714629	-301839,0625	-0,004418636	-2,209318161	-2,209318161	-2,873771429	144,0567627
5	3029714629	-298229,8438	-0,004366115	-2,183057308	-2,183057308	-2,873771429	144,0567627
6	3029714629	-294975,5938	-0,004318759	-2,159379482	-2,159379482	-2,873771429	144,0567627
7	3029714629	-293317	-0,004294623	-2,147311449	-2,147311449	-2,873771429	144,0567627
8	3029714629	-292617,2188	-0,00428444	-2,142219782	-2,142219782	-2,873771429	144,0567627
9	3029714629	-299750,2813	-0,00438824	-2,194120169	-2,194120169	-2,873771429	144,0567627
10	3029714629	-298192,5313	-0,004365572	-2,182785988	-2,182785988	-2,873771429	144,0567627
11	3029714629	-295955,625	-0,00433302	-2,166510105	-2,166510105	-2,873771429	144,0567627
12	3029714629	-291704,9063	-0,004271164	-2,135581732	-2,135581732	-2,873771429	144,0567627
13	3029714629	-298965,6563	-0,004376823	-2,188411236	-2,188411236	-2,873771429	144,0567627
14	3029714629	-296398,6875	-0,004339468	-2,169733763	-2,169733763	-2,873771429	144,0567627
15	3029714629	-300336,375	-0,004396769	-2,198384523	-2,198384523	-2,873771429	144,0567627
16	3029714629	-295586,9375	-0,004327655	-2,163827419	-2,163827419	-2,873771429	144,0567627
17	3029714629	-293782,0313	-0,00430139	-2,150694847	-2,150694847	-2,873771429	144,0567627
18	3029714629	-294791,6875	-0,004316083	-2,158041239	-2,158041239	-2,873771429	144,0567627
19	3029714629	-298915,375	-0,004376091	-2,188045263	-2,188045263	-2,873771429	144,0567627
20	3029714629	-297125,75	-0,004350048	-2,175024033	-2,175024033	-2,873771429	144,0567627
21	3029714629	-297506,1875	-0,004355584	-2,177792072	-2,177792072	-2,873771429	144,0567627
22	3029714629	-296015,2813	-0,004333888	-2,166944027	-2,166944027	-2,873771429	144,0567627
23	3029714629	-294939,8125	-0,004318238	-2,159119129	-2,159119129	-2,873771429	144,0567627
24	3029714629	-295599,4688	-0,004327837	-2,163918734	-2,163918734	-2,873771429	144,0567627
25	3029714629	-298374,0313	-0,00436821	-2,184106588	-2,184106588	-2,873771429	144,0567627

Disclaimer

These examples are for illustrative purposes only. They cannot be used as the basis for any warranty or liability claims.