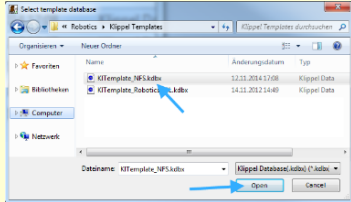
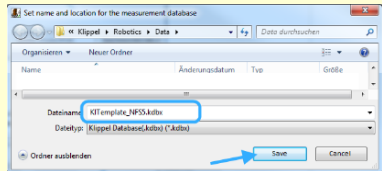


Quick Setup Guide – POL CEA2034 Measurement

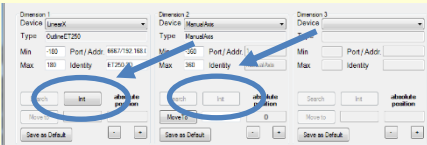
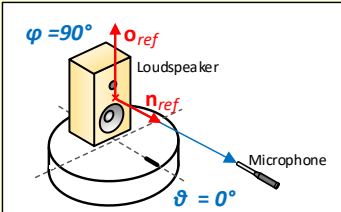
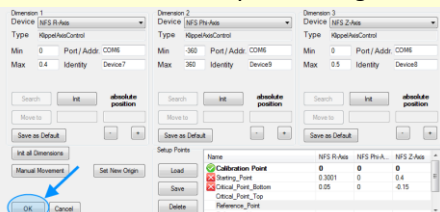


1 Start Klippel Robotics and Create New Measurement

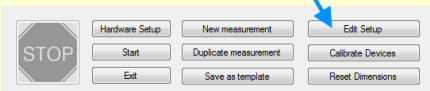
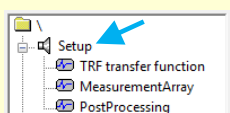
1) Start Klippel Robotics:  Open Robotics Software and click: "New Measurement" Hardware Setup New measurement Edit Setup Start Duplicate measurement Calibrate Devices Exit Save as template Reset Dimensions	2) Select Template: Choose "KITemplate_POL_CEA2034.kdbx". 	3) Select Results Path: Select a folder and a Name for the measurement database. 
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2 Hardware Setup

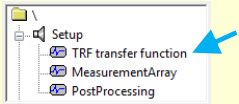
1) Open Hardware Setup: Click: "Hardware Setup" to open the hardware dialog window. Hardware Setup New measurement Edit Setup Start Duplicate measurement Calibrate Devices Exit Save as template Reset Dimensions	2) Select Turntables: Scan with 1 automatic Turntable 1) Select for Dimension 1 (theta) your Turntable (e.g. LinearX, ET250) 2) Select for Dimension 2 (phi) the Manual Axis 3) Make sure that Dimension 3 is empty Scan with 2 automatic Turntables 1) Select for Dimension 1 (theta) and 2 (phi) the Turntables (e.g. LinearX, ET250) 2) Make sure that Dimension 3 is empty Dimension 1 Device: LinearX Type: LinearXL360 Min: -180 Port / Addr: 5 Max: 180 Identity: 700237 Dimension 2 Device: ManualAxis Type: ManualAxis Min: -360 Port / Addr: 1 Max: 360 Identity: ManualAxis Dimension 3 Device: Type: Min: Port / Addr: Max: Identity: Dim1: Turntable (theta) Dim2: ManualAxis (phi) Dim3: No Device	Dimension 1 Device: LinearX Type: LinearXL360 Min: -180 Port / Addr: 5 Max: 180 Identity: 700237 Dimension 2 Device: ET250 Type: OutlineET250 Min: -180 Port / Addr: 6667/192.168.1.10 Max: 180 Identity: ET250-3D Dimension 3 Device: Type: Min: Port / Addr: Max: Identity: Dim1: Turntable 1 (theta) Dim2: Turntable 2 (phi) Dim3: No Device
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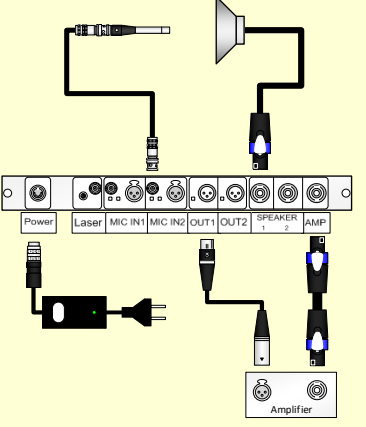
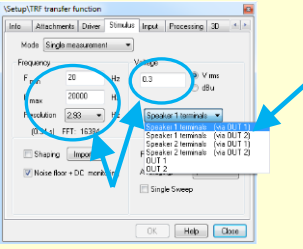
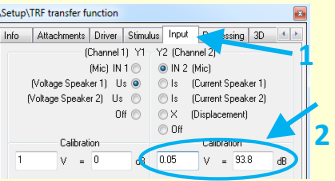
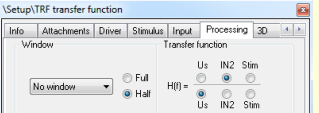
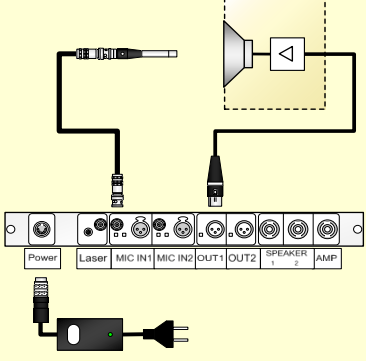
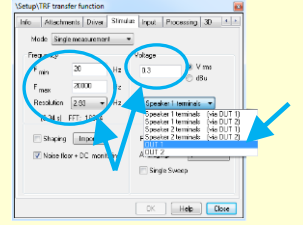
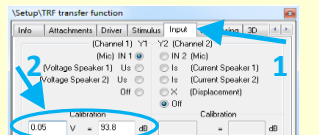
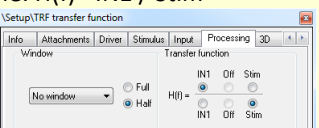
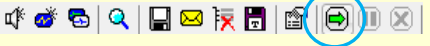
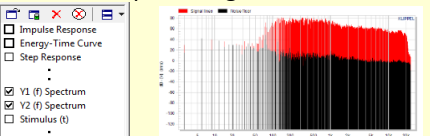
3) Initialize Axes Click the "Init"-Button of each axis.  In case the Initializing has failed, please check the Trouble Shooting below. (page 4)	4) Initial Position (On Axis) Make sure that the microphone is On-Axis when the turntable (Dim. 1) is in the zero position 	5) Close Hardware Settings: Click "OK" to confirm your Settings 
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3 Open Measurement Database

2) Open Database: Click "Edit Setup" to open the database. 	3) Select Setup Object: Select the "Setup". The Object consist of 3 Operation for measurement configuration 
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4 Measurement operation – TRF transfer function

1) Select operation Select the operation: "TRF transfer function" 	2) Properties Window: Open "Properties" Windows to configure the measurement operation. 
--	---

Passive Speaker	3) Connect Hardware 	4) Configure Stimulus Select the "Stimulus" tab and define: "Speaker 1 (via OUT1)" Configure Parameters Frequency Range, Frequency resolution and Input Voltage for your device 	5) Define Channels and H(f) 1) Select the "Input" tab and define: Channel 1 - (Voltage Speaker 1) U_s Channel 2 - IN 2 (Mic) 2) Insert the Calibration of the mic  3) Select the "Processing" Tab and define: $H(f) = IN2 / U_s$ 
Active Speaker		Select the "Stimulus" tab and define: "OUT1" Configure Parameters Frequency Range, Frequency resolution and Input Voltage for your device. 	1) Select the "Input" tab and define: Channel 1 - IN 1 (Mic) Channel 2 - Off. 2) Insert the Calibration of the mic  3) Select the "Processing" Tab and define: $H(f) = IN1 / Stim$ 
6) Run Operation Run the TRF operation by clicking on the green arrow.  The measurement should be performed in front of the loudspeaker. (On-Axis position)		7) Check SNR (Signal-To-Noise-Ratio) Open the Result Windows "Y1(f) Spectrum" and "Y2(f) Spectrum" And check if the microphone signal has a SNR of at least 40dB in the passband.  If the SNR is less increase the voltage of the Stimulus or apply averaging.	

5 Measurement Grid – MeasurementArray

1) Select Operation

Select the operation:
"MeasurementArray"

and open the Properties Windows.

See the "Documentation" window, for information about the parameters.

2) Configure Parameter:

Open the "Input" tab to configure the Parameter.

The CEA2034 Scan requires the following settings:

Scanning Dim.:	2D (Balloon)
Radius:	2 m
Dim 1 - Theta:	-180° to 170° 10° Resolution
Dim 2 - Phi:	-90° to 0° 90° Resolution

Scanning Dimensions		☐ 1D (Polar)
		☒ 2D (Balloon)
MEASUREMENT DISTANCE		
Radius	2	
DIMENSION 1: POLAR ANGLE THETA		
Theta Maximum	170	
Theta Resolution	10	
Theta Minimum	-180	
Turntable:	☒ Rotate Loudspeaker	
	☐ Rotate Microphone	
DIMENSION 2: CIRCULAR ANGLE PHI		
Phi Maximum	0	
Phi Resolution	90	
Phi Minimum	-90	
Turntable:	☒ Rotate Loudspeaker	
	☐ Rotate Microphone	

3) Run Operation

Run the MeasurementArray operation by clicking on the green arrow.

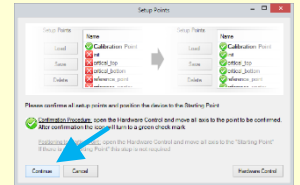
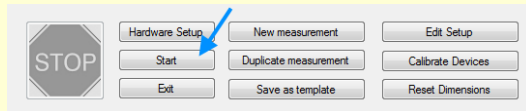
After running the Script, the distribution of measurement points is visualized in the result windows.

6 Start Measurement

1) Start Measurement

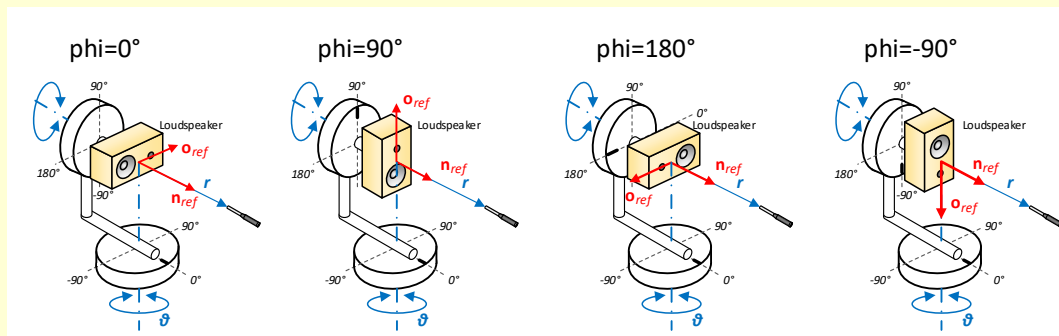
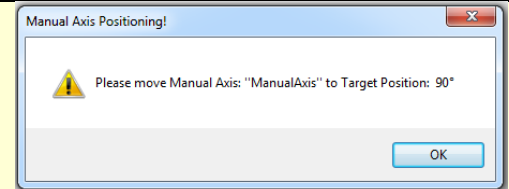
Close the database to get back to the Robotics and Press “Start”

Press “continue” to Start the measurement.



2) Manual Axis - Positioning

Performing the CEA 2034 Scan with only one turntable the second axis (phi) need to be positioned by hand. When the manual is required, the software will rise up a message box that shows the new angle position. The following pictures show, how the DUT must be positioned:

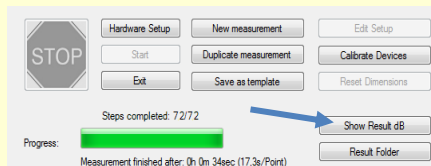


Positioning of Dimension 2 - Phi

8 Data Analysis

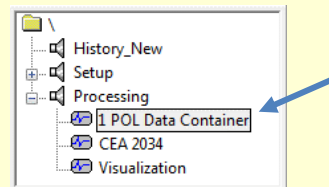
1) Open Database

After the measurement is finished, open the database by clicking “Show Result dB”.



2) Select Data Container

Select the operation: “POL Data Container”

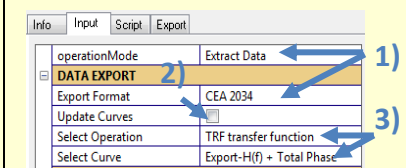


and open the Properties Windows.



3) Export Data

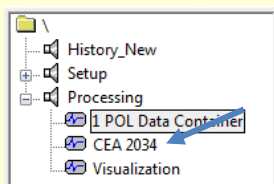
- 1) Select the Operation Mode “Extract Data” and the Export Format “CEA 2034”.
- 2) Click “Update Curves”
- 3) Select the Measurement Operation and Curve that should be analyzed. E.g. “H(f) + Total Phase”



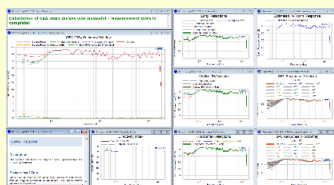
- 4) Start the operation.

3) CEA 2034 - Outputs

Select the operation: “CEA2034” and run the operation

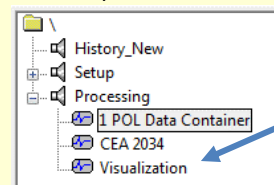


After running the script the result widows will show the specified CEA2034 curves.

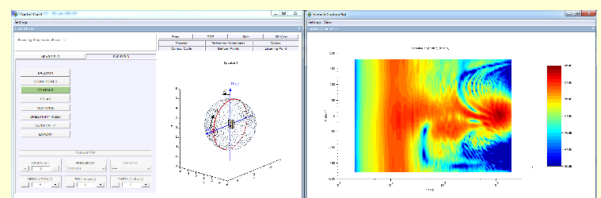


4) Visualization module

Select the operation: “Visualization” and run the operation



Running the script will open an interactive control panel where the data can be analyzed.

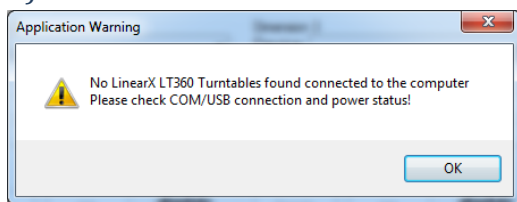


Trouble Shooting

Problems with LinearX Turntable

Error during Initialization

1) Linear is not connected

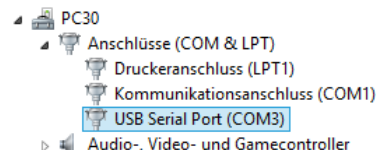


What to do?

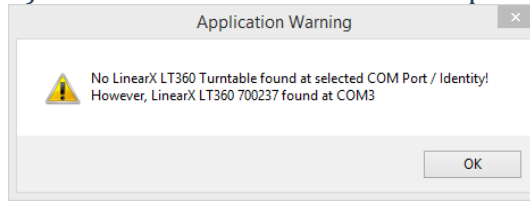
- 1) Check power connection of LinearX Turntable
- 2) Check COM-connection of the Turntable
 - a. Check if the cable is correct connected to the Turntable



- b. Check in the device manager if COM connector is available

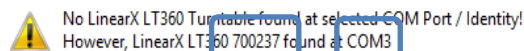


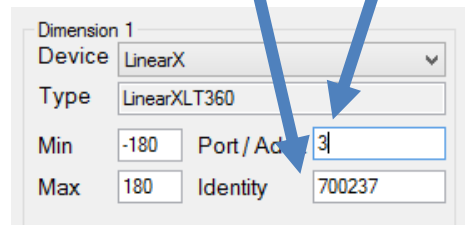
2) Linear is connected to another port



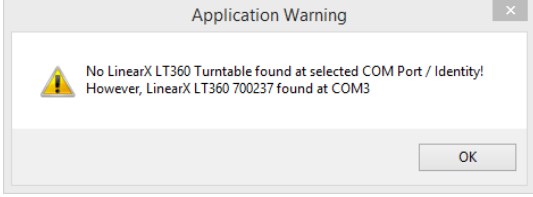
What to do?

- 1) Read the port and the Serialnumber from the messagebox.
- 2) Insert the correct Port and Serialnumber into the Hardware Setup





2) Linear is connected to another port



What to do?

1) Read the port and the Serialnumber from the messagebox.

2) Insert the correct Port and Serialnumber into the Hardware Setup

