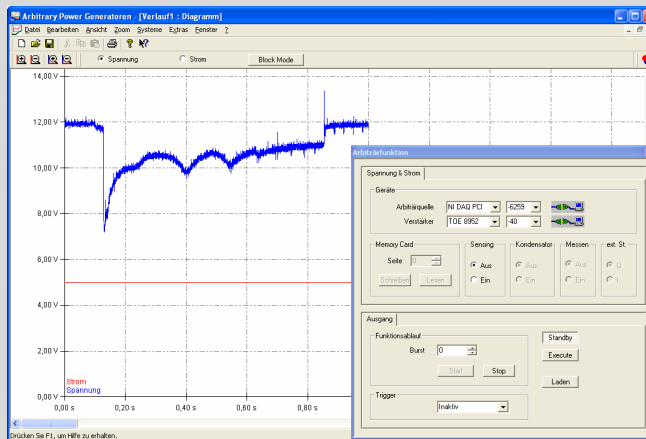


ArbNet



**Installation
and User's Guide
Version 2.0**

**Software for
Power Supplies
and Amplifiers**

Contents

Universal	3
Installation	5
System requirements	5
Software	5
Hardware	5
Installation	5
Hardware	9
Connecting the Power Supplies of the TOE 8950 series	11
Connecting the Power Supplies of the TOE 8840-and TOE 8850 series	12
Connecting the Power Supplies of the TOE 8870 series	13
Connecting the Four-Quadrant Amplifier TOE 7610	14
Connecting the Arbitrary Power Supplies of the TOE 88x5 series	14
Connecting the Arbitrary Power Supplies for Voltage Noise Simulation	15
Licence	16
Universal	16
The Program ArbNet	17
Wave File	18
Input of waves in a diagram window	20
Setting of the coordinate grid	20
Graphic input of the voltage	21
Graphic input of the current	21
Block mode input	22
Change to the color of the curve	23
Input of waves in the spreadsheet	24
Correction of the input	26
Interference	26
Input of a sine interference	27
Input triangle interference	28
Input square interference	28
Input charge and discharge curves	29
Macro File	30
Trigger File	32
Data import from oscilloscopes and files	34
Data takeover of signals in the MCD format (Memory Card drive format)	34
Data takeover of devices	35
Sequence input	35
Sequence with variable voltage amplitude	35
Sequence with variable time	37
Definition of systems	39
Power supply mode	39
Voltage noise simulation	40
Pulsegenerator	41
Arbitrary function	42
Sequence executing	45
Devices	48
Options	50
Info about ArbNet	51

Remote control of the software	52
Appendix A: GPIB controller	54
National Instruments	54
Agilent Technologies	55
Keithley	56
Appendix B: DAQ-Cards	57
National Instruments	57
Glossary	58
Figures	63

Imprint

Copyright © 2003-2007 TOELLNER. All rights reserved.

The contents of this document may be transmitted without previous written approval by TOELLNER in no form (pressure, photocopy, microfilm or in another procedure) neither completely nor partially multiplied, be spread or be stored.

All product names mentioned in this manual, company names, trade mark or registered trade mark are the property of her respective owners and should be treated as such.

TOELLNER develops this program according to his policy constantly. Therefore, TOELLNER reserves itself the right without carrying out previous announcement in each of the products described in this documentation changes and improvements. The software and the manual were provided with the biggest care. Nevertheless, no guarantee for the mistake freedom of the software, the provided data as well as the manual can be taken over. Because after the pressure lapping of the manual still changes were carried out in the software, the circumstances described in the manual or approaches can deviate possibly from the software.

TOELLNER is responsible under no circumstances for the loss of data and income or every special, casual, indirect or immediate damages, as usual, these have also come about.

The contents of this document are so presented as he is typically. TOELLNER takes over neither expressly nor tacitly at all a guarantee for the correctness or completeness of the contents of this document, including, but not limited on the silent guarantee, the market suitability and the suitability for a certain purpose, unless, applicable laws or jurisdiction prescribe compelling a liability. TOELLNER reserves itself the right, any time without carrying out previous announcement changes in this document or pulling back the document.



Universal

The software ArbNet from TOELLNER supports all Arbitrary power supplies of the series TOE 88x5, the achievement mains appliances of the series TOE 8870, compact mains appliances of the series TOE 8950, standard mains appliances of the series TOE 8840 and TOE 8850, as well as the 4 quadrant amplifiers TOE 7610.

They contain the input of curves, the data import from oscilloscopes, as well as the data transfer to the generators and the remote control of these devices. In addition, the curves will be scaled and transferred to the Arbitrary power supply as a signal giver another TOELLNER mains appliance or a TOELLNER 4 quadrant amplifier. As other signal givers DAQ Cards of National Instrument™ are applicable.

The program likewise supports the Memory Card Drive TOE 9030 from TOELLNER in his complete functionality.

The Design of curves occurs above a graphic surface slightly to be served. The curves can be provided without special program knowledge interactively. The curves can be also imported from an ASCII file, this makes sense especially with oscilloscope signals. The sequence function within the software permits the generation of automated test expiries. Curve expiries can be lined up by the macrofunction.

The program about the available Remote-DLLs can be integrated into existing test system.



Installation

System requirements

Software

The program is executable under the following operating systems:

Microsoft Windows 2000 Professional with Service Pack 4 or higher
Microsoft Windows XP Professional with Service Pack 1 or higher

For the software of the hardware manufacturers extensions are able to still like

Microsoft .NET Framework

be necessary.

Hardware

The computer must be enough at least for the following requirements:

Processor	Pentium III with 600 MHz or more comparably Pentium 4 or higher (is recommended)
Working memory	128 MB 256 MB or more (are recommended)
Free disk place	55 MB (for the installation 100 MB) 150 MB for Microsoft .NET Framework (200 MB for the installation)
Graphic	800 * 600 pixels with 256 colors
Disk drives	CD / DVD disk drive
Interfaces	accordingly of the next devices

Installation

For the installation it is urgently to be recommended to finish all the other programs before. With the help of the Windows-taskbar you see whether still programs are opened. Administrator's rights are necessary for the installation.

Install first the drivers of the additional hardware, like GPIB controller, DAQ Card and other interface cards or converters, if available, according to the manufacturer's default. Special driver's extensions as for example VISA Support are not necessary.

Insert the installation CD/DVD with the software for Arbitrary power generators from TOELLNER in her CD / DVD disk drive. Now the program should automatically start. If this

is not the case, search with the Windows-Explorer the CD / DVD disk drive and doubleclick on the program file **Setup.exe** which is in the uppermost level of the CD / DVD.

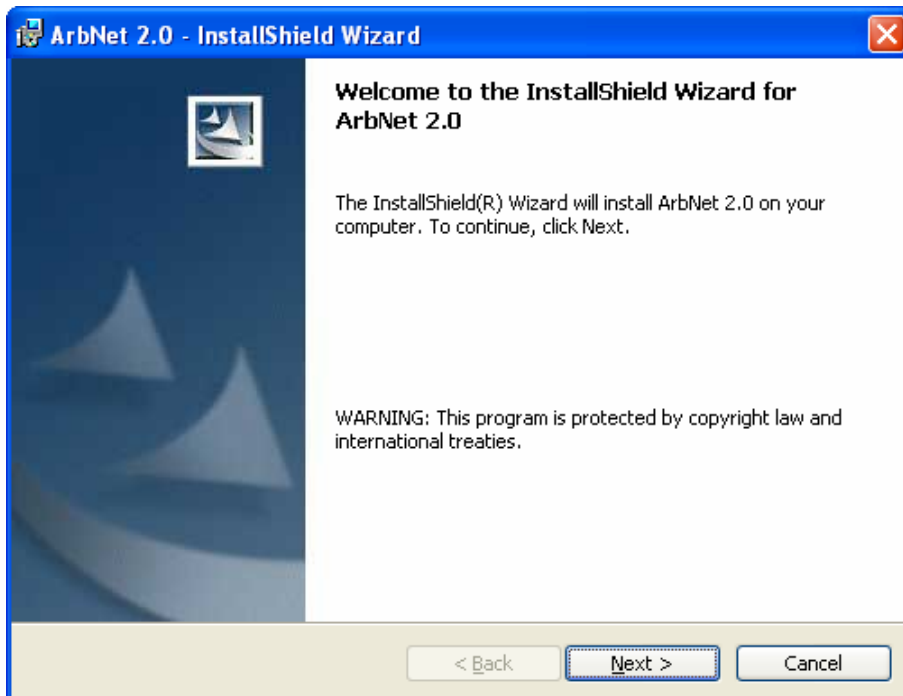


Fig. 1: Welcoming dialog of the installation program

The installation program at first extract itself and greets you then for the installation. Follow the instructions of the installation program and operate the suitable buttons.

In the course of the installation you are still asked for the installation list, here the default can be ordinarily taken over.

The program ArbNet is in two variations available which both are included in the installation file. If you used no DAQ Card from National Instruments, select the setup type **without DAQ-Card**, otherwise **with DAQ-Card**. The variation for DAQ cards is not executable without DAQ drivers of National Instruments and leads by the start to the fall.

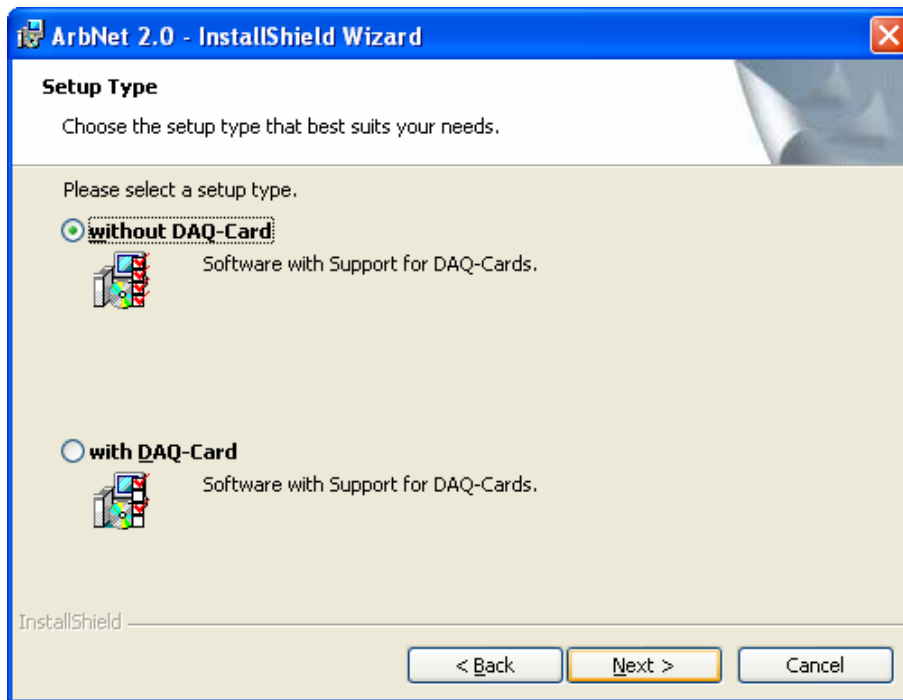


Fig. 2: Choice of the set-up type in the installation program

The course of the real installation is indicated you with the following window.

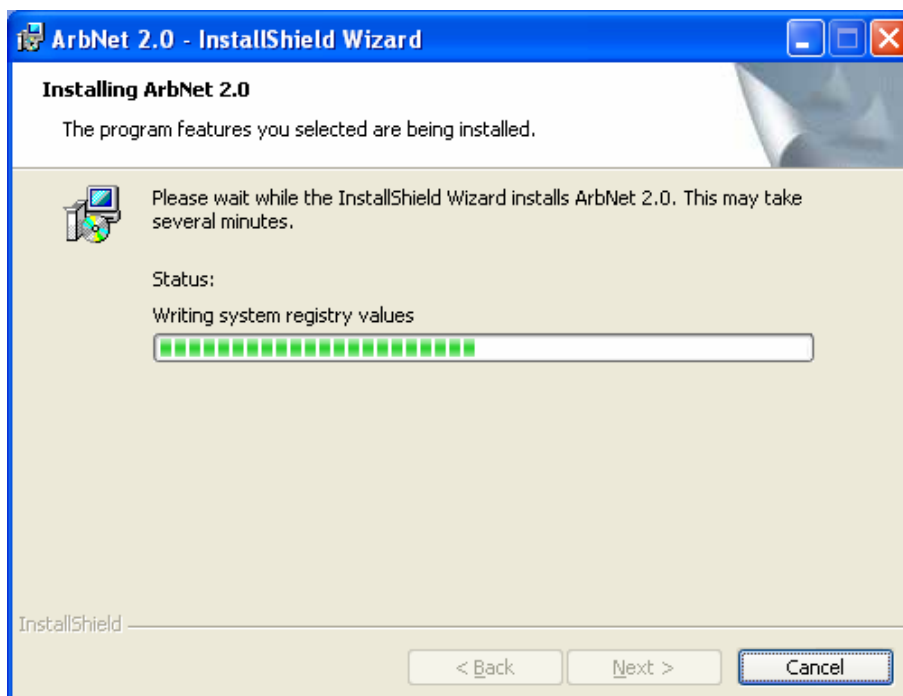


Fig. 3: Dialog box of the installation course

The successful installation is indicated by the suitable dialog box. It is possible that the computer must be restarted after the installation.

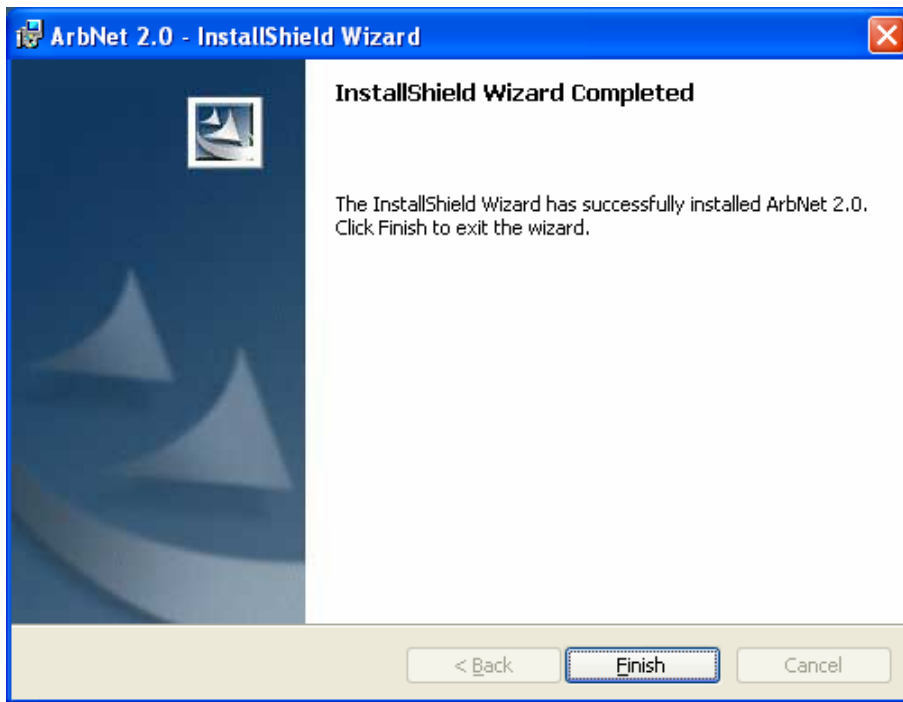


Fig. 4: End of the installation

The program supports different interfaces to the communication with the devices. Often becomes in the measuring technology the GPIB coach to the remote control of the devices used, partially this is also possible above optional interfaces (PCI, USB, PCMCIA, Ethernet).

If is to the PC a GPIB controller connected, the software communicates directly with the devices. The software supports the driver's parcels „ NI-488.2 for Windows “ from Nationwide instrument, "Agilent IO Libraries" of Agilent Technologies and the drivers „ CEC 488 “ from Keithley by which a huge number of GPIB controllers are available for different interfaces (PCI, USB, PCMCIA, Ethernet).

Above the 232 interface RS if data can be transferred to the map vintage device and writing utensil TOE 9030 from TOELLNER and to too different mains appliances.

DAQ Cards from National Instruments become by the software "NI-DAQmx" supports. DAQ Cards are available therefore for different interfaces (PCI, PCMCIA) for the analogous control of the different mains appliances and amplifiers.

Hardware

Different interfaces are supported by the software ArbNet. Therefore, it is necessary to get an overview above the necessary and available interfaces at first. The interface kind can be changed by the application of controllers. If necessary you must read up in the hardware description which interfaces exist on her computer and in the devices, because these can strongly vary on the computer and in the devices.

The interfaces on the computer are accessible from the outside. This are typically the following interfaces which can also exist several times.

- Printer connection (parallel port)
- RS232 (serial port)
- USB
- FireWire (IEEE 1394)
- Ethernet (IEEE 802.3)
- PCMCIA

Standard computers and Workstation have partially still internal extension possibilities by

- PCI Slots
- PCI Express train slots

By the installation of controllers / extension cards the computer disposes of other, from the outside accessible interfaces, how

- GPIB Coach (IEEE 488)
- RS 232 (serial port)
- PCMCIA / PC Card - slot
- Ethernet (IEEE 802.3)

or also special interfaces like

- analogous exits
- analogous entrances
- digital entrances (TTL).

Follow with the installation please the tips of the manufacturer and install, perhaps, necessary drivers according to the manufacturer's data.

By the devices the interfaces are accessible always from the outside. The interfaces must be partially bought as an option with the manufacturer. It is also possible that devices have several interfaces by which in each case only one can be used. This must be configured in the device accordingly. According to device and manufacturer the following interfaces can exist:

- GPIB
- RS 232
- USB
- Ethernet (IEEE 802.3)

Examine at first which devices and controller you want to connect and which interface you need for this.

Connecting kinds

Connections are necessary, about the commands can be transferred. About these commands you are able to control the devices remote. All actions which you can explain about commands are also practicable by hand directly in the device.

Commands will transfer always digitally as a suitable bit pattern. Besides, it makes no difference whether the transference occurs in parallel or serial.

A separate connection is necessary for the analogous tax signal of the devices. About this connection no commands can be transferred. The analogous tax signal is 0 – 5 V or 0 – 10 V of signal from a suitable spring, how DAQ Card or Arbitrary power generator.

Warning

They cannot close with the help of the plug type in the kind of the cable. Think please that every cable has two ends and this is provided, perhaps, with different plugs. use always the cables provided by the manufacturer. The provided cable with plug RJ45 is only for transferring of the analogous signals to the arbitrary power supplies or the other amplifiers. Put these cables not in the net socket of a computer or a network component. Otherwise, this could be damaged.

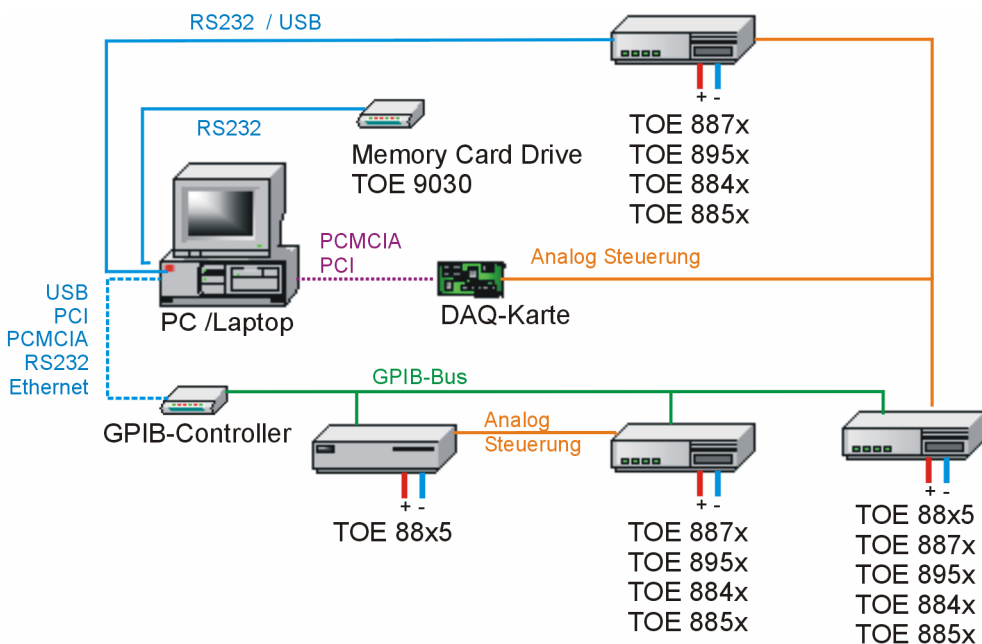


Fig. 5: General representation of the connection possibilities of the devices

Connecting the Power Supplies of the TOE 8950 series

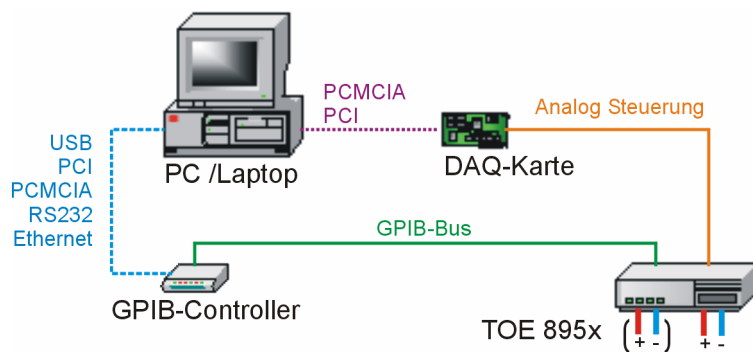


Fig. 6: Connection possibility compact mains appliance

The analogous tax signal is given by the PC about the DAQ Card.

If a GPIB controller (USB, PCI, PCMCIA, RS232, Ethernet) is connected, the commands can be transferred by the program. The commands bring the compact mains appliance in the right working condition and switch the exits e.g., in standby-or execute mode. Check the settings of the interface in the device according to the device description and make sure that the coach addresses were unambiguously awarded.

According to model row the compact mains appliance disposes of one or two exits. At both exits two different curves can be given at the same time.

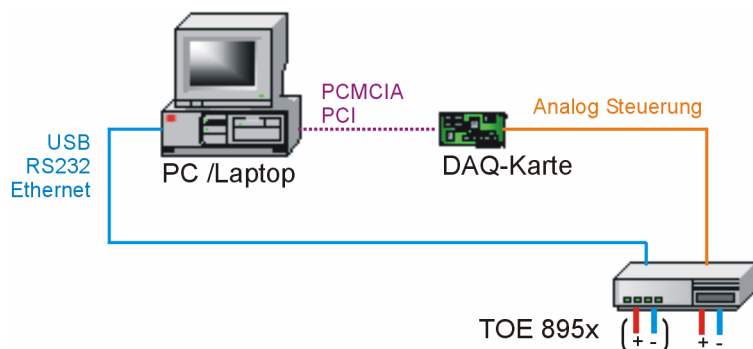


Fig. 7: Other connection possibility compact mains appliance

Check the settings of the serial interface in the device and you put this according to the device description on the following values:

Baud rate 9600
 data bits 8, no Parity bit
 stop bits 1
 protocol Xon/Xoff

Connecting the Power Supplies of the TOE 8840-and TOE 8850 series

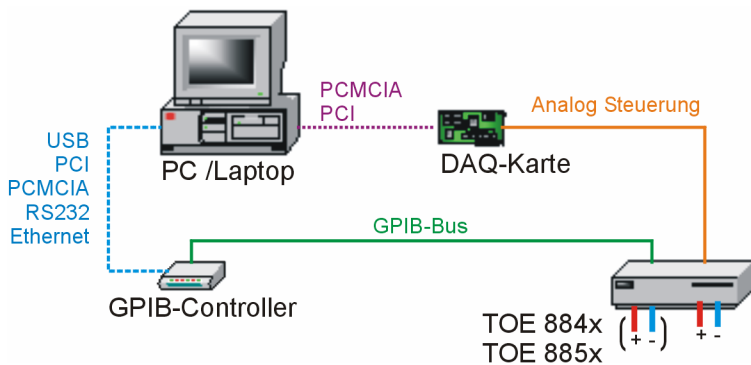


Fig. 8: Connection possibility standard mains appliance

The analogous tax signal is given by the PC about the DAQ Card.

About the GPIB controller (USB, PCI, PCMCIA, RS232, Ethernet) provided that available, the commands can be transferred. The commands bring the mains appliance in the right working condition, as for example standby-or execute mode. Check the settings of the interface in the device according to the device description and make sure that the coach addresses were unambiguously awarded.

According to model row the standard mains appliance disposes of one or two exits. At both exits two different curves can be given at the same time.

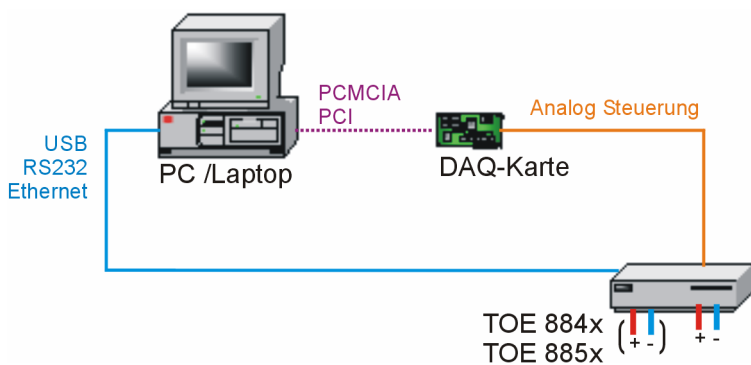


Fig. 9: Other connection possibility standard mains appliance

Check the settings of the serial interface in the device and you put this according to the device description on the following values:

Baud rate 9600
 data bits 8, no Parity bit
 stop bits 1
 protocol Xon/Xoff

Connecting the Power Supplies of the TOE 8870 series

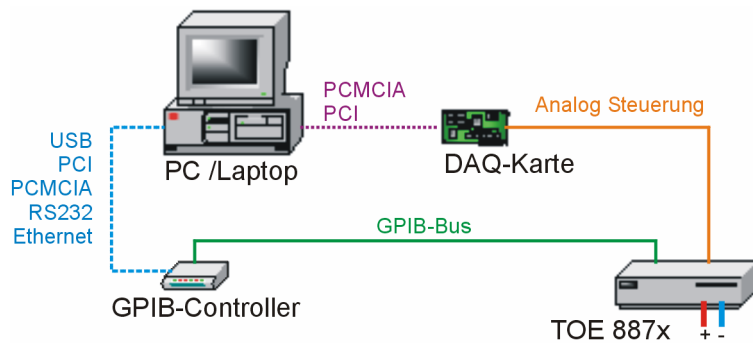


Fig. 10: Connection possibility achievement mains appliance

The analogous tax signal is given by the PC about the DAQ Card.

If about USB, PCI, PCMCIA, RS232 or Ethernet a GPIB controller is connected, the commands can be transferred. The commands bring the compact mains appliance in the right working condition, as for example standby-or execute mode. Check the settings of the interface in the device according to the device description and make sure that the coach addresses were unambiguously awarded.

An exit exists here.

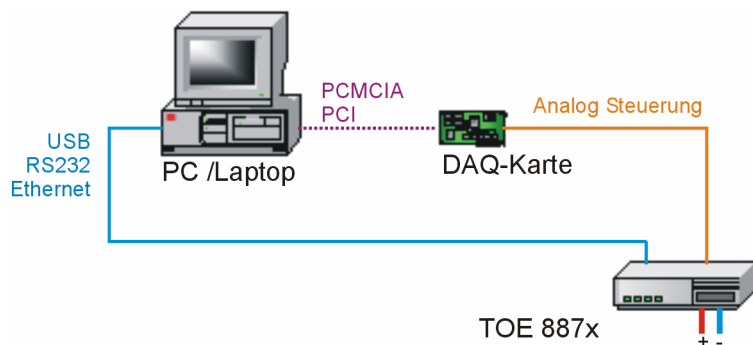


Fig. 11: Other connection possibility achievement mains appliance

Check the settings of the serial interface in the device and you put this according to the device description on the following values:

Baud rate 9600
 data bits 8, no Parity bit
 stop bits 1
 protocol Xon/Xoff

Connecting the Four-Quadrant Amplifier TOE 7610

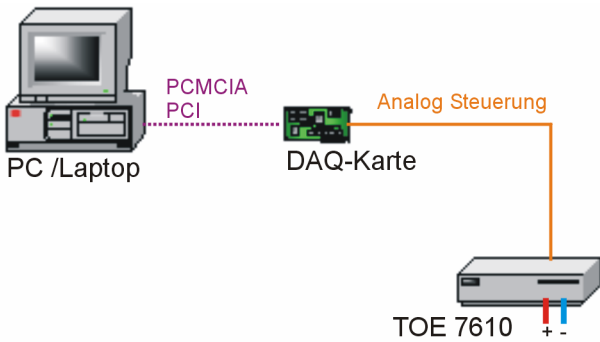


Fig. 12: Connection possibility 4 quadrant amplifier

The analogous tax signal is given by the PC about the DAQ Card.

The device settings can be carried out only directly in the device.

An exit exists.

Connecting the Arbitrary Power Supplies of the TOE 88x5 series

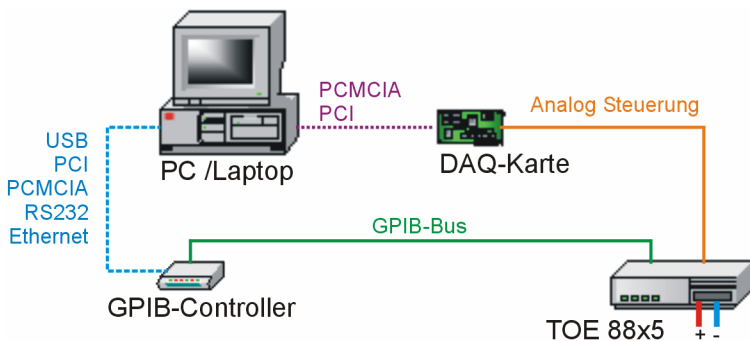


Fig. 13: Connection possibility Arbitrary power generator

The production of the arbitrary signal can occur from the Arbitrary power supply as well as from the DAQ Card.

If about USB, PCI, PCMCIA, RS232 or Ethernet a GPIB controller is connected, generator can become remote control to the power. Check the settings of the interface in the device according to the device description and make sure that the coach addresses were unambiguously awarded.

Connecting the Arbitrary Power Supplies for Voltage Noise Simulation

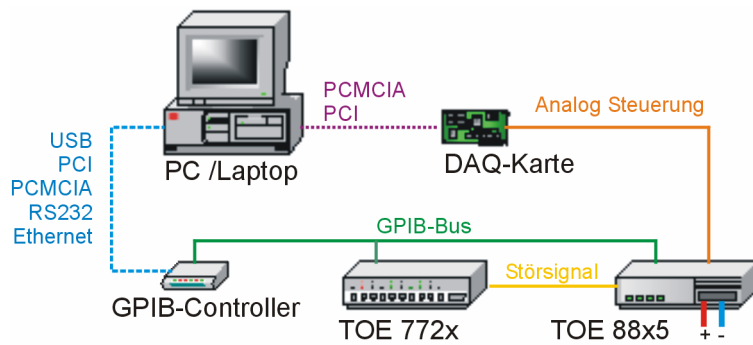


Fig. 14: Connection possibility Arbitrary power generator for the sturgeon tension simulation

Should power generator a sturgeon tension simulation be carried out with the Arbitrary, a frequency generator is used as a signal spring and is connected to the BNC connector (optionally) in the Arbitrary power supply TOE 88x5.

Licence

Universal

The licence regulations of this software contain a device dependant license file. So that the program can communicate with the connected devices, must exist to the suitable license file in the program directory of ArbNet. You recognise these files by the ending .LIC and the speaking file name, from device name and standard number.

In the device overview it is indicated with the device information with whether a software license exists.

The license files are included on the ArbNet CD and are copied by the installation automatically in the program directory.

If is with the device delivery no license code provided for your device, you get in contact please with your supplier. Inform, besides, please of the device type and of the standard number of the device to be licensed. Then they immediately receive the license code, if he was acquired with.

You find standard number and type of the device either at the device back or in the software under the menu point *extra device overview*, while you click there the device name. See chapter Devices.

To the control of the licences go in the menu *File* on the entry *licences*.

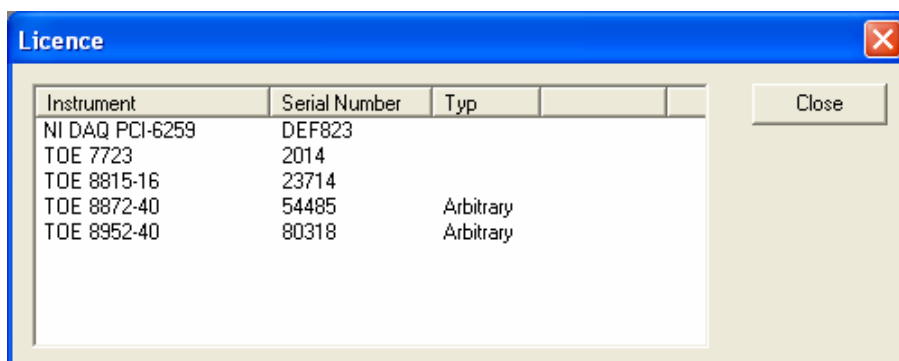


Fig. 15: Dialog box licence

In the dialog box it is indicated them a list with found licenses. Beside the device and the serial number the license type is important for the device series TOE 8870 and TOE 8950. By these devices the "Arbitrary" is optionally available and must be acquired as a suitable hardware and software option.

The Program ArbNet

To start of the ArbNet software you click in Windows toolbar *on start*, then you select *All Programs -> TOELLNER ArbNet* and click *on ArbNet*.

The program starts and now looks for connected devices. This can take up some time. Condition for the device search is that the suitable drivers were correctly installed and the devices are properly connected and are switched on. A search to the serial interfaces COM1 to COM9 follows, if these exist. If the ArbNet software „ with DAQ cards “ has been installed, it is also searched for the devices "Dev1" to "Dev9". The recognized devices become listed in the software *under extra – device overview* with details.

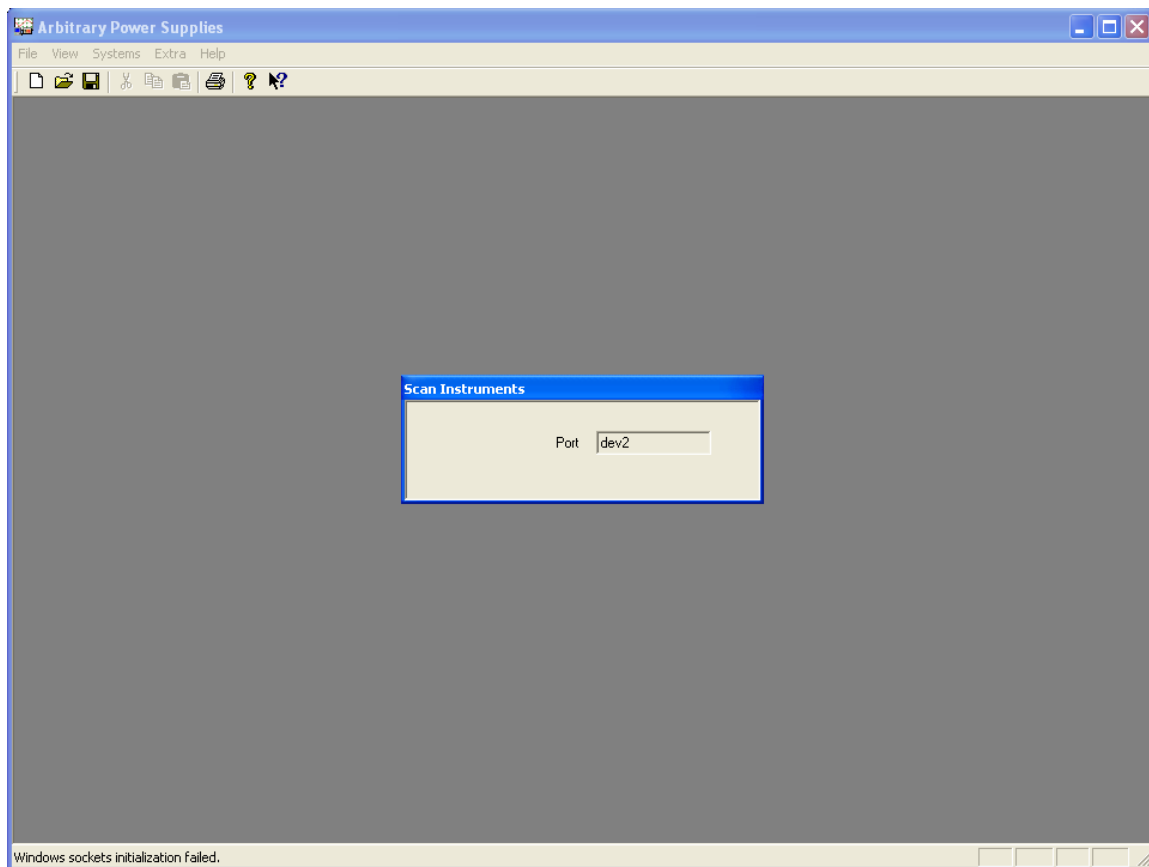


Fig. 16: Start with active device search

After the searching of the interfaces the choice box appears for new files. ArbNet makes a distinction between three kinds of files, the real curve files, the macro files and the trigger files. In the curve file the voltage and current curve is stored. For extensive tests several curve files or pulse files can be lined up in the macro file to a linear result. With the trigger file are put together in a field curve files which are selected by an unequivocal number at the digital input of a DAQ-Card.

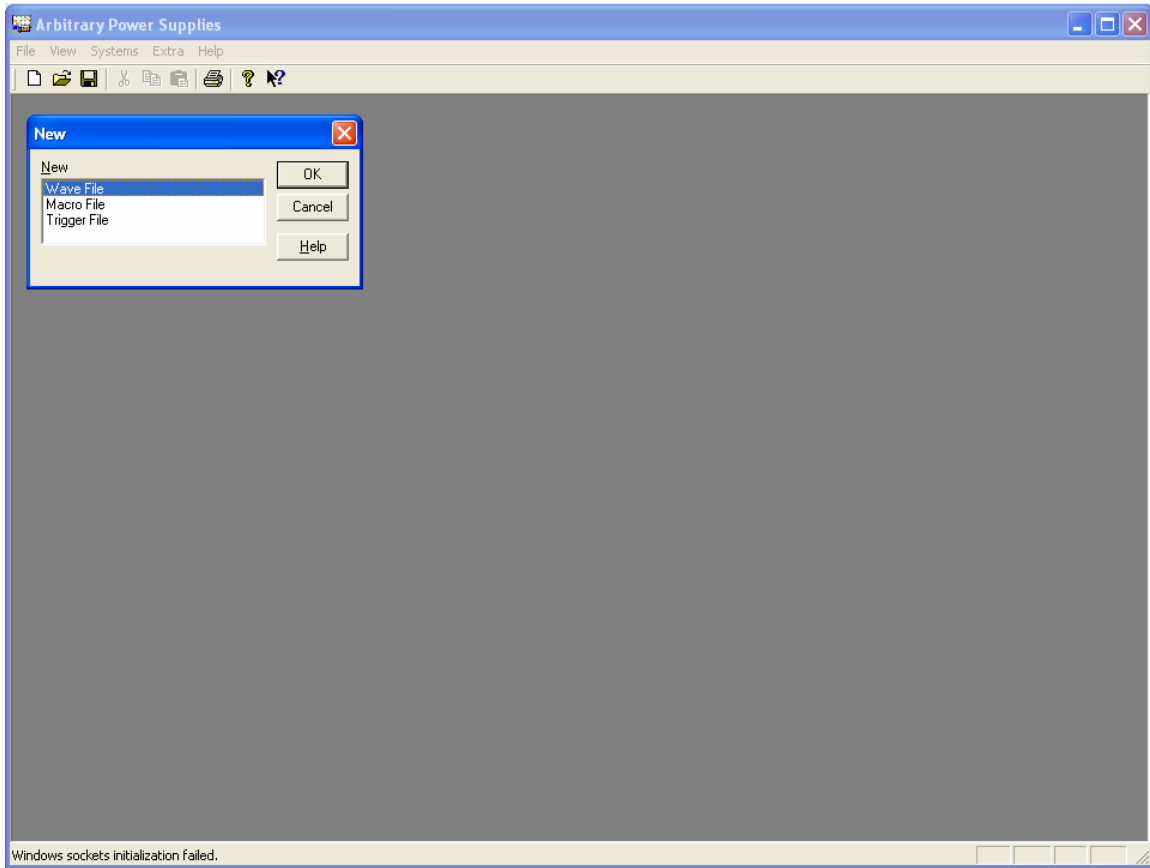


Fig. 17: Choice curves or Macro file

If you want to provide no new file, click in the choice box *on cessation*. Then you can open *with file* open an available file.

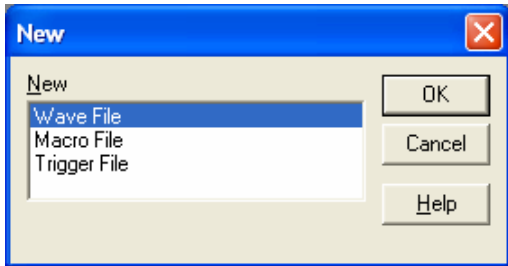


Fig. 18: Choice file type

Wave File

Mark *Wave File* and click *OK*.

You have decided a new wave file to provide and the type "wave file" elective, then two windows appear for this file. One for the numerical input of numerical values in tabular representation and second for the graphic input of a curve to the co-ordinate system. Now the appearance of these windows can vary, because the program makes a distinction between voltage/current diagram and one or multiple voltage diagrams. In most cases the voltage/current diagram is used. Therefore it must be configured in the menu point *of extra – options*.

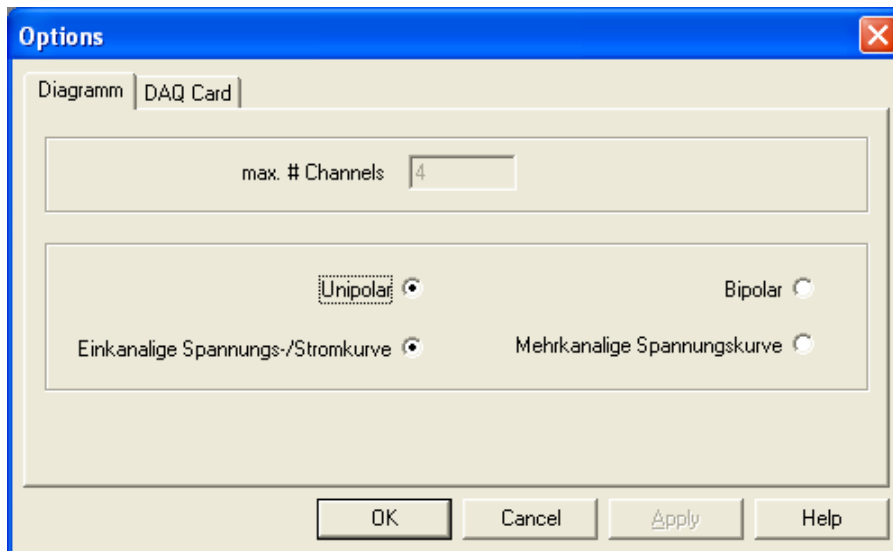


Fig. 19: Dialog box options with diagram settings

Select "unipolar" and „single output of voltage and current curve “. The choice "bipolar" (also negative voltage) does only sense if you use a 4 quadrant amplifier of the TOELLNER 7610 series. You finish the dialog box with OK and you open a new curve file.

Now both windows for this file should look as illustrated.

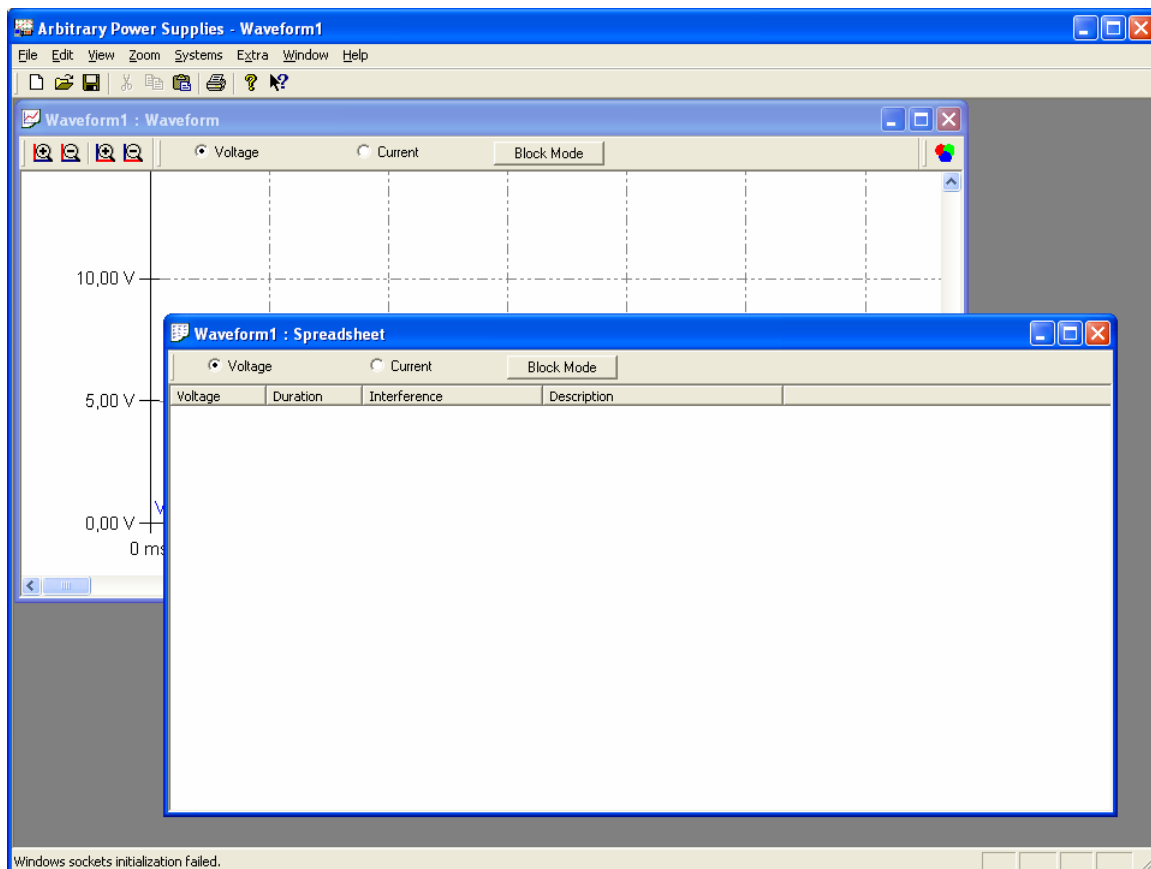


Fig. 20: Window of the voltage and current diagram

The general construction of the curves is regardless of the curve kind. The curve exists of points which are just connected by one. This is also called base line. In the easiest case the voltage or current curve exists of several base lines one after the other. You can define therefore very fast curves which are provided with linear increases and steady values. The properties of every single base line can be changed afterwards and other properties be assigned. Thus you can superimpose to every base line, in addition, special curves, in particular sine oscillation, rectangles and triangular signal forms as well as charging or discharging.

Input of waves in a diagram window

To the input of the wave in the coordinate system select the window *diagram*, while you click it directly in the frame area or in the menu *Window the Waveform 1:Waveform* select.

In the window frame the file name is also included, this is for a not yet stored file „Waveform 1“ and can be changed.

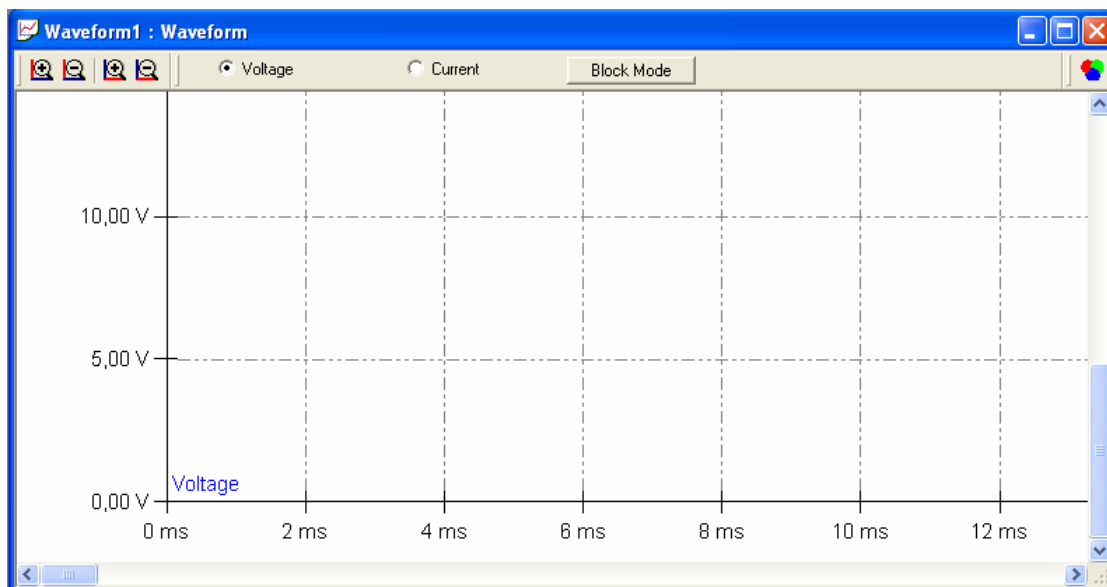


Fig. 21: Input in a coordinate system

In the upper area of the window you see a strip with different buttons. Completely on the left, four icons to the adjusting of the co-ordinate grid, in the middle the choice of the input and completely on the right you can change the color of the curve. In the voltage and current diagram you can switch over between the input of the voltage curve, the current curve and the block mode. Of the block mode TOE 8870 and TOE 8950 with the optional arbitrary function is supported only by the device series.

Setting of the coordinate grid



Fig. 22: Two zoom functions the voltage and the time axis

In the symbolic strip you are able to do the magnifying glasses for the zoom function use. The magnifying glass + and – with the vertical red marking increase or reduce the

amplitude graduation in volt. The magnifying glasses with the horizontal red marking increase or reduce the time graduation in seconds.

However, the amplitude graduation for the voltage can be also changed over the keyboard with *Alt +* and *Alt -*. The time graduation can be adapted *with Ctrl +* and *Ctrl -*.

Besides, it is always increased about 25% or is reduced. + and – keys must be used by the number block.

Graphic input of the voltage

You have selected in the window strip "voltage" with the mouse, this is indicated by the point on the left beside "voltage", then you are able to now can give the voltage curve. Put with the left mouse key the points in the diagram from the left to the right and your voltage curve originates by itself.

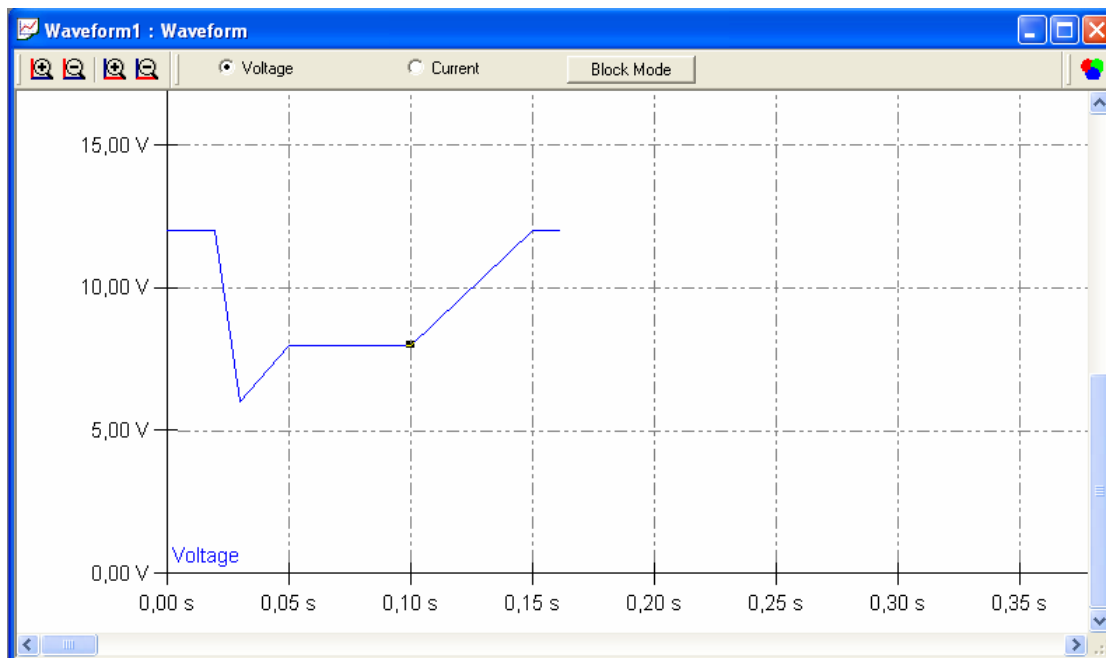


Fig. 23: Graphic voltage input

If you liked to adapt the values or properties of a base line, then do a double click on the base line and a suitable dialog box is opened. Now you can give the exact values.

Graphic input of the current

Select in the window strip "current". Now the point is to be seen on the left beside "current". Now you can give the current curve with the mouse.

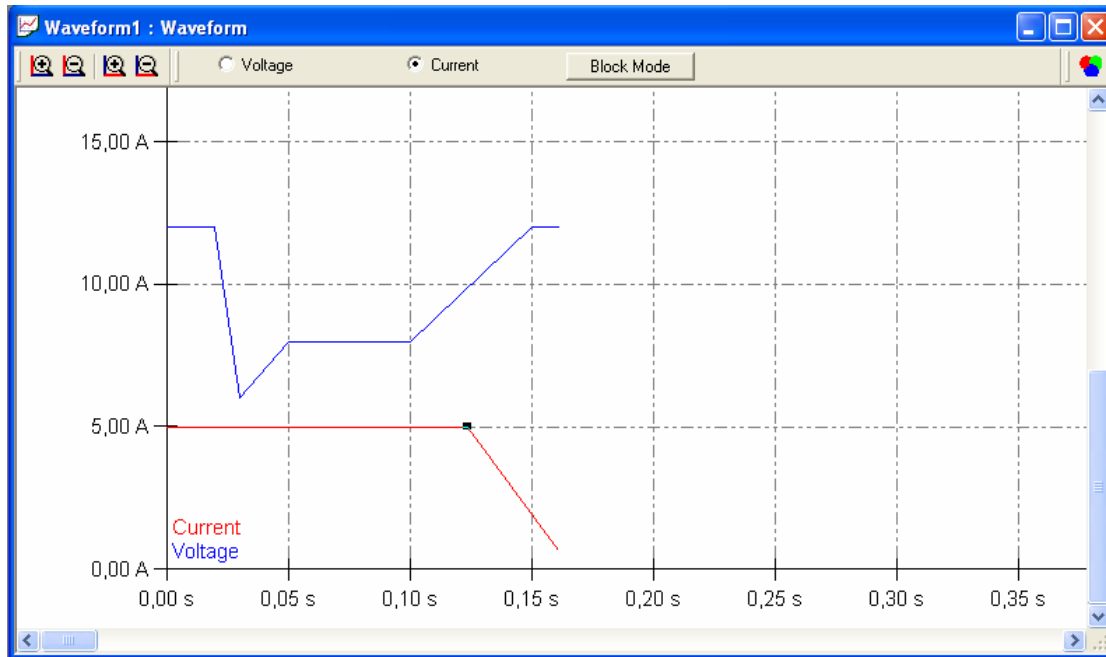


Fig. 24: Graphic current input

Often the current curve will be steady and by a horizontal line shown. Any current curves can be also given, you mark in addition with the left mouse key the suitable points. The length of the voltage and current curves is automatically adapted to the longer by a horizontal line. Pay attention please to the fact that a double click is possible for the adaptation of the values only with the topically well-chosen voltage or current input. Change moreover please where necessary. The choice voltage input or current input.

Block mode input

Only sense does to the block mode if you use the device series TOE 8950 and TOE 8870 with the arbitrary option. Then, besides, these devices in the system must show the source. Because the possibilities of the block modes are very dependent on devices, read up this in the hardware manual. In general you can give the blocks which are explained by the device several times. The block borders are adapted by the program automatically to the steps, because this is necessary for the device programming.

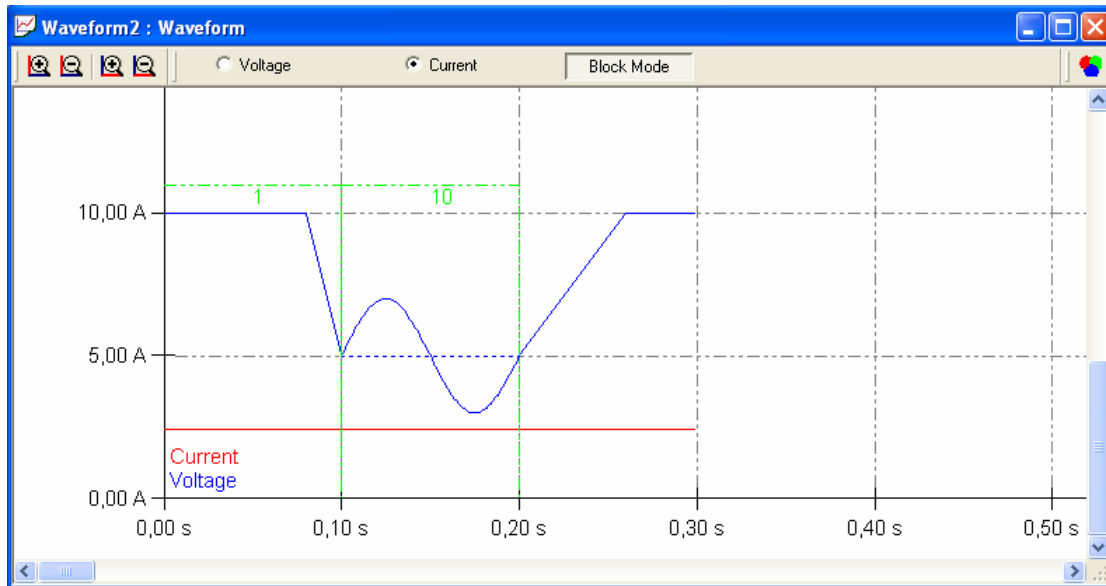


Fig. 25: Graphic block mode representation

In the example two blocks were given and the second block is explained 10 times. By the block mode it is better possibly the memory of the arbitrary devices to be of use.

Change to the color of the curve

With the voltage and current diagram the curves already receive sensible colors. The voltage is blue and the current is shown red. When required you can also change this. Click in addition in the window strip completely on the right on the color symbol red-and-green-blue. The color choice dialog you open maybe already from other programs know.



Fig. 26: Color choice for curves

Select the desired basic color, or define to yourselves own tone. Finish the dialog with *OK* and the color it is taken over for the suitable curve.

Input of waves in the spreadsheet

To the input of the data in the tabular view, you select the window *table*, while you click it directly in the frame area or in the menu *Window the Waveform 1: Spreadsheet* select.

Analogously to the curve view this window also has a window strip and within the scope of the file name with is included. This is with a new and not yet stored file „ curve 1“ and can be changed arbitrarily.

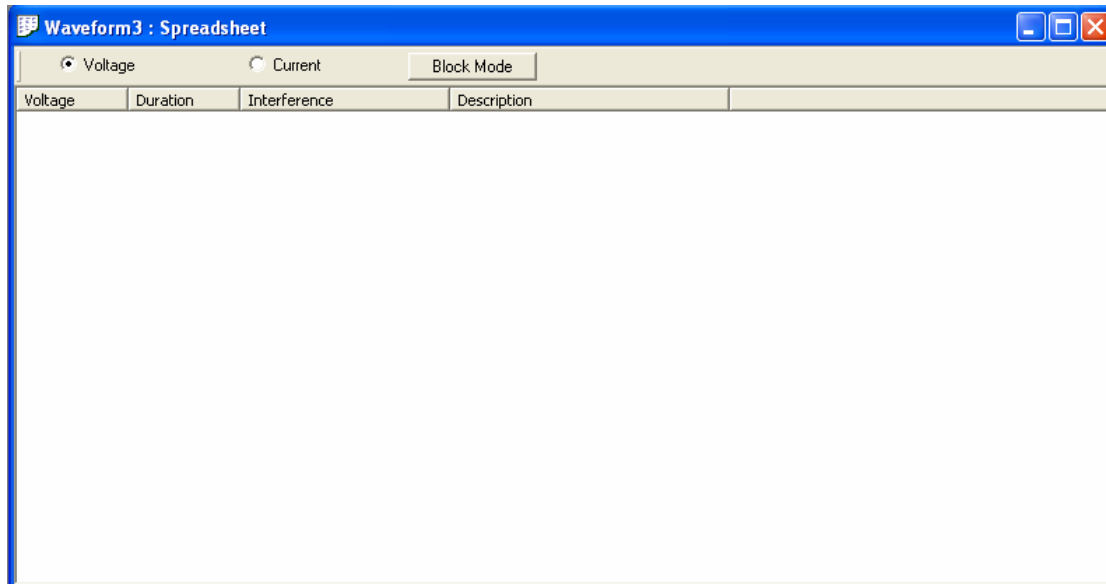


Fig. 27: Input in the tabular view

In the window strip you have to change the possibility between voltage, current and block mode input. For the voltage input you choose with the mouse voltage, this is indicated by the point, and explain a double click directly under the table head in the uppermost line. Now a dialog box is indicated for giving of the data. You give the values of the base line which you already know from the graphic input.

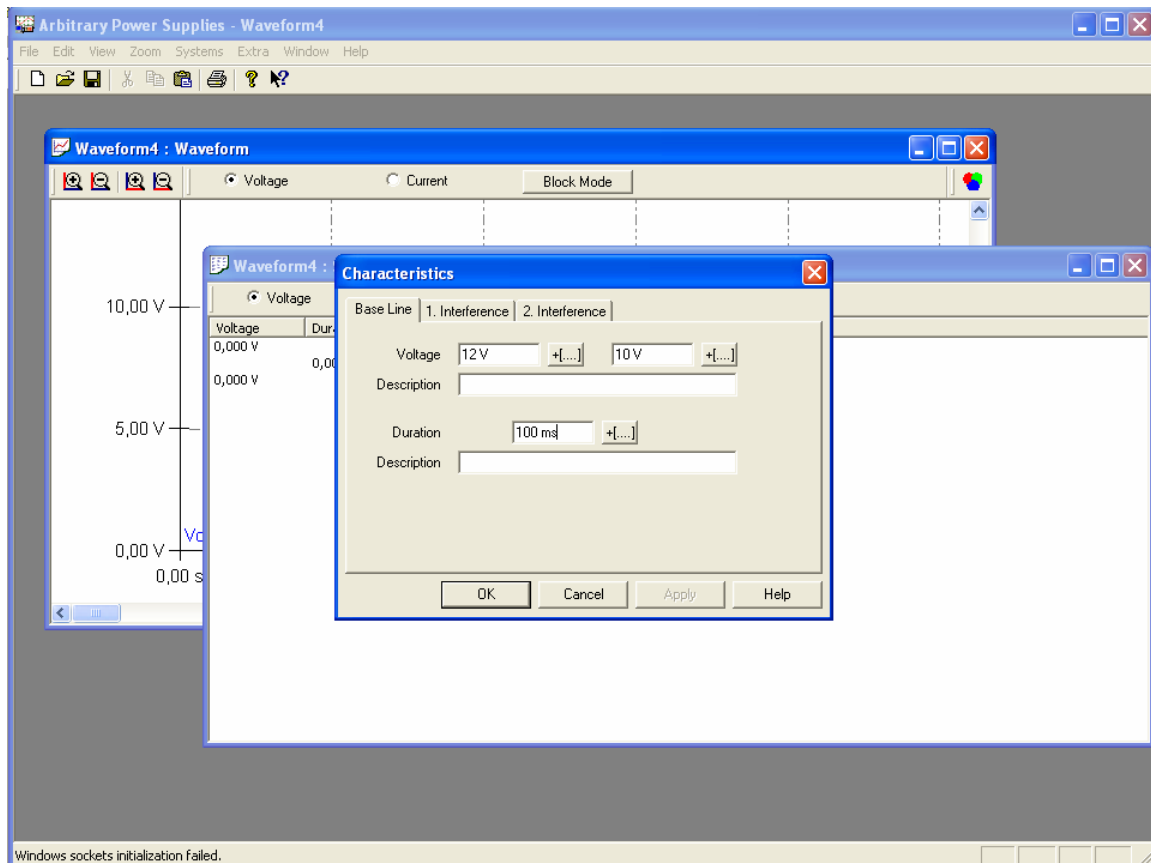


Fig. 28: Input of a base line in the tabular view

You receive this input dialog also with a double click on the base line in the graphic view. The input possibilities are described in the chapter "input correction" in detail. After the input you finish the dialog with the button *OK*. To the input of the next base line you explain a double click in the line below the last table entry. Then you receive the dialog box to the next input. Then the first voltage value is already put, because this is the value of the preceding line. If you liked to correct values, the double click on the suitable line is explained again and the value can be changed in the dialog box.

The input of the current values is analogous to the voltage input, merely the name of the fields changes.

Correction of the input

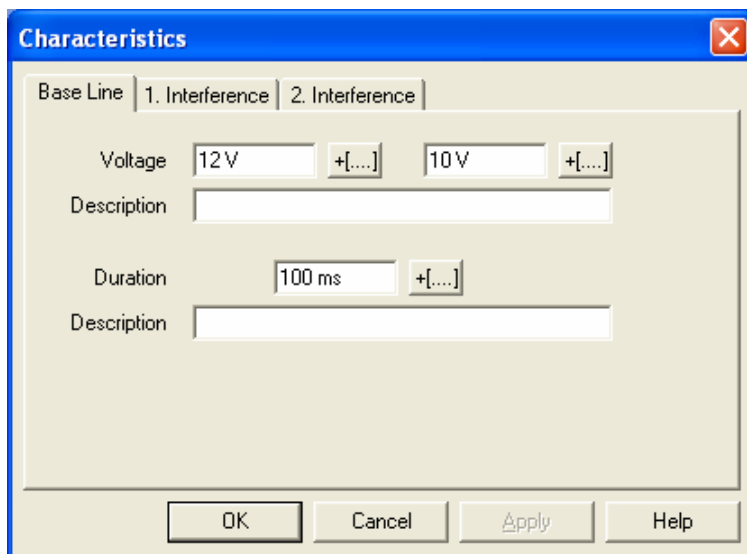


Fig. 29: Input correction base line

By a double click on the base line in the graphic view or on the suitable line in the tabular view, you receive the dialog box with the properties to the base line, in this you can change the data. All numerical values are given with the suitable unity. With the input it can be likewise given with. As a standard unity volt v, ampere a or seconds s is accepted. It will also correspond millivolt mv, milliamps ma and milliseconds ms in him to fields accepted. In addition, it is possible at this point to assign a comment to the voltage value or current value and to the current value. These comments become visible in the tabular listing.

The base line is fixed by two values and the duration. If one chooses two same voltage values, one receives a horizontal line, the first value is smaller than the second, one gets a rising ramp and the first value is bigger than the second, a sloping curve arises.

To receive a vertical increase flank and waste flank, one chooses with the duration 0 seconds the time for the increase flank and waste flank then is depending on the dynamism of the mains appliance to be headed or the arbitrary power generator or a 4 quadrant amplifier.

You can remove a base line while you select this with click. It receives a small mark and you extinguish *extinguishing* then *with the delete key* or in the Menu *treatment* select around this part to extinguish. In the tabular view you select the line with a click and then operate *the delete key*.

Interference

With the interference it concerns supplements to the base line which these change. This counts for voltage as well as current curves, even if the following description refers to voltage curves. With current curves the name of voltage changes in current and accordingly the unity ampere A or milliamps ma must be used. Thus can become from the base line, for example, a sine oscillation or another signal curve. You reach to the superimposition in the dialog box with the properties of the base line by a double click the base line or the suitable table line. Choose now *the tab 1. Superimposition*. Here is able

to superimpose the DC signal which is shown with the base line, a sine, rectangle, or triangular signal are overlaid or with the charging / discharging the curve of a charging or discharging of a capacitor are generated. You remove the superimposition again, while you select the button *none*.

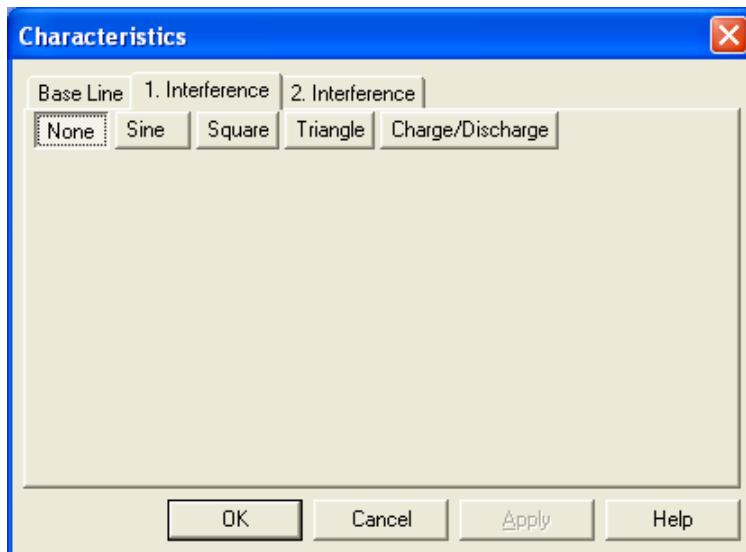


Fig. 30: Input no interference

Input of a sine interference

Press the button *sine* and you get the input mask for the sine oscillation to be overlaid. At first you give the frequency of the swinging, for this two input fields are available to you. The first field is the start frequency and the second the final frequency. For a sine with staying the same frequency both values must be identical. With different frequency it is adapted linearly to the duration of the base line. This corresponds to a part from the sweep function of function generators.

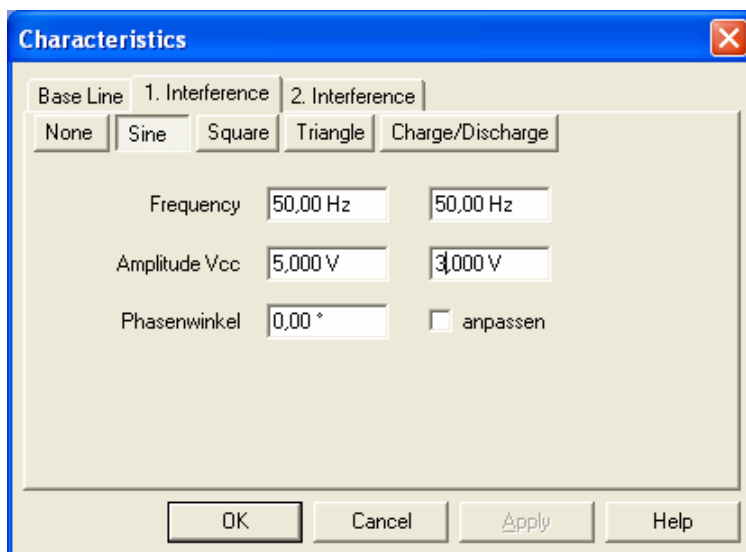


Fig. 31: Input sine interference

Analogously it behaves with the voltage input for the amplitude. Also this can change for the duration of the base line linearly.

In the example a frequency of 50 hertz, a beginning amplitude is given by $5.0 V_{CC}$ and a final amplitude of $3.0 V_{CC}$, this proves a linearly subdued oscillation as a superimposition.

With phase corner if the start phase can be defined. If becomes a phase corner of 180° will give the sine with the negative half wave begun. You can let the phase corner also to the phase preceding adapt base line, in addition you select the controlling small box "adapt" with the phase corner. This makes sense if the oscillation to itself about several base lines spread. Below example the sine ends with a phase corner of approx. 270° . Then by the phase adaptation of the next base line with sine superimposition this begins exactly with this value. Therefore there originates a harmonious continuation of the curve, even if the base line does not agree at this point exactly with the frequency curve.

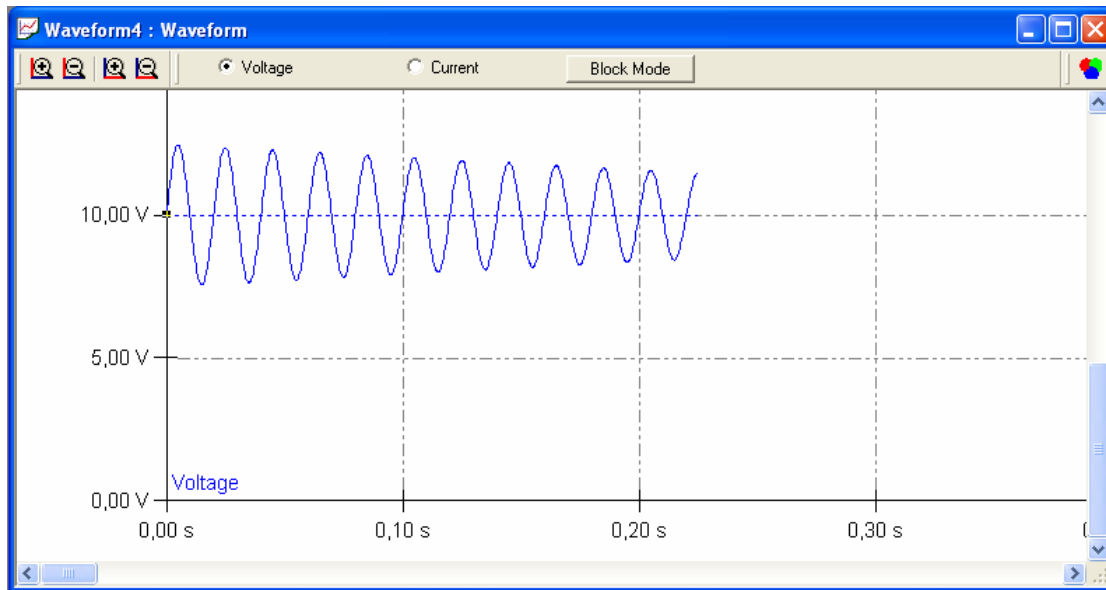


Fig. 32: Curve with subdued sine interference

You can still add a 2-nd sine superimposition additive to this sine to generate, for example, a rushing. For it you choose *the tab 2. Superimposition.* from.

Input triangle interference

The input of a triangle interference occurs in the same way like the input of the sine superimposition. The difference lies only in the curve form, from the sine oscillation become triangular signal forms.

Input square interference

Of the base line a square can be also overlaid. Therefore you can generate any pulse signal. With this superimposition the impulse break relation can be also given and be changed linearly for the duration of the base line.

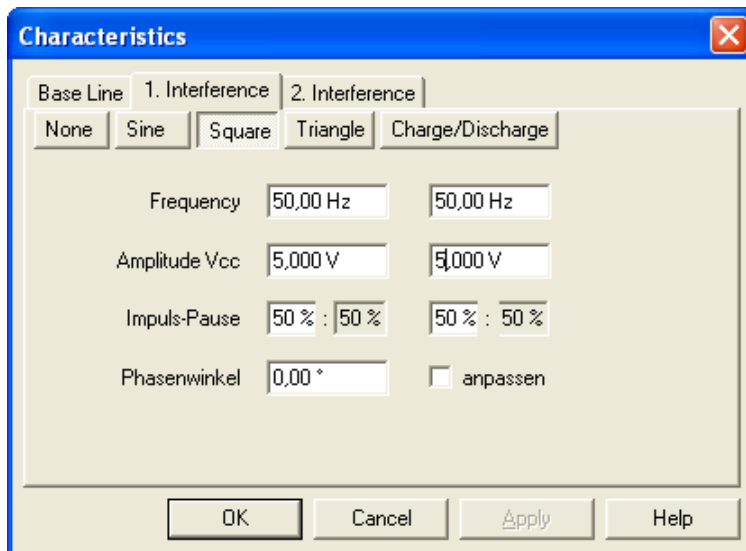


Fig. 33: Input rectangle superimposition

Because the duration of the oscillation is already given by the frequency, the impulse break relation is given in terms of percentage. Besides, the inputs give the proportional one of the impulse, then the break is automatically calculated.

Input charge and discharge curves

Of the base line a charge or discharge can be also overlaid – like a capacitor charge /- discharge. With the base line you determine the voltage difference and the duration of the process. In the dialog of the superimposition charge / discharge if the voltage difference and the duration is indicated them, now you give with the unloading the duration after which the voltage to 10% of value should have reached. If you leave this input field, the duration is calculated to them for 90% and the whole duration (100%). Note that the values stand in the right relation, because the process is broken off after the given duration. With a loading you give the value of 90%.

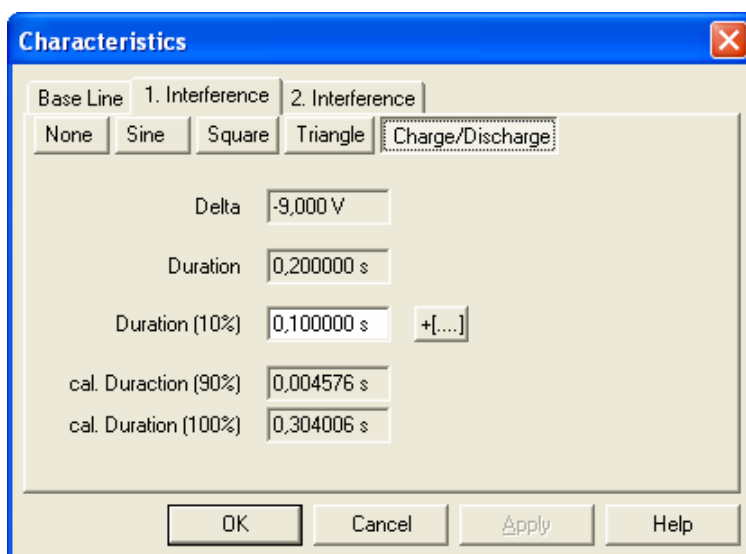


Fig. 34: Dialog charge / discharge

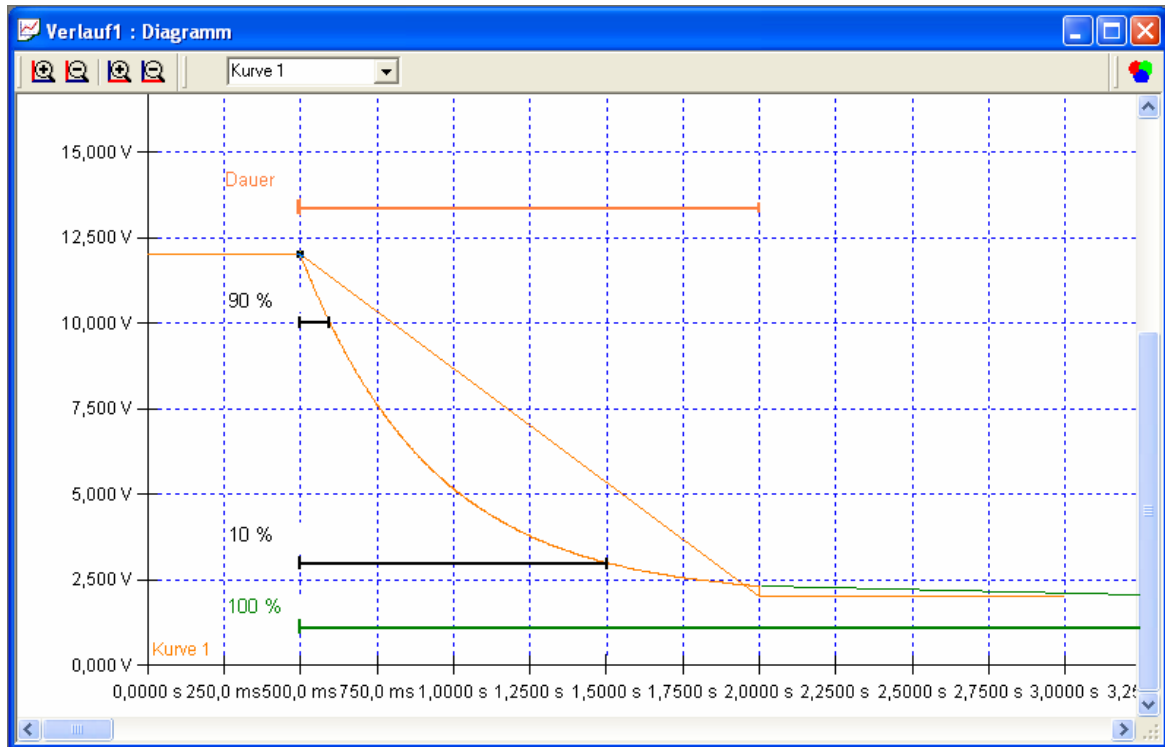


Fig. 35: Graphic arts charging and discharging

Macro File

The macro files can be used for different areas. A sequential one each other it is general the macro file line up from existing ArbNet files, excluded of the macro files. In the macro file only files can be used by the same type, e.g., settings of the superimposition voltage or arbitrary curves. The Macro file can be used for files of the "arbitrary function", the "pulse generator" or the superimposition voltage simulation.

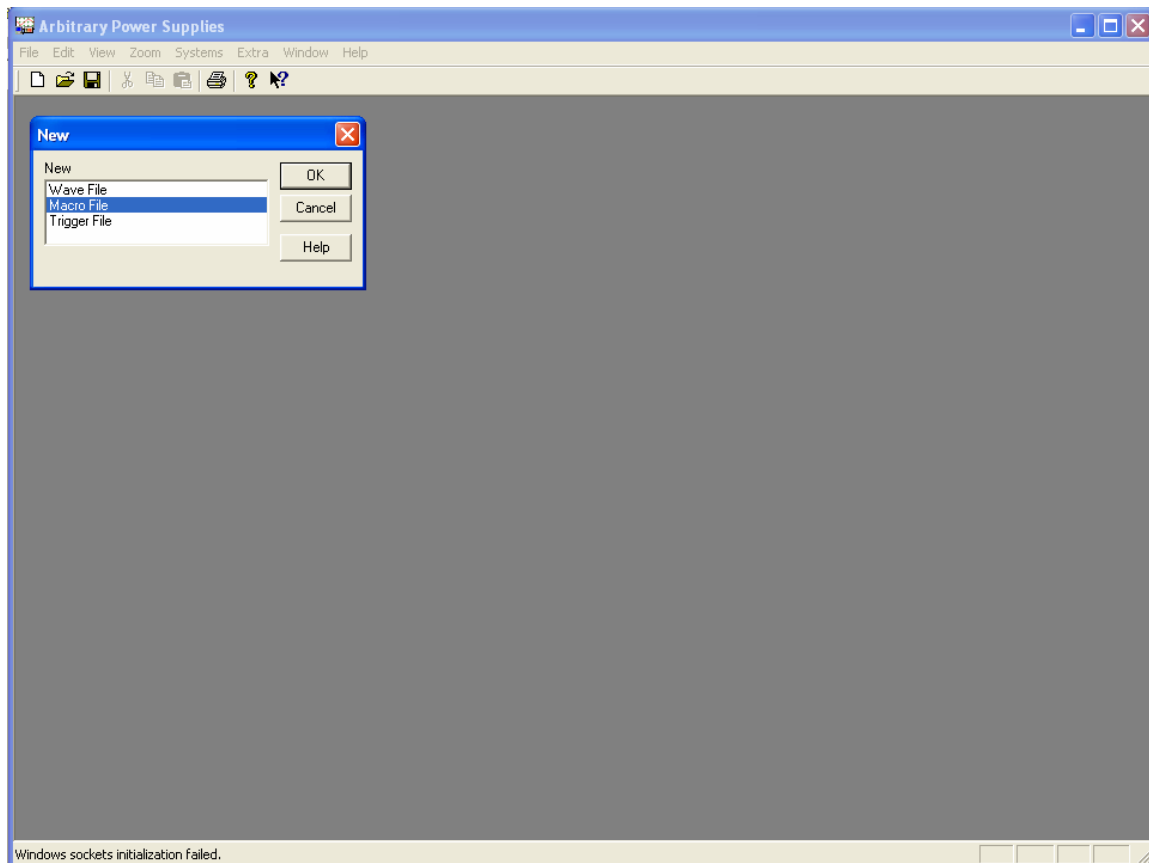


Fig. 36: Choice Macro file

To the input of a macro file you select at this point „ macro file “ and click *OK*. A window with a tabular view is generated illustrated how in the following. At first this file is still empty.

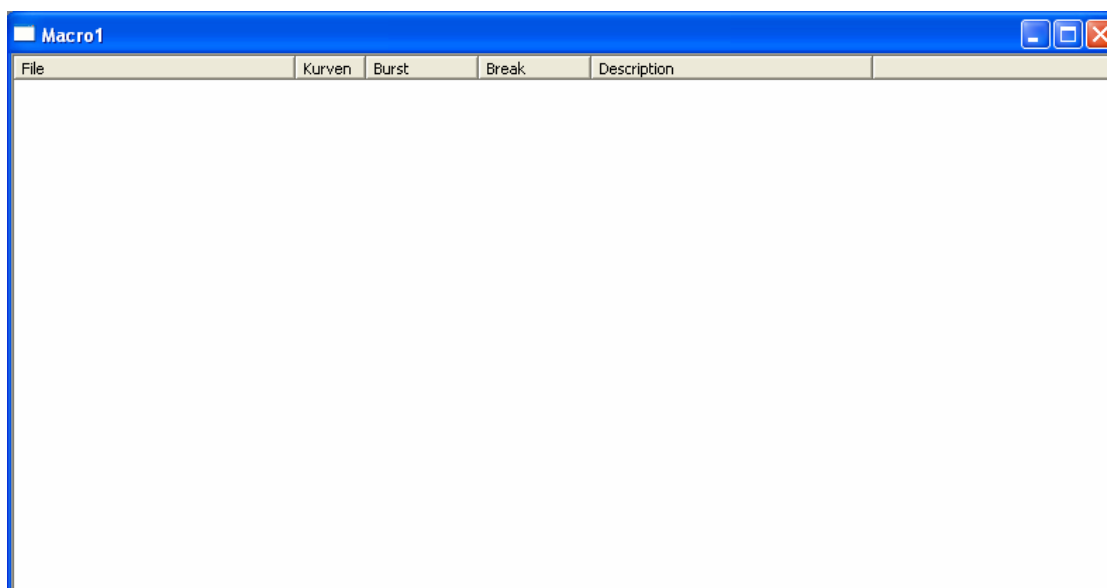


Fig. 37: New Macro file

Carry out now a double click on the uppermost line, directly under the table head. Now it opens to itself a dialog box for selecting files to the macro. For corrections you likewise click with a double click on the suitable line.

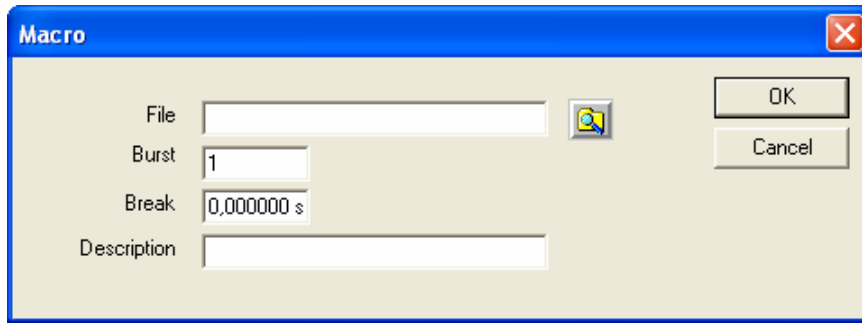


Fig. 38: Input mask for macro

In the field File you put down the entire file name with path of an available file or you use the magnifying glass function and search the file about file dialog. Burst determines the number of the flows of the single file and the break occurs before the next file. Here, in addition, you can also put down a remark to the curve file.

File	Kurven	Burst	Break	Description
C:\ArbNet Kurven\Cranking.and	0	1	0.000000 s	
C:\ArbNet Kurven\Import1.and	0	1	0.000000 s	

Fig. 39: Listing of several wave files

In the above list you see two curve files which will run through in each case once.

Trigger File

If you use in the arbitrary function a DAQ card to generate the curve, then the trigger file can be interesting. Fancy the trigger file as a field with 256 entries. About the digital input of the DAQ card you can determine about the suitable bit pattern the choice of the curve. The trigger files can be used only for curves from the area "arbitrary function".

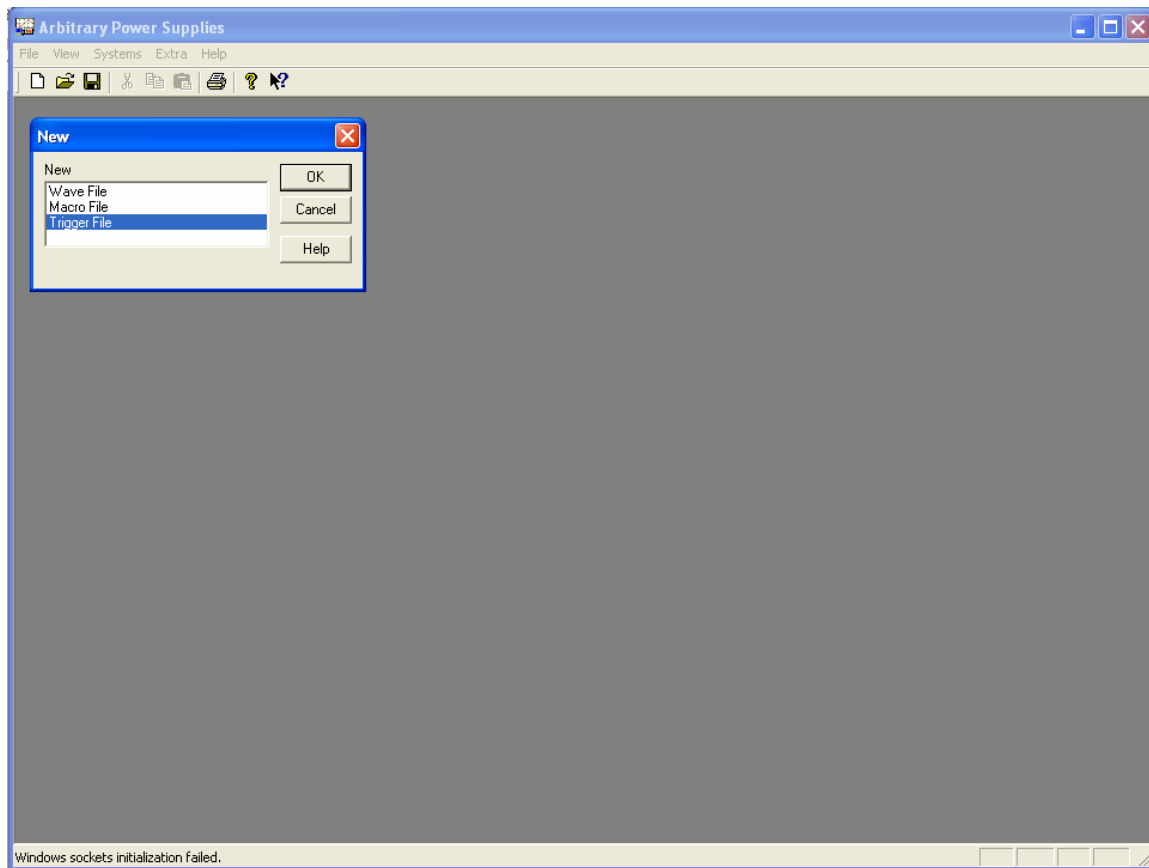


Fig. 40: Choice Trigger file

To the arrangement of a Trigger file you select at this point „ trigger file “ and click *OK*. A window with a tabular view is generated illustrated how in the following. At first this file is still empty.

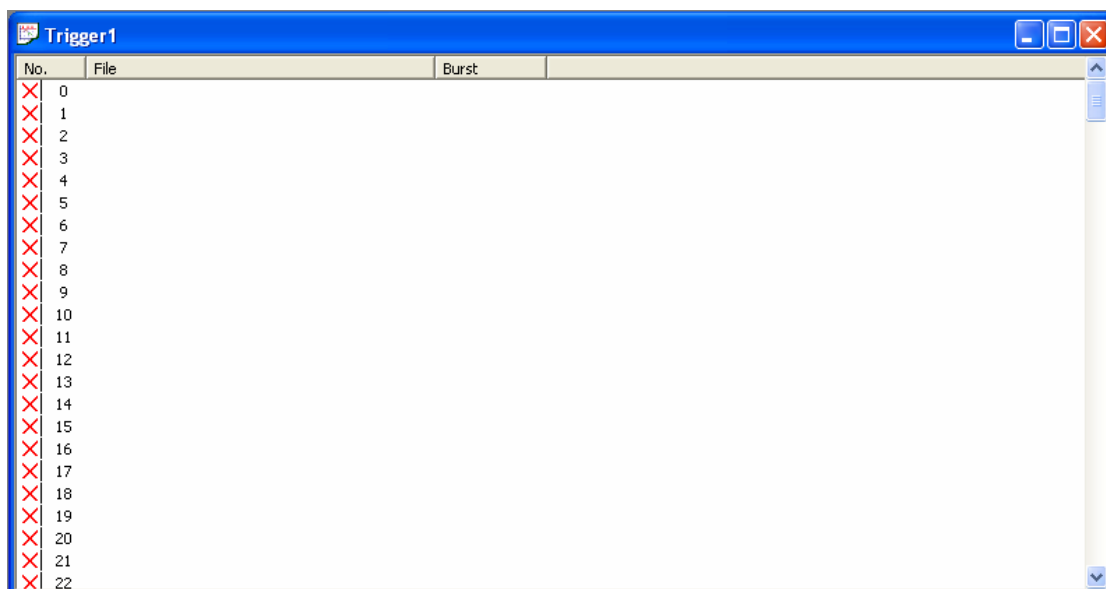


Fig. 41: New Trigger file

Carry out now a double click in the column File in the suitable line, an input area opens for the file name and the magnifying glass symbol with you after the file can look. Confirm

the file name with the key *Return*. Also you proceed in the column *Burst* for the number of the flows.

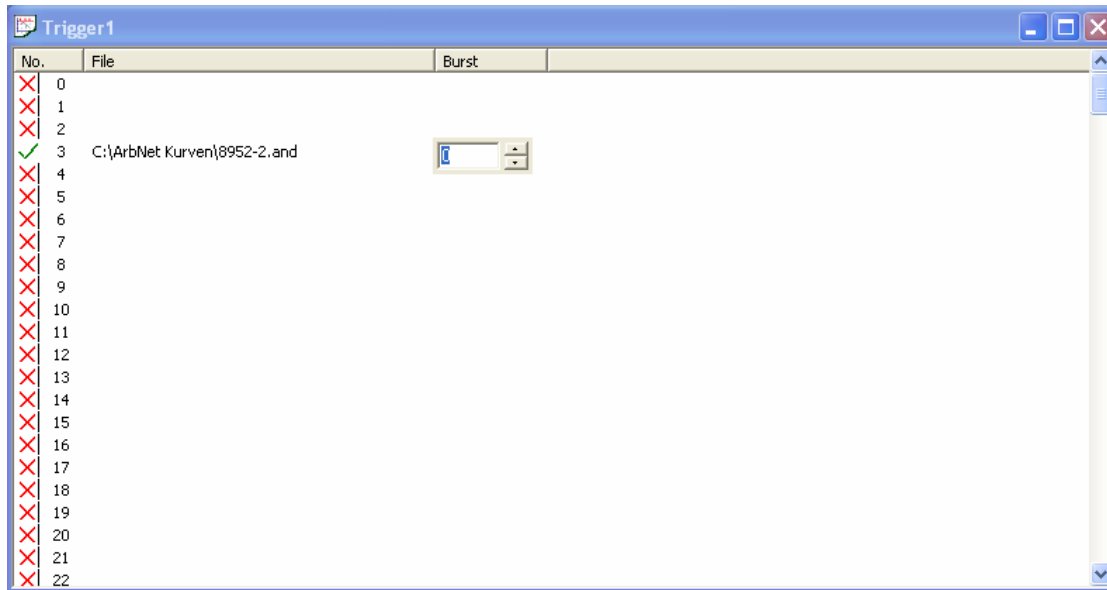


Fig. 42: Input Burst in the Trigger file

Before the number of the entry it is indicated you whether the entry is valid.

Data import from oscilloscopes and files

For the data import of really taped signals you store the data with the help of an oscilloscope in an ASCII file.

Open at first a new curve file and select then in the menu *File* the menu point *Import* and there *text file*. Open an available file in the CSV format.

Condition for reading in of the data is a pure text file which contains the current value, in the second ones the voltage value and optionally in the third column the at most allowed current. If the values exist in this order, no column heading is necessary.

To read in a file with any order, the following headings must be used: Time, voltage, current.

The data import function automatically recognizes whether the decimal values of time, voltage and current contain commas or points. As a separator of the data fissures tabulator, semicolon or commas are permitted. The comma can be used only unambiguously, so either as a decimal separator or as a column mark.

Data takeover of signals in the MCD format (Memory Card drive format)

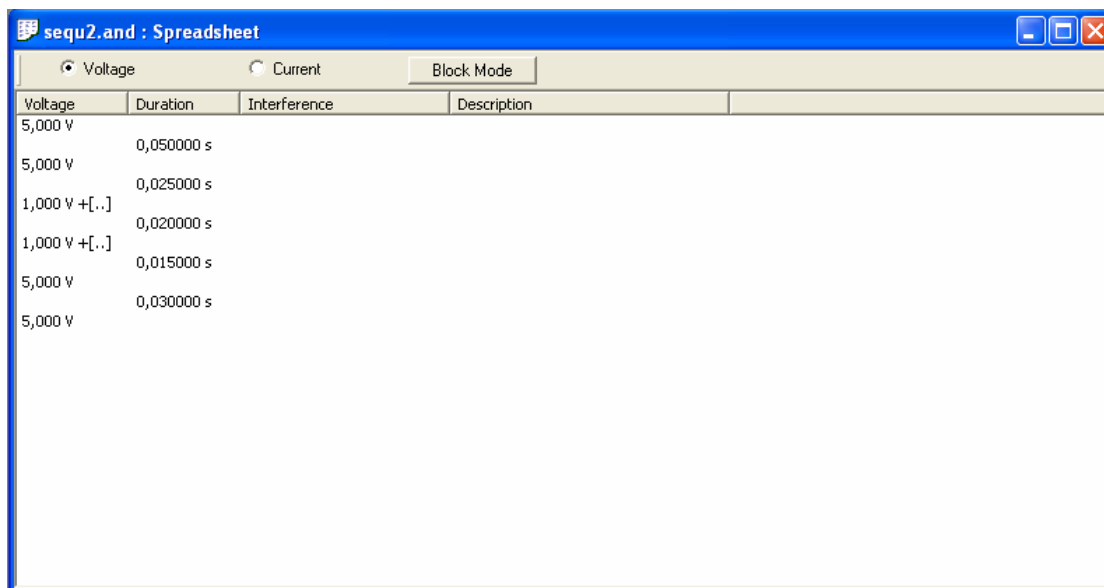
For the data takeover of the signals which were generated with the software of the "Memory card of drive" of the type TOE 9030 you open at first a new curve file. Go then on the menu point *File-> Import* and the choice *MCD file*. Select the file to be imported and click on the button "Opening". Now the file is imported.

Data takeover of devices

If a curve is already stored in an arbitrary power generator, this can be imported in a curve file. Open at first a new curve file. Go then on the menu point *File-> Import* and the choice *of device*. Select from the list the device and the data will transfer.

Sequence input

The sequence function serves for the variable input of voltage or time areas. Signal curves with variable values can be thereby equipped to test thus borders of a connected load automatically. A voltage burglary is able to do it thereby in predeterminable steps variably and successive are simulated rising / sloping. Also, e.g., the duration of a voltage burglary can be formed variably to test the borders of a burglary in the load.



The screenshot shows a window titled "sequ2.and : Spreadsheet" with a "Block Mode" button. The window contains a table with the following data:

Voltage	Duration	Interference	Description
5,000 V	0,050000 s		
5,000 V	0,025000 s		
1,000 V +[...]	0,020000 s		
1,000 V +[...]	0,015000 s		
5,000 V	0,030000 s		
5,000 V			

Fig. 43: Table with sequence

Sequence with variable voltage amplitude

Around the voltage with a variable amplitude to define, click in the graphic or tabular input mask on the area which should be formed variably. The input mask thereby opens for the properties of the base line.

Click behind the input of the voltage on + [...] – field. This value is marked by this default now as variable. If the final value of the area is also to be formed variably, activate also this + [...] – field. Then the input mask changes as follows:

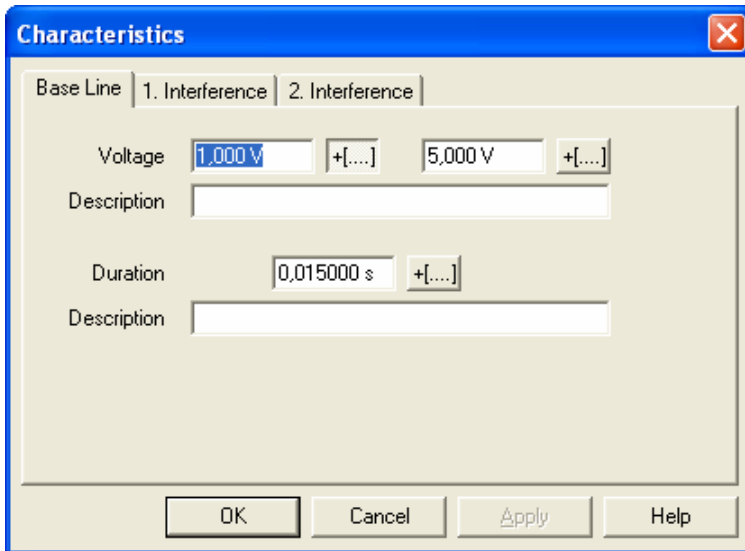


Fig. 44: Variable voltage area

You activate the input of the variable borders, while you do a double click on marked + [...] – fields:

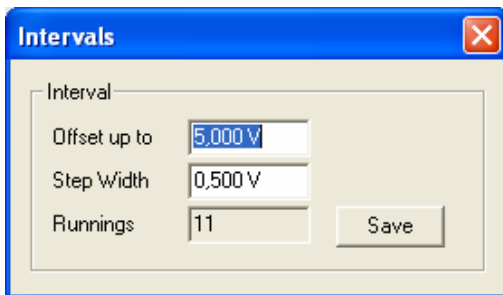


Fig. 45: Intervals

Give the offset one around how much V / mV the voltage should rise / drop up to the final value. A positive value raises the voltage, a negative value decreases the initial value. The step width gives the resolution of the voltage steps. The number of the flows is calculated by clicking *on memories*. Change after ending and before the start of the sequence in the function of *extra intervals*, select there the voltage and the field Interval active.

Several voltage areas can be activated. All well-chosen areas are varied with the same parameters.

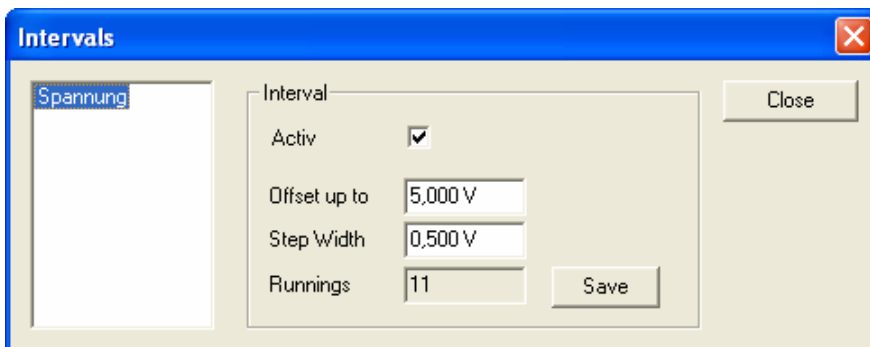


Fig. 46: Intervals overview

Sequence with variable time

To define the time with a variable value you click in the graphic or tabular input mask on the area which should be formed variably. The input mask thereby opens for the values.

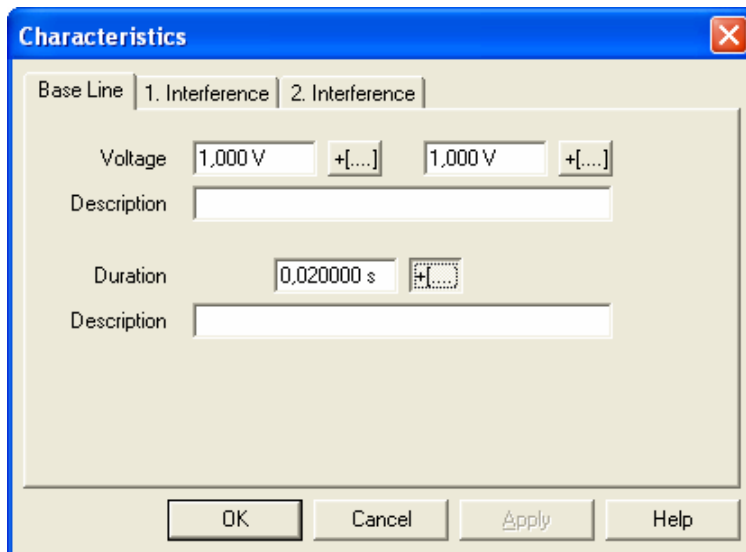


Fig. 47: Sequence with variable time

Click behind the input of the duration on + [...] – button. This value is marked by this default now as variable. You take the input of the variable borders before, while you do a double click on + [...] – button behind the duration.

Give the offset, around how much s / ms the time up to the final value should rise / drop. A positive value raises the duration, a negative value decreases the initial value. The step width gives the resolution of the time steps. The number of the flows is calculated by activation of *the memory button*.

Note that it concerns with the inputs for offset and this no absolute values are.

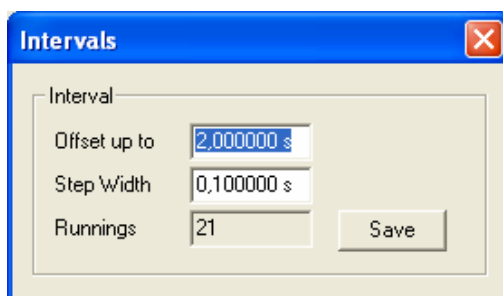


Fig. 48: Time interval

Change after ending and before the start of the sequence in the function of *extra intervals*, select there *the duration* and select the field *Interval active*.

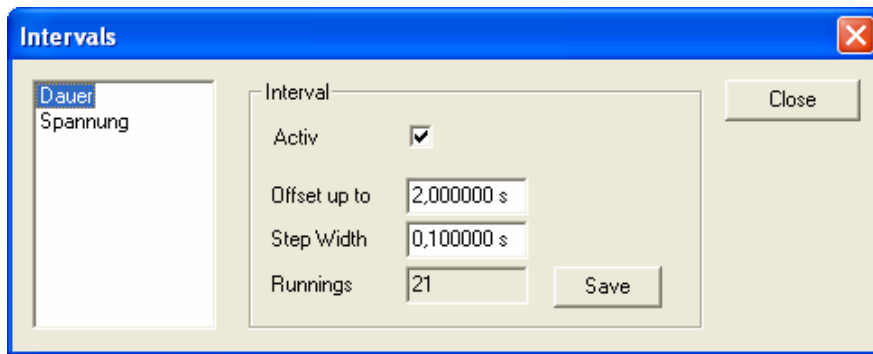


Fig. 49: Interval Overview

Definition of systems

In the menu point *of systems* you can remote the connected devices. Besides, the devices are put in the respective mode of operation, are transferred arbitrary curves, settings in the devices carried out and the remote control as well as remote control is taken over.

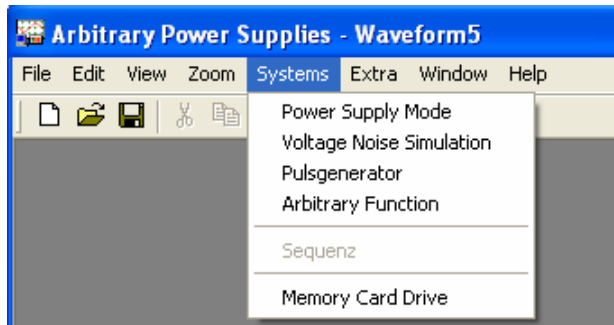


Fig. 50: Menu point Systems

If several devices are connected in a device group, these can be looked as a system and are controllable. A system always exists of an arbitrary source and optionally an amplifier. If the devices of a system are online and licensed, these are configured by the program accordingly and are switched together.

The connecting state is indicated by the connecting symbols online (green) and offline (red) beside the device choice.

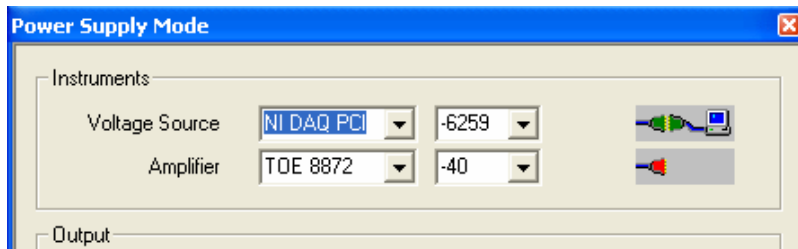


Fig. 51: Connecting symbols on-line and off-line

With the device choice only licensed devices are listed. Besides, is also distinguished between the functions of the devices. If no devices stand for the choice check please the licences under the menu point *File* → *licences*.

With all systems the values always refer to the exit of the system. If a parameter setting of the signals is necessary, this is automatically carried out.

The systems are made up of the areas:

Power supply mode, supply voltage ripple simulation, pulse generator, arbitrary function, sequence and memory card drive.

Power supply mode

Have to do the overall system as a power supply, i.e. as a steady voltage or current source work, choose *systems mains power supply mode*. Select *by devices voltage*

source the device which you would like to use as a master device. Besides, you can use devices of different classes from TOELLNER as a signal source or a DAQ card.

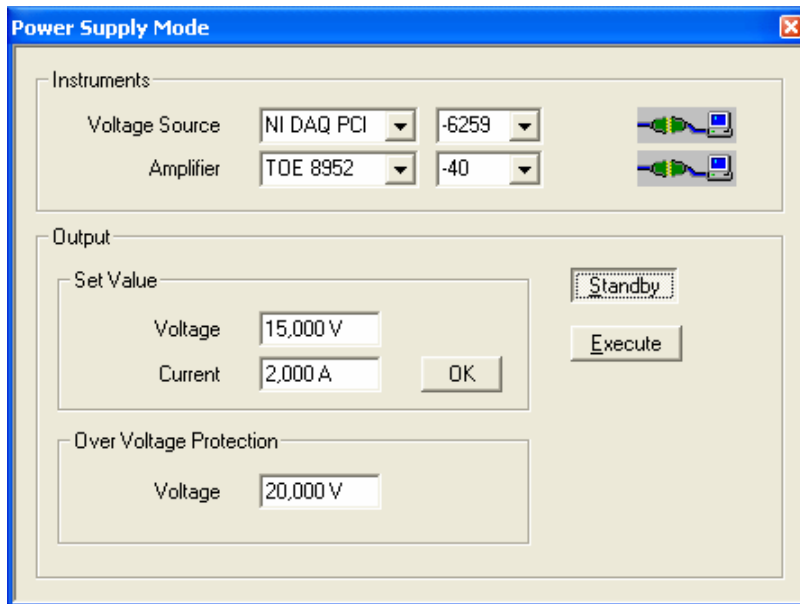


Fig. 52: System mains appliance company

If the voltage source shows the device which should deliver the voltage signal (without connected amplifier in the master), select in the area of *Devices amplifier* the desired voltage giver. As an amplifier "none" is activated.

If the master shows merely the signal-giving device (source) to which a TOELLNER power supply is connected as a voltage and current amplifier or power amplifier, you select *by devices amplifier* the suitable device.

Thereby the software sets parameter values to the monitor voltage on the suitable 0...10V signal which is given then on the analogous controlling input of the device serving as an amplifier.

According to choice of master and slave, if the masks are dynamically built up and permit the input of other edge parameters.

Voltage noise simulation

Have to do of the arbitrary power generator as a voltage noise simulation, choose *systems voltage noise simulation*. This function is used to overlay a superimposition with different frequency, e.g., to a 12V vehicle board net. Besides, power generator a function generator is connected to the arbitrary to the BNC socket. Besides, the power supply gives the voltage level, the frequency generator delivers the ripple signal.

Select *by devices function source* the ripple signal giver as a function source. Besides, you can select alternatively a TOELLNER function generator or an external, not controllable function generator.

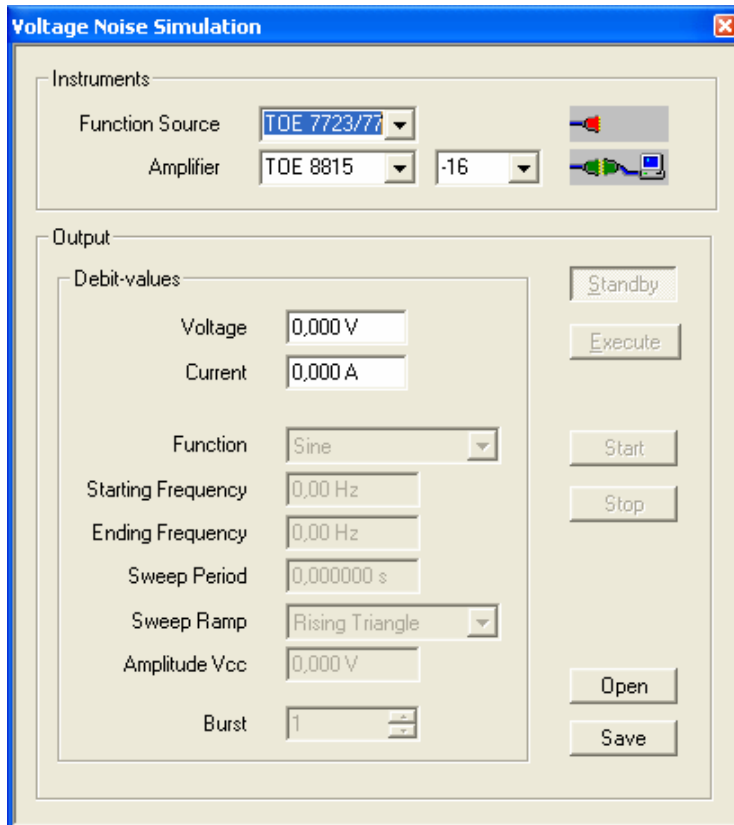


Fig. 53: System superimposition voltage simulation

If the well-chosen device in the GPIB bus is found, this is marked by the connecting representation symbol behind the suitable device as groups and the input area is activated for the input of the basic data. It can be thereby given sweep parameters.

Pulsegenerator

Dispose of a DAQ card and a suitable amplifier from TOELLNER, you can generate with this system any rectangle impulses. Select in the area of Devices the voltage source and the amplifier.

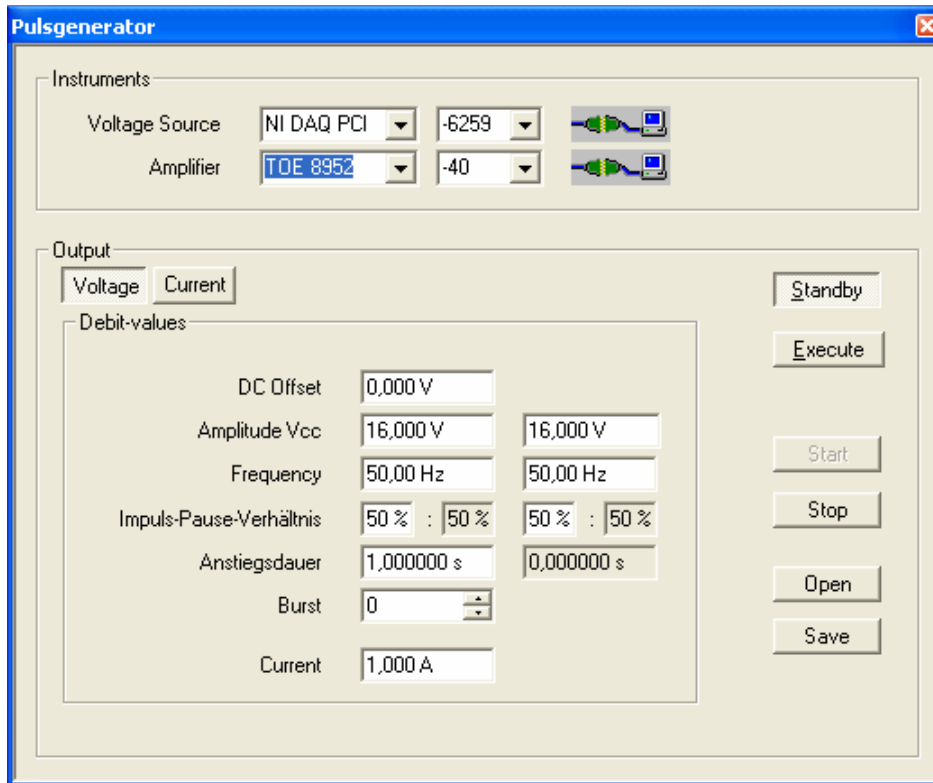


Fig. 54: System pulse generator

Put the desired source data. Besides, you can allow to vary the amplitude, the frequency and the impulse break relation linearly for the increase duration. You can also store the settings and use for a macro file.

Arbitrary function

The Arbitrary function can be likewise built up as a system. Besides, generator as well as the DAQ card can serve the arbitrary power as an arbitrary source.

Arbitrary power generator as an Arbitrary source

To use the arbitrary power generator as an arbitrary source, choose *systems* arbitrary function and select as an arbitrary source the desired power generator. With multiple curves this can be put for each of the given curves differently, i.e. several synchronous systems can be built up.

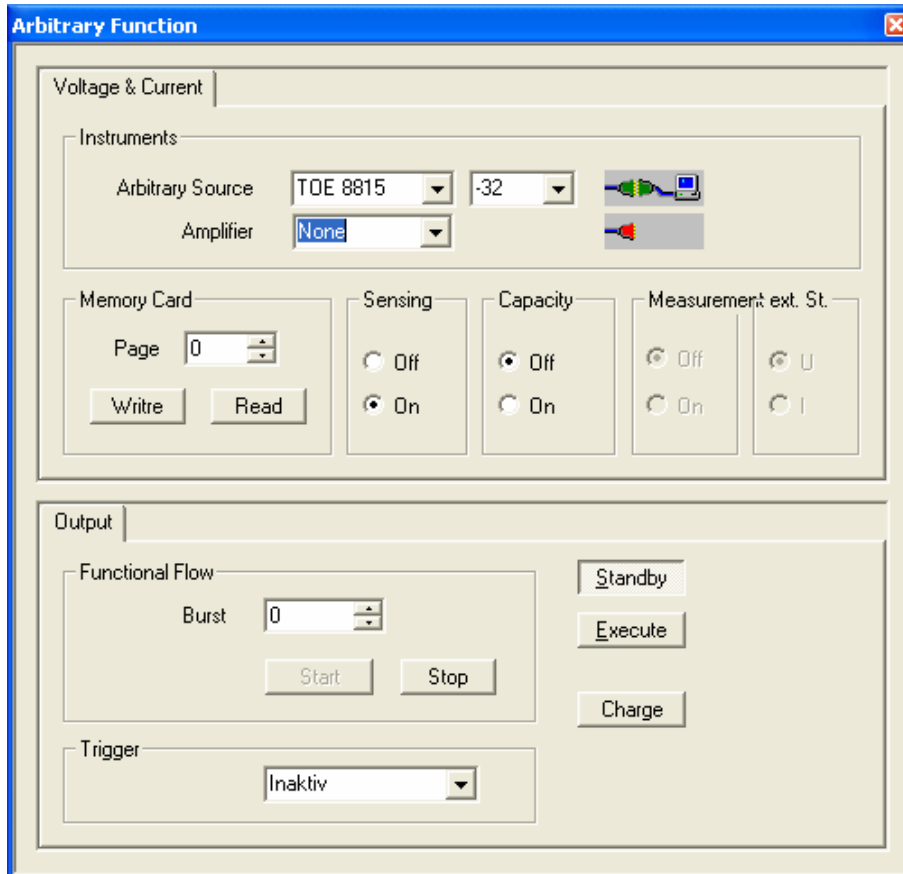


Fig. 55: System Arbitrary function canal 1

As an amplifier to the strengthening of voltage, current or achievement the TOELLNER power supply of the series TOE 8870 which serve TOE 8840/50 series and the TOE 8950 series or the TOELLNER 4 quadrant amplifier can select be selected *by devices for curve amplifier*.

About exit function expiry lets itself about the burst input the number of the curve flows define.

The topical curves are processed *by exit store* for the system and are transferred in the arbitrary power generator above the GPIB interface into the device memory.

Should the data which are topically in the device memory of the arbitrary source on a plugged in memory card be stored use the point memory card *writing* and, besides, give still the page on which the curve should be stored away. Attention: a curve already stored away on this page is headlined without further inquiry!

To the back reading of a curve which is on the Memory Card you select under Memory Card *page* the page number on which the curve is, and press *the reading button*. With it this curve is read in the device memory of the power of generator.

In the area of *Output Trigger* you can activate the trigger function. There is the possibility to use the trigger for the cancelling or as a break. The trigger signal is put on at the digital input of the DAQ-Card with 5 V. With the function cancelling, the process is broken off. Another trigger pulse begins the curve in the start address again. With break the expiry is stopped and continued with the next trigger again in the next devices memory address.

DAQ-Card as an Arbitrary source

To use a DAQ card as an Arbitrary source, choose *systems Arbitrary function* and select as an arbitrary source the desired DAQ card. As an amplifier to the strengthening of voltage, current or achievement the arbitrary power can select the generators which serve TOELLNER power supplies of the series TOE 8870, TOE 8840/50, TOE 8950 or the TOELLNER 4 quadrant amplifier which you *by devices for curve amplifier*.

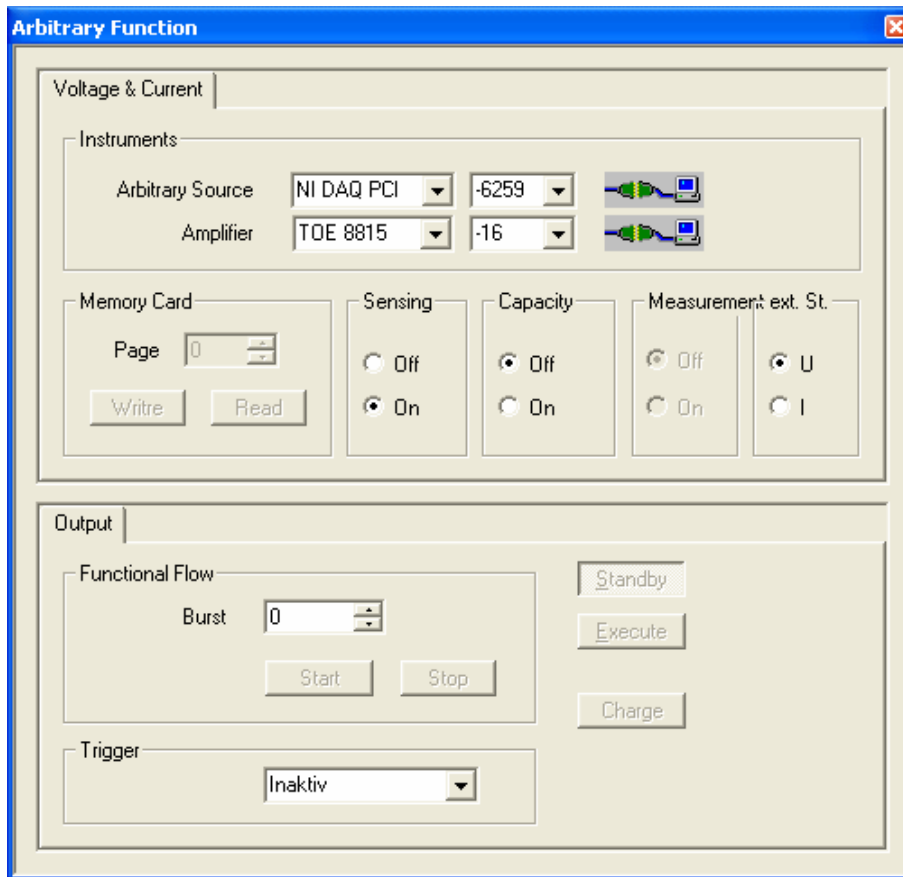


Fig. 56: DAQ card with zweikanaliger signal issue

If the well-chosen device in the GPIB bus or in the system is found, this is marked by the connecting symbol behind the suitable device as groups. Any necessary setting of parameters or device setting carries out the software automatically. If no GPIB bus is connected, or is selected as an amplifier of the TOE 7610 4 quadrant amplifier, the devices serving as an amplifier must be put by hand.

The number of the curve flows about the burst information can be defined *over exit function expiry*. *By exit store* the topical data will transfer to the DAQ card.

Sequence executing

For the start of a sequence you go to the menu point *Systems sequence*. This is only active if the sequence parameters are given and are selected or the file also contains an interval.

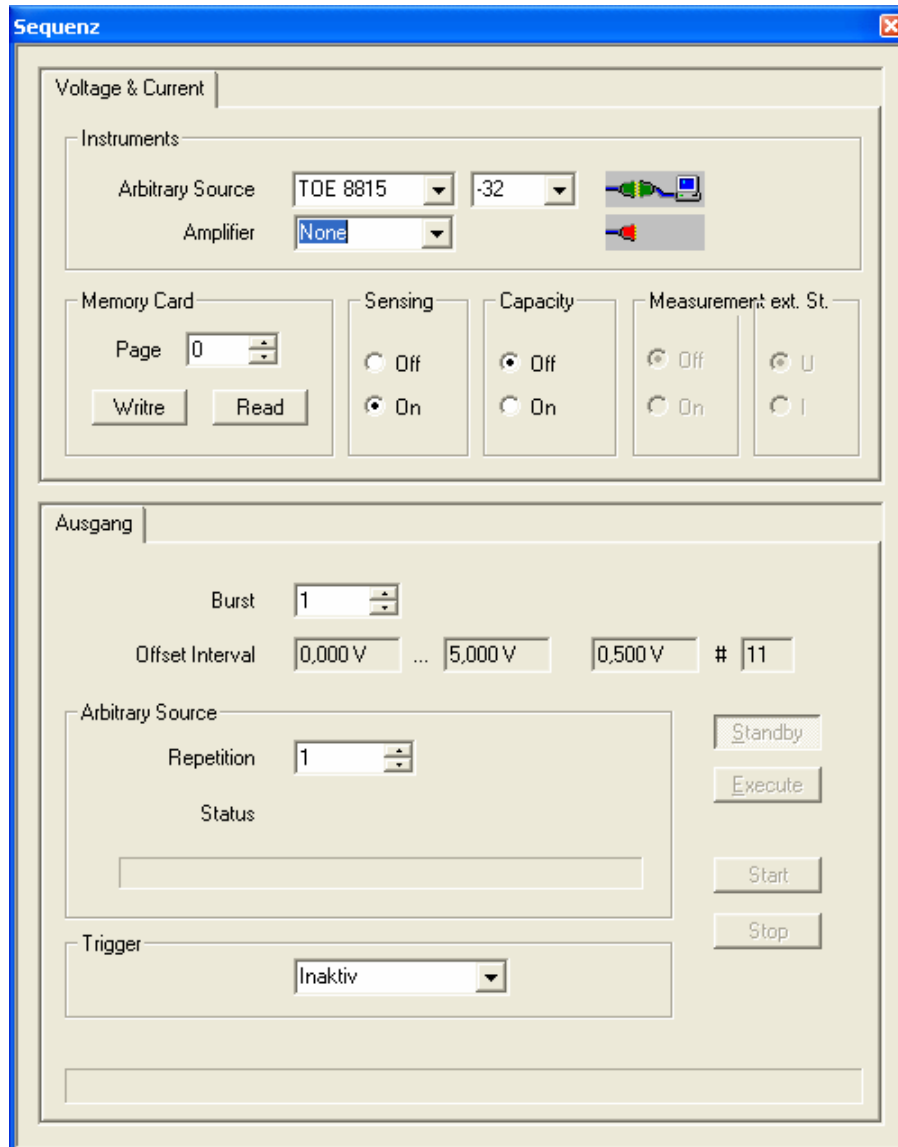


Fig. 57: Sequence

The inputs necessary moreover and definitions become, how under the chapter Sequence input described, carried out.

On this occasion, generator as well as the DAQ card can serve the arbitrary power generator as a signal source.

Arbitrary power generator as a sequence signal source

To use the arbitrary power generator as a signal source, choose *systems sequence* and select as an arbitrary source the desired power generator.

As an amplifier to the strengthening of voltage, current or achievement the TOELLNER power supplies of the series can serve TOE 8870 or the TOELLNER 4 quadrant amplifier which you select *by devices amplifier*.

Any necessary parameter setting the software does automatically. You define the expiry parameters *over sequence exit*. The single steps of the sequence function form a whole curve. Besides, burst gives the number of flows, how often the whole curve should run off. The input *of sequence exit repetitions* defines the number of the repetitions, how often a voltage value calculated anew or a current value calculated anew should become run through.

Operate the start button and the sequence runs off self-sufficiently.

DAQ-Card as a sequence signal source

To use a DAQ-Card as a signal source for the sequence, choose *systems sequence* and select as an arbitrary source for the curves the desired DAQ card. The suitable canal on the DAQ card is automatically assigned.

As an amplifier to the strengthening of voltage, current or achievement the Arbitrary power can select the generators which serve TOELLNER mains appliances of the TOE 8870 series, TOE 8840/50 series, TOE 8950 series or the TOELLNER 4 quadrant amplifier which you *by devices for curve amplifier*.

With the button *Execute* the exit of the system is activated. At the end of the sequence the exit with the button *Standby* can be switched off.

Any necessary parameter setting the software does automatically. *About exit Burst* if the number of the curve flows can be defined. *In the field Arbitrary source Repetitions* you put down the number of the repetitions of single sequence steps.

The sequence is begun *by exit start*.

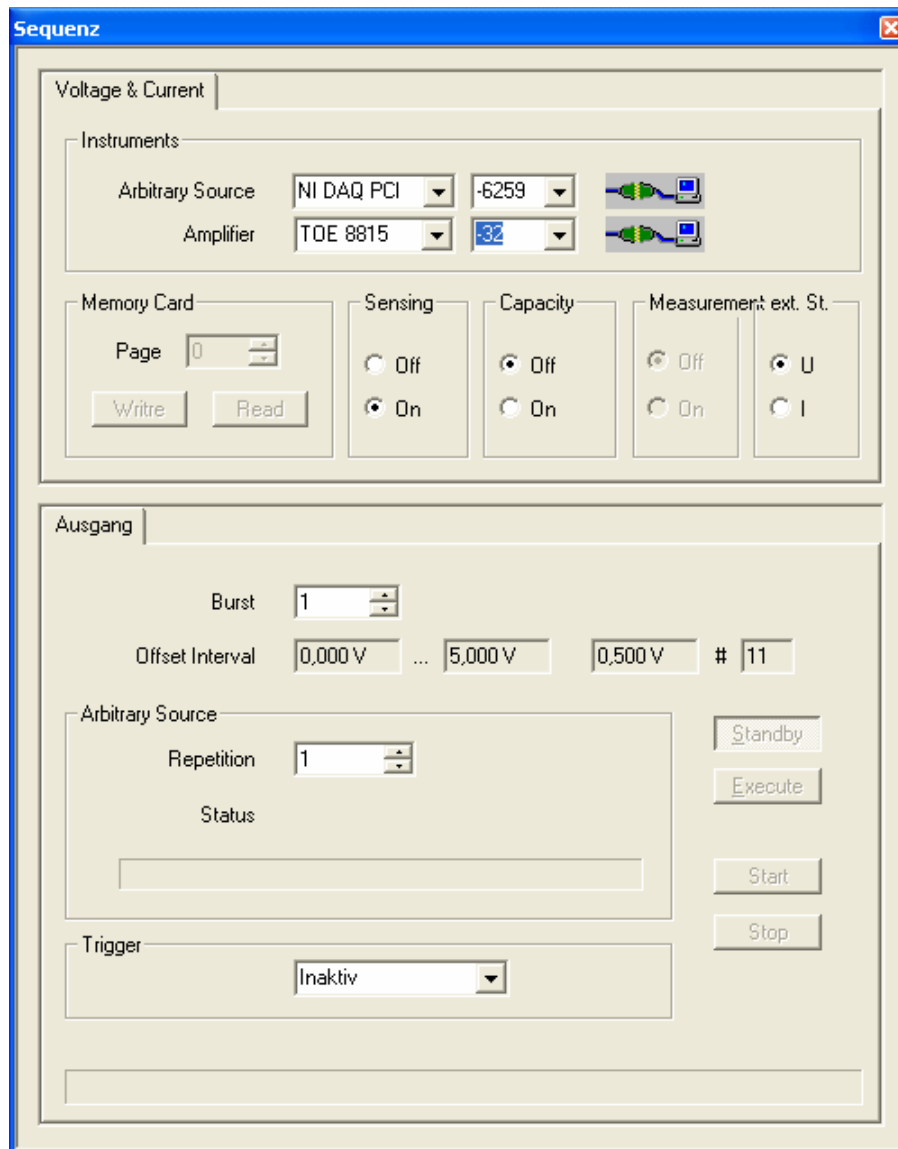


Fig. 58: System sequence

In the area of *Exit Trigger* you can activate the trigger function. There is the possibility to use the trigger for cancelling or as a break. The trigger signal is put on at the digital input of the DAQ-Card with 5 V. With the function cancelling, the process is broken off. With break the expiry is stopped and continued with the next trigger again.

Memory Card drive

About the menu point Systems Memory Card drive if the TOE 9030 the memory card drive and writing utensil is controllable. With it device curves (also with its parameter settings for a system) can be transferred and the Memory Cards can be formatted.

In order to store away of data on the Memory Card, you select *under system Memory Card drive side* the page number under which the curve should be stored away. Attention: a curve already stored away on this well-chosen page is headlined without further inquiry!

Should stored curves be already read on the Memory Card back, also select here the page number on which the curve to be selected is deposited and press then *to the vintages* button.

The *extinguishing* button serves for the extinguishing of a curve already stored on the Memory Card. The page gives the page number which should be extinguished.

With the button of *formatting* it is formatted the whole Memory Card. All data and curve information on the card get lost with it.

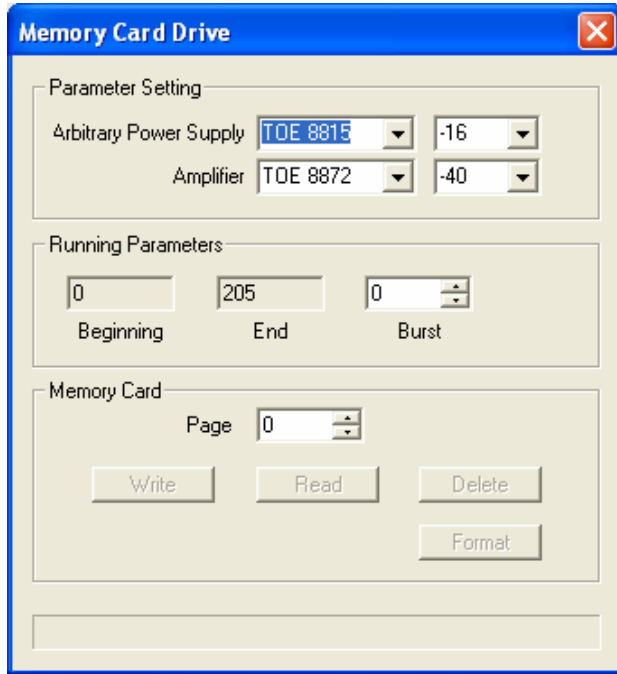


Fig. 59: System Memory Card drive

Devices

Begin the program ArbNet. Choose in the menu of *extra* the entry *device overview*.

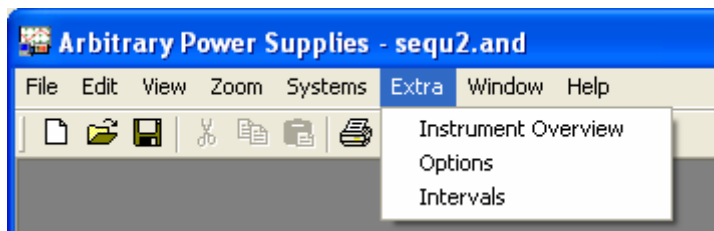


Fig. 60: Menu point of extra

You find there from the program all recognized devices. For the devices which are supported by the software you receive further information like model name, standard number, devices software version and information to the interface, as well as information about the license.

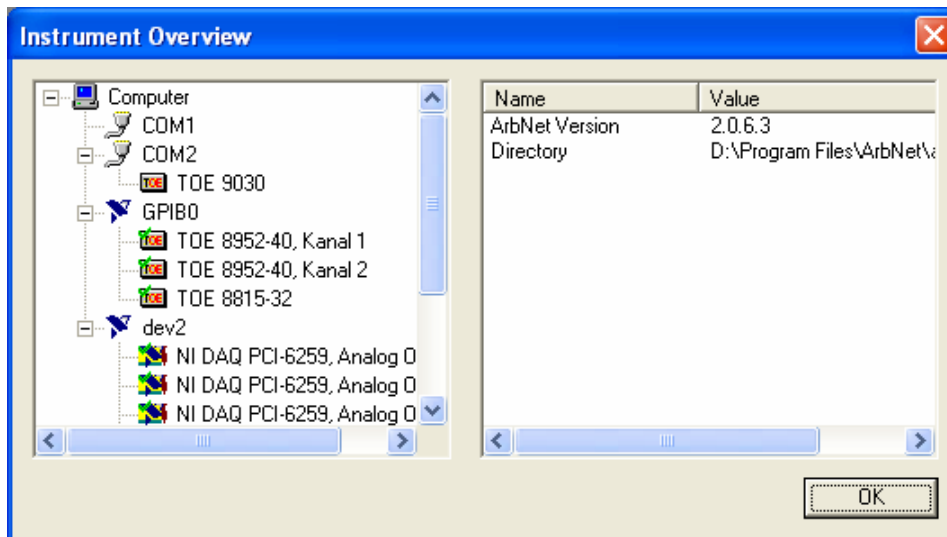


Fig. 61: Device overview with devices in different interfaces

By clicking the device in the tree structure you receive on the right the accompanying device information.

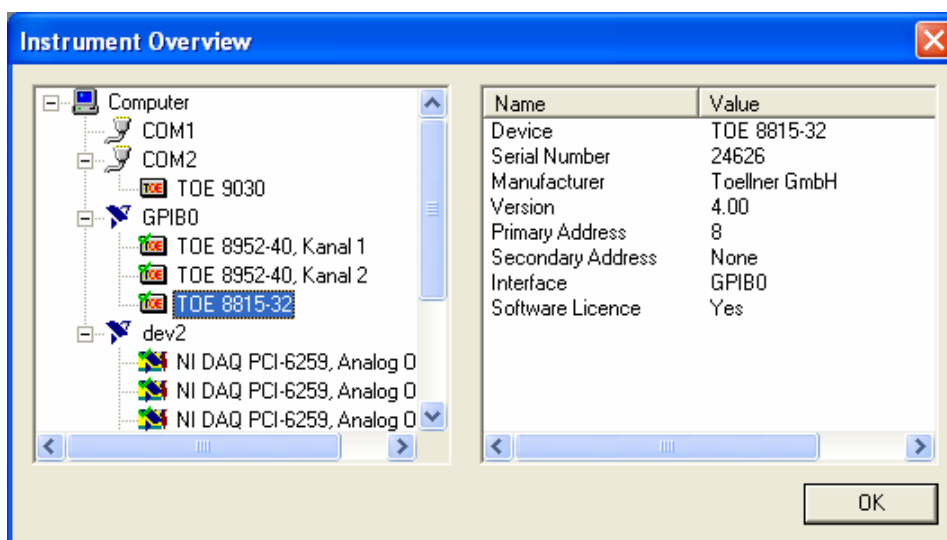


Fig. 62: Device overview with device information for TOE 8815-32

Exemplarily the detailed view is shown in the picture for 8815-32. Important information is the device name and the standard number, because this must agree with the license. Then still the valid software license necessary for the company of the device.

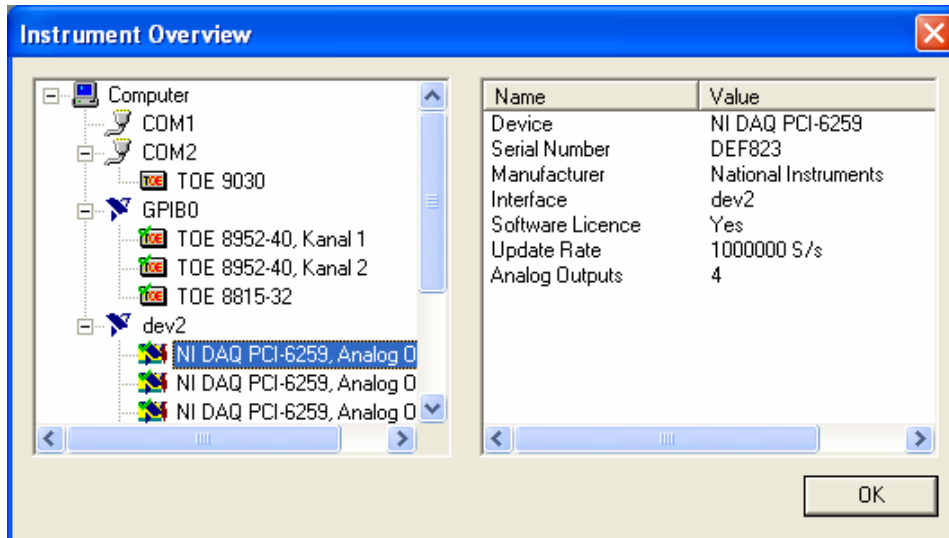


Fig. 63: Device overview with device information for NI-DAQ

In the device overview you can allow to indicate the card information of the DAQ card.

Options

To the setting of the options you reach about the menu point of *extra options*.

You have at disposal the tabs "Diagram" and "DAQ Card". If the program was begun with the option / server still the tab server which is described in the segment „ Remote of control “ exists in addition.

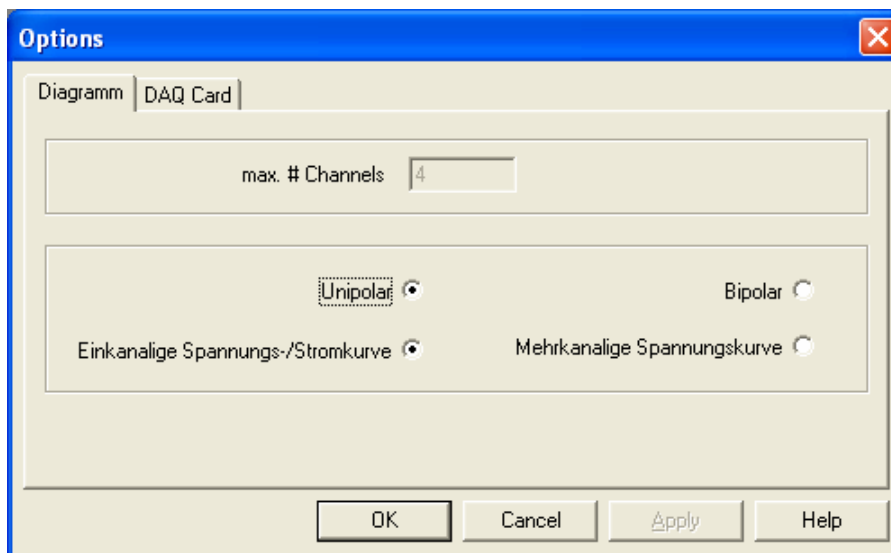


Fig. 64: Dialog options Diagram

Here you take settings for the graphic representation of the curves before. At first you decide on "voltage and current curve" or „multiple of voltage curve“. The voltage and current curve “is always single output and can be only "unipolar". This makes sense, because most arbitrary devices are pursued in the first quadrant. With the "multiple of voltage curve“ you can give the maximum number of the canals and to yourselves for unipolar or decide bipolar. Typically these curves are generated by the DAQ card or multiple amplifiers are used. The at most number of the canals is limited to 8.

In the tab "DAQ Card" settings to the DAQ card are carried out. Depending on the efficiency of the computer and the used DAQ card it can be necessary that the sampling rate must be limited, because the data cannot be processed for the DAQ card fast enough and be made available.

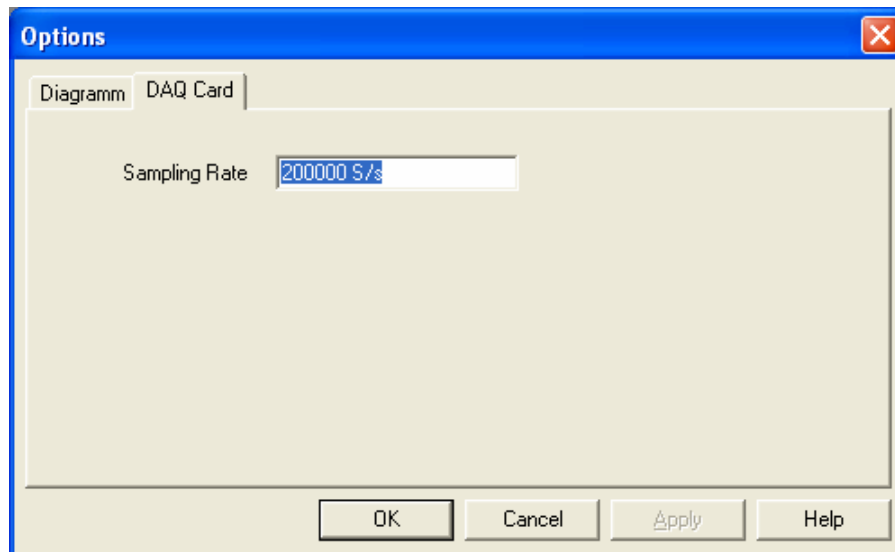


Fig. 65: Options DAQ Card

Info about ArbNet

You find out information about the software about the menu point? *Info about ArbNet*.

You see the software version, the number of the licensed devices and the software variation in the dialog box. If the word "(DAQ)" is indicated below the button *OK*, you have installed the program with support for DAQ cards, otherwise without.



Fig. 66: Info about ArbNet

Remote control of the software

The software can be integrated about the remote interface into test systems or own programs. Besides, it takes over the function of the "server" and the test system is the "client". The communication occurs about TCP/IP by which a distribution on two PCs is possible.

The remote interface was realized in the form of DLLs. A DLL is available for the script language python 2.2 and a Win32 DLL which can be integrated into suitable programs or own developments. For the server mode the software must be begun with the option / server.

In this case you receive under extra-> options an other tab to the "Server" properties. Normally the port 700 of of the DDL is used, so that this setting should be changed only when required.

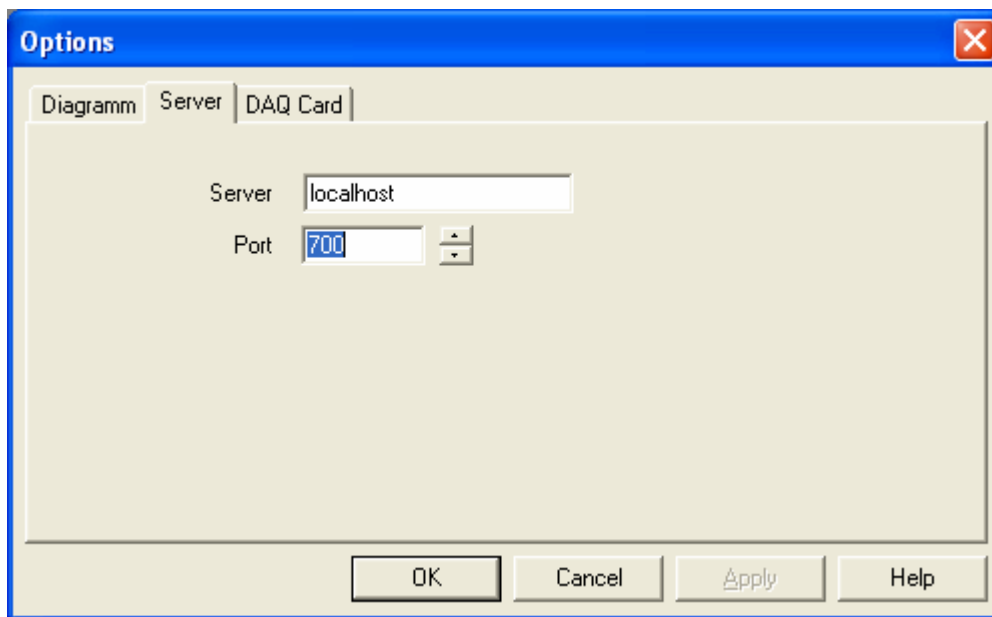


Fig. 67: Dialog server options

If the server and the client on the same computer is explained, the server setting "local host" makes sense, it is dissolved on the IP address 127.0.0.1. You can also use any other name which is changed by the name resolution (DNA) in the right IP address. Also the entry of the IP address is possible.

Running client and server on a PC, the start can also occur about the DLL. You take details to the DLLs please from the DLL description.

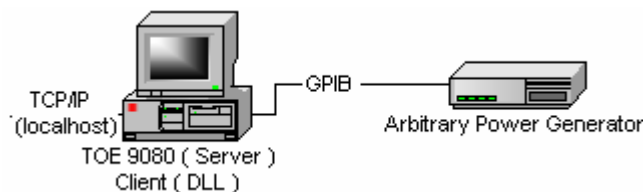


Fig. 68: Remote control with a PC

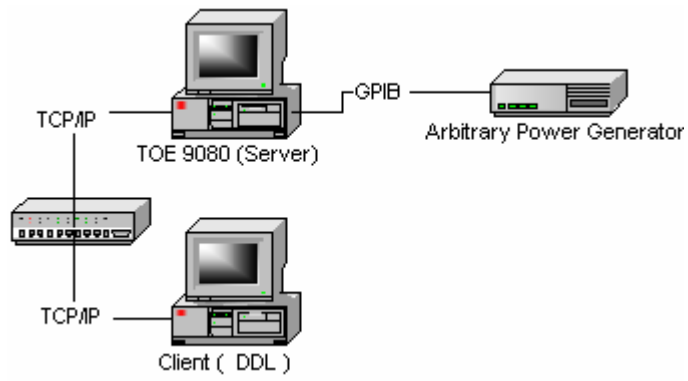


Fig. 69: Remote control with 2 PCs

Appendix A: GPIB controller

National Instruments



The driver software „NI-488.2 for Windows“ version 2.3 of National Instruments supports the following GPIB controllers for Windows 2000/XP. (Windows 98 and ME is not supported.)

- NI AT-GPIB/TNT (PnP)
- NI GPIB-ENET / 100
- NI GPIB USB B
- NI PCI-GPIB
- NI PCI-GPIB +
- NI PCI-GPIB/LP
- NI PCI-8232
- NI PCI express train [™] interface for GPIB
- NI PCMCIA-GPIB
- NI PCMCIA-GPIB +
- NI GPIB-1394
- NI GPIB-1284CT
- NI GPIB-232CV-A
- NI GPIB-232CT-A

For more information and possible restrictions please look at the hardware documentation and visit the NI web site at www.ni.com.

Agilent Technologies

The driver "Agilent IO Libraries suite 14.0" from Agilent Technologies supports the following GPIB controllers for Windows XP/2000.

- 82357A GPIB USB / interface GPIB
- 82350B PCI High performance interface GPIB Card
- 82350A PCI High performance interface GPIB Card
- E5810A LAN / gateway GPIB
- E5805A USB/4 port interface RS232
- E5813A Networked 5 port heave USB
- E2050A gateway LAN/GPIB
- E2050B gateway LAN/GPIB

For more information and possible restrictions please look at the hardware documentation and visit the Agilent web site at www.agilent.com.

Keithley



For the hardware of Keithley it is necessary to install the CEC 488 driver Version 8.0 for Windows XP/2000.

Following hardware is supported:

- KPCI-488
- KUSB-488

For more information visit the Keithley web site at www.keithley.com.

Appendix B: DAQ-Cards

National Instruments



The driver software "NI-DAQmx" version 8.3 of National Instruments supports the following DAQ Cards for Windows XP/2000.

PXI Express M Series
M Series USB
Isolated M Series

NI DAQCard-6024E
NI DAQCard-6036E
NI DAQCard-6062E
NI DAQCard-6715
NI PCI-6014
NI PCI-6024E
NI PCI-6025E
NI PCI-6031E
NI PCI-6032E
NI PCI-6035E
NI PCI-6036E
NI PCI-6052E
NI PCI-6071E
NI PCI-6229
NI-PCI-6259
NI PCI-6711
NI PCI-6713
NI PCI-6731
NI PCI-6733
NI PCI-MOI-16E-1
NI PCI-MOI-16E-4
NI PCI-MOI-16XE-10
NI PCI-MOI-16XE-50

For more information and possible restrictions please look at the hardware documentation and visit the NI web site at www.ni.com.

Glossary

A/D	analogous-digital change. An important task of the digital measuring technology is the change of analogous tension values in digital or discreet numerical values with the help of an analogous-digital converter.
AC	Alternating Current (change tension /-strom).
Analogous tax entrance	about the analogous tax entrance can be steered the exit of an amplifier more than from 0 to 10 V of signal.
ANSI	American Nationwide standards institutes.
API	Application Programming interface.
ARP	Address resolution Protocol. About ARP the Ethernet address belonging to an IP address of a net participant is determined. The ascertained allocations are administered on every single calculator in the ARP table.
Broadcast	as a Broadcast one calls a round call to all net participants. A typical Braodcast application is of the ARP-Request. Also of other protocols – possibly RIP or DHCP – are of use Braodcast announcements.
Coach system	with a coach system several final devices divide one single data line (coach management). Because at a given time in each case only one final device may use the data line, coach systems always require a protocol for the regulation of the access rights.
CAN	controller area Network (CAN) calls a serial coach which was developed in collaboration proficient Bosch and INTEL for the vehicle application. He connects several equal components (Knot, Node) about a 2 wire coach with each other. The CAN protocol allows an efficient transference from digital ones one and issue data as well as from data of the higher communication. On grounds of the high sturgeon security, the low costs and the real time ability CAN is also used in the automation technology.
Cardbus	see PCMCIA, PC Card The Cardbus standard (PC Card standard 5.0) is an unterstandard of the PCMCIA standard. The Cardbus is 32 bits of data coach and the protocol is leant against PCI. The transference rate lies with 33 MHz and is comparable with PCI Cards.
CEC 488	driver's software of Capital equipment for different GPIB controllers. The drivers also offer functions for TestPoint [™] , LabVIEW [™] and other programs.
Client server architecture	the system of the " distributed intelligence " with which the client builds up a connection with the server to take up offered services from the server.
COM port	Communication port. Serial interface in PCs to the connection of periphery devices. If several exist in a PC, are called this with COM1, COM2, etc.
Com server	the final device in TCP/IP-Ethernet to networks which makes available interfaces for serial devices and digital E/A points on the network.
Controller / Converter	for the connection is to be produced it necessarily the connection immediatly to type. If the suitable connections do not exist there, a controller / Converter must be inserted. This can be inserted inside in the PC. Typically the controller / Converter is inserted in a PCI slot or a suitable controller is connected in the external variation to an interface in the PC.
D/A	digital-analogous change. Because-converters have the task to convert numerical values into propotional tensions or streams. It is the return process to A/D.
DAQ	Data Acquisition (data capture).

DAQ	device mostly mehrkanaliges, with A/D-or to D/A converters equipped device to the data capture as well as signal production. DAQ devices enclose Steckkarten, PCMCIA Cards as well as DAQ Pads whose binding occurs near the computer about USB-or FireWire and IEEE-1394 interface.
DC	Direct Current (DC voltage / stream).
DIN	German Institute for Standardization German institute of standardization.
DLL	Dynamic link Library. A DLL is a collection of functions which are loaded during the term of a program. The main advantage of a DLL is that that you can be called by many application programs and must be still loaded only once in the memory.
Ethernet	Ethernet is already possible for a long time for the implement guidance. Besides, it concerns a mature coach technology which is also used in numerous areas of application beyond the measuring technology and test technology. 10BASE-T Ethernet offers a theoretical maximum transference rate of 12.5 MB/SEE Gigabit Ethernet, so 1000Base-T, this raises on 125 MB/SEE, besides the transference rate is split in each case within the network. With 125 MB/SEE Gigabit Ethernet theoretically is quicker than Hi speed USB. However, this achievement is fast decreased if several measuring instruments as well as other devices split the transference rate of the whole network under themselves. The communication over the coach is based on news and the communication parcels impair the speed of the data transfer considerably.
Ethernet address	the unchangeable, physical address of a network component in the Ethernet.
One understands	field coach under the concept "Field coach" in the automation technology quite in general a local network to the connection of field devices. To these field devices count in particular SPS as well as intelligent sensors and Aktoren. Familiar representatives of field coach systems are CAN, professional coach, intercoach-page and Fieldbus a foundation.
FireWire	serves for the transference of serial data; up to 63 devices with star-shaped arrangement. If several devices are connected, a heave is necessary.
One calls frequency with	frequency in general the number of events within a certain period. Events with steady time interval of each other, the period or oscillation duration are most of these regularly repeated events, so. The frequency is the reciprocal value of the period or oscillation duration. Then the frequency is the reciprocal value of the period. Therefore, their dimension is 1 / a time.
GPIB	general Purpose Interface Bus. Also familiar under the names HP-IB, IEEE 488.2 or IEC 625. The GPIB is a proven coach which was conceived especially for implement guidance applications. It offers for 30 years of robust, reliable communication and is on account of the low latency and tolerable transference kinds still the first choice for the implement guidance. The maximum transference rate of approx. 1.8 is suited MB/SEE best of all for the communication with state alone measuring instruments as well as for their control.
Hi speed USB	Hi speed USB offers a maximum transference rate of 60 MB/SEE and is with it an interesting alternative for the binding and control of Stand-alone-and some virtual devices, provided that their Datendurchsatz lies under 1 MS/SEE. Although most laptops, desktop calculators and servers dispose of several USB connections, these are mostly connected everything with the same Host controller, so that all connections split the transference rate of USB under themselves.
HS488	high speed 488. HS488 shows an extension of the IEEE-488.1 protocol and unites a significant increase of the speed with the advantages of the present GPIB standard with guarantee of the compatibility to traditional GPIB devices. With the neuren high-speed check HS488 the transference rate on 8 was raised MB/SEE.

Hub	often also as a star coupler called – offers the possibility to connect several net participants radially with each other. The data parcels which are received on a port are given equally on all other ports.
I/O	input / output (input / issue).
IEC 625	see GPIB.
IEC	internationally Electrotechnical Commission.
IEEE 1394	see FireWire, i. Link.
IEEE	institutes of Electrical and Electronic Engineers.
IEEE488.2	see GPIB.
i. Link	see FireWire Sony christened in 1997/98 the 1394 interfaces IEEE of DV products belonging to companies of FireWire in i. Link around
IO Libraries suite	driver's software which is included in the scope of supply by Agilent products. It concerns an extensive library of functions for different APIs.
IP Internet Protocol.	The protocol which allows the connection of participants who are positioned on different networks.
IP address	the IP address is a 32-bit number which identifies every net participant on the Internet or Intranet unambiguously. She exists of a network part and a user part.
ISA Coach Industry standard Architecture.	He was introduced as a coach type with the IBM PC AT and is called in general also At coach. Since the middle 1900th are most PCs with several PCI slots and only to few ISA slots, if generally, equipped.
LabVIEW	Laboratory Virtual instrument engineering Workbench. LabVIEW is graphic program surroundings with which symbols are used for the production of programs instead of text lines.
LAN	Local area Network. Local net within a restricted area under application of a quick transference medium as for example Ethernet.
LXI	(LAN eXtensions for Instrumentation) is a relatively new LAN-based standard. A Speziifikation defines LXI for state alone measuring instruments with the Ethernet binding which complements Trigger and synchronisation functions.
MAC	media Access Control. The unchangeable, physical address of a network component (cf. Ethernet address).
NI-DAQ	driver's software which are included in the scope of supply of all DAQ Cards by NI. With NI-DAQ it concerns an extensive library of VIs and functions which can be called from application development surroundings.
NI-DAQmx	the most topical version of the driver NI-DAQ contains new VIs, functions and developing tools to the control of measuring instruments.
Period 1.)	in general: regular return of certain phenomena, also the spatial or temporal segment separated thereby. 2.) Period of a function and the following (x): a value l of the domain of definition for which counts and the following $(x+n*k) =$ and the following (x) and n all integers runs through. For example, the function and the following $(x) = \sin x$ has the period 2π . 3.) the repetition of the same states of a physical system in regular time intervals by periodical movements, e.g., with the pendulum.
PC Card	see PCMCIA, Cardbus With the introduction of the Cardbus standard (PC Card standard 5.0) in 1995 PCMCIA Cards were called for the first time officially PC Card. In the meantime, the concept PC Card quite only because of in contrast to acronym PCMCIA has asserted itself an easier marketing.

PCI	coach Peripheral Component Interconnect coach. The PCI coach is a 32 or 64 bit wide coach system which was developed in the end of 1991 by Intel together with other companies. He is strictly standardised and the PCI components are mostly able Plug-and-Play.
PCI Express	train PCI express train is very similar PCI, because it is the newest advancement of the PCI standard. The main difference between the achievement of PCI and PCI express train consists in the fact that PCI express train offers a higher transference rate and assigns to every device a dedicated transference rate. Daten will transfer with 250 MB/SEE per direction about Punkt-zu-Punkt-Verbindungen be called the Lanes. Every PCI express train connection can exist of several Lanes. Therefore, the transference rate depends on how PCI express train is connected to the slot and to the device.
PCMCIA	personal computer Memory Card Internationally Association. This Begiff describes a standard for extension cards for laptops / notebooks. The first standard compiled by the standardization committee (standard PCMCIA release 1.0) was dismissed in 1990. With suitable extension card he can also exist in a computer.
Perl	perl is a very efficient and script language flatly independent of form.
Python	python is a script language oriented to object.
RS232	a standard which is recommended by the instrument Society of America for the serial communication. He is used equally to the concept „ serial communication “. Some other standards which often find use are RS485, RS422 and RS423.
SCPI	standard Commands for Programmable of instrument. SCPI is based on IEEE 488.2 and standardises commands of programmable test devices and measuring instruments and her structures.
Serial communication	a method to transfer data bit-wise between a computer and a device or another computer. In addition a serial interface is used (how RS232 or RS 485).
Serial interface	an one and issue canal for the connection of periphery devices to the PC.
Subnet-Mask	32-bit-worth which fixes which part of the IP address addresses the network and which the network participant.
TCP	transmission Control Protocol. TCP touches down on IP and provides not only for the connection of the participants during the data transfer, but also guarantees the correctness of the data and the right sequence of the data parcels.
TCP/IP	transmission Control Protocol / Internet Protocol.
Traditional NI-DAQ	Upgrade for older versions of NI-DAQ. Traditional NI-DAQ shows the same sentence in VIs and functions, as well as the same functional way on like NI-DAQ 6.9. x. In contrast to NI-DAQ 6.9. x Traditional NI-DAQ with NI-DAQmx on the one and same calculator can be used.
Driver	device product or geräteklassenspezifische software which is based on the imperative understood by the respective device.
URL	uniformly resource Locator. A logical address – mostly on the Internet – to the identification of a document on a server.
USB	the Universally serial bus, briefly USB, has risen in last jahren to the stout standard for the binding of computer periphery devices. This popularity also has effect on the measuring technology and test technology
VI	see virtual instrument (VI).
Virtual COM port	the virtual COM port is only simulated on the PC. Often a Converter or COM server is hidden behind it.

Virtual instrument (VI)	name specific for LabVIEW for a program. VI ahmt the front record and the functionality really of existing measuring instruments after.
VISA	Virtual Instrumentation software Architecture. A manufacturer-covering foundation shows VISAS for the development and integration of software components like device drivers, soft front-Panels and user software which is independent from measuring instrument types, coach systems, operating systems, computer languages and network mechanisms.

Figures

Fig. 1: Welcoming dialog of the installation program	6
Fig. 2: Choice of the set-up type in the installation program	7
Fig. 3: Dialog box of the installation course	7
Fig. 4: End of the installation.....	8
Fig. 5: General representation of the connection possibilities of the devices	10
Fig. 6: Connection possibility compact mains appliance.....	11
Fig. 7: Other connection possibility compact mains appliance	11
Fig. 8: Connection possibility standard mains appliance.....	12
Fig. 9: Other connection possibility standard mains appliance.....	12
Fig. 10: Connection possibility achievement mains appliance.....	13
Fig. 11: Other connection possibility achievement mains appliance.....	13
Fig. 12: Connection possibility 4 quadrant amplifier	14
Fig. 13: Connection possibility Arbitrary power generator.....	14
Fig. 14: Connection possibility Arbitrary power generator for the sturgeon tension simulation.....	15
Fig. 15: Dialog box licence.....	16
Fig. 16: Start with active device search	17
Fig. 17: Choice curves or Macro file	18
Fig. 18: Choice file type	18
Fig. 19: Dialog box options with diagram settings	19
Fig. 20: Window of the voltage and current diagram	19
Fig. 21: Input in a coordinate system.....	20
Fig. 22: Two zoom functions the voltage and the time axis.....	20
Fig. 23: Graphic voltage input	21
Fig. 24: Graphic current input.....	22
Fig. 25: Graphic block mode representation	23
Fig. 26: Color choice for curves.....	23
Fig. 27: Input in the tabular view	24
Fig. 28: Input of a base line in the tabular view	25
Fig. 29: Input correction base line	26
Fig. 30: Input no interference	27
Fig. 31: Input sine interference.....	27
Fig. 32: Curve with subdued sine interference	28
Fig. 33: Input rectangle superimposition.....	29
Fig. 34: Dialog charge / discharge.....	29
Fig. 35: Graphic arts charging and discharging.....	30
Fig. 36: Choice Macro file	31
Fig. 37: New Macro file.....	31
Fig. 38: Input mask for macro	32
Fig. 39: Listing of several wave files	32
Fig. 40: Choice Trigger file.....	33
Fig. 41: New Trigger file.....	33
Fig. 42: Input Burst in the Trigger file.....	34
Fig. 43: Table with sequence	35
Fig. 44: Variable voltage area	36
Fig. 45: Intervals.....	36
Fig. 46: Intervals overview	36
Fig. 47: Sequence with variable time.....	37
Fig. 48: Time interval.....	37
Fig. 49: Interval Overview	38
Fig. 50: Menu point Systems.....	39
Fig. 51: Connecting symbols on-line and off-line.....	39
Fig. 52: System mains appliance company.....	40
Fig. 53: System superimposition voltage simulation.....	41
Fig. 54: System pulse generator	42
Fig. 55: System Arbitrary function canal 1	43
Fig. 56: DAQ card with zweikanaliger signal issue	44
Fig. 57: Sequence	45
Fig. 58: System sequence	47
Fig. 59: System Memory Card drive	48
Fig. 60: Menu point of extra	48

Fig. 61: Device overview with devices in different interfaces.....	49
Fig. 62: Device overview with device information for TOE 8815-32.....	49
Fig. 63: Device overview with device information for NI-DAQ.....	50
Fig. 64: Dialog options Diagram	50
Fig. 65: Options DAQ Card	51
Fig. 66: Info about ArbNet.....	51
Fig. 67: Dialog server options.....	52
Fig. 68: Remote control with a PC	52
Fig. 69: Remote control with 2 PCs	53



TOELLNER

**TOELLNER Electronic
Instrumente GmbH**

Gahlenfeldstraße 31
D – 58313 Herdecke

Phone	+49 (0) 23 30 / 97 91 91
Fax	+49 (0) 23 30 / 97 91 97
e-mail	Info@TOELLNER.de
Internet	www.TOELLNER.de

SIBO

Distribution Germany (South)

**SIBO Electronic
Vertriebs GmbH**

Hofenstraße 2
D – 72351 Geislingen

Phone	+49 (0) 74 28 / 94 01 - 0
Fax	+49 (0) 74 28 / 94 01 - 20
e-mail	Info@SIBO-Electronic.de
Internet	www.SIBO-Electronic.de