T-RecX RTA-VU2 and TEAC LX-1000

First Steps

Configure,
Measuring &
Storage

Content

Foreword

T-RecX and RTA-VU2 (real-time analysis viewer) form a software bundle for data acquisition and visualization. **T-RecX** controls the connected hardware, manages all settings for it, samples the data during the measurement, stores it on a storage media of choice and provides it for RTA-VU2 to present the data in real-time. **RTA-VU2** takes the data from T-RecX in real-time and shows it in different, user defined ways.

To expand the acquisition software bundle to become a full featured measurement acquisition and analysis tool, the **T-Mat** Software package adds powerful analysis capabilities.

# Working without LX-1000 Recorder (Offline Mode)

The need of working offline, without any hardware, often arises when measurements need extensive preparation but the access to the hardware is restricted, e.g. due to shared hardware usage.

That's why T-RecX enables you to prepare your measurement entirely without any Hardware at all.

To begin a measurement preparation in offline mode, create a new configuration file by clicking on the sheet of paper in the toolbar and select the desired number of channels from the appearing dialogue:
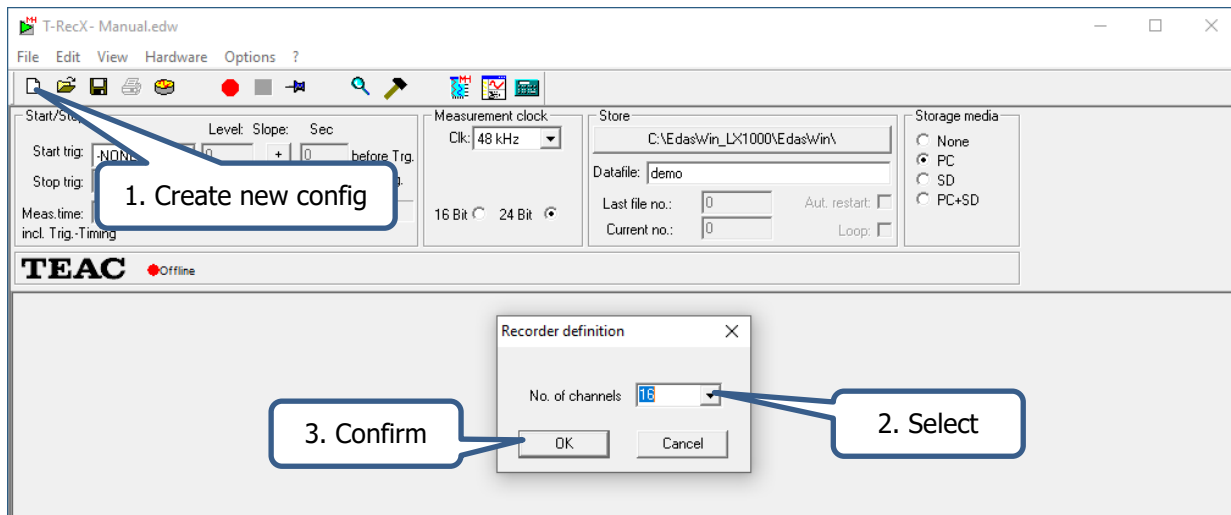
The channel table will show up with basic configuration capabilities
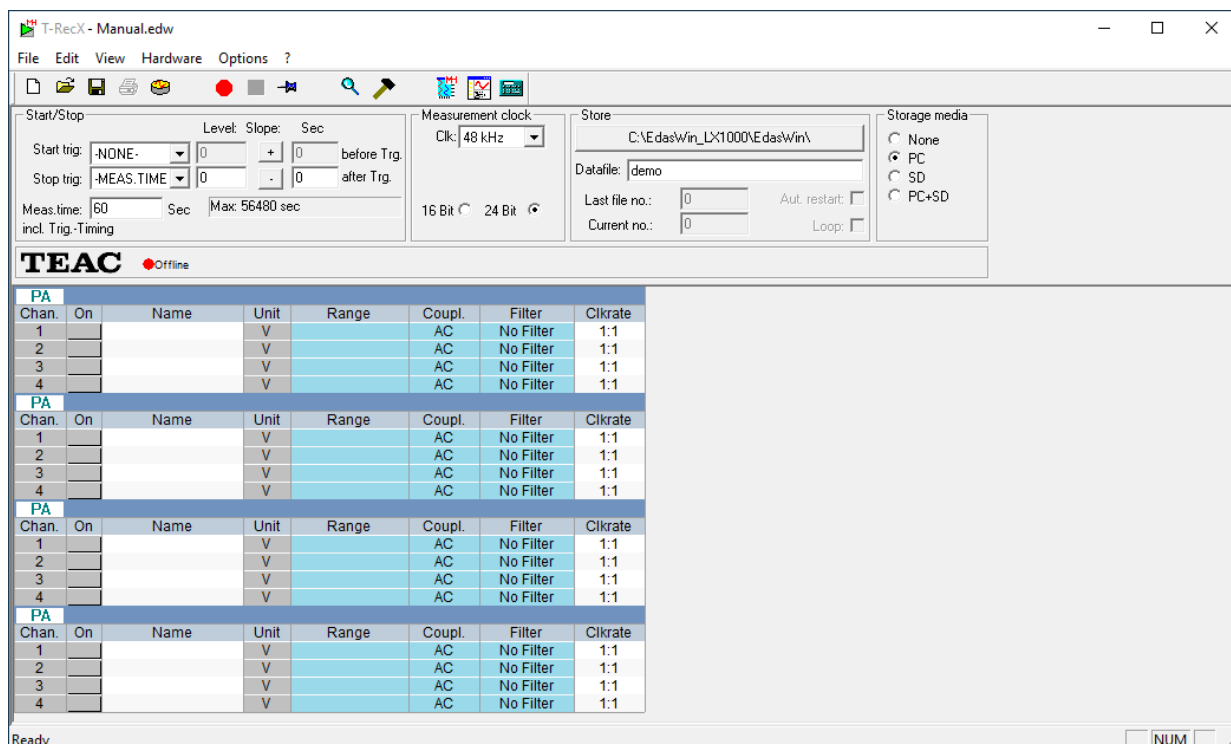
As you can tell from the white box in the upper left corner of each segment (physical slot on the LX-1000) the default configuration for the amplifier modules plugged to the LX-1000 Recorder is assumed as four identical "PA" type amplifiers.

The first thing you want to do when preparing a measurement, is to ensure that the configuration table

maps the hardware configuration of the LX-1000 properly and correct it in case of any mismatch between the default configuration and your actual hardware configuration.

To change the amplifier module type according to your hardware setup, right click on the headline of the segment (slot) you want to change and choose "Module type". The "Module type" dialogue appears that you can choose the fitting module type. Here we will change the "PA" type amplifier module in slot two of the LX-1000 device to an "ST" type amplifier module:
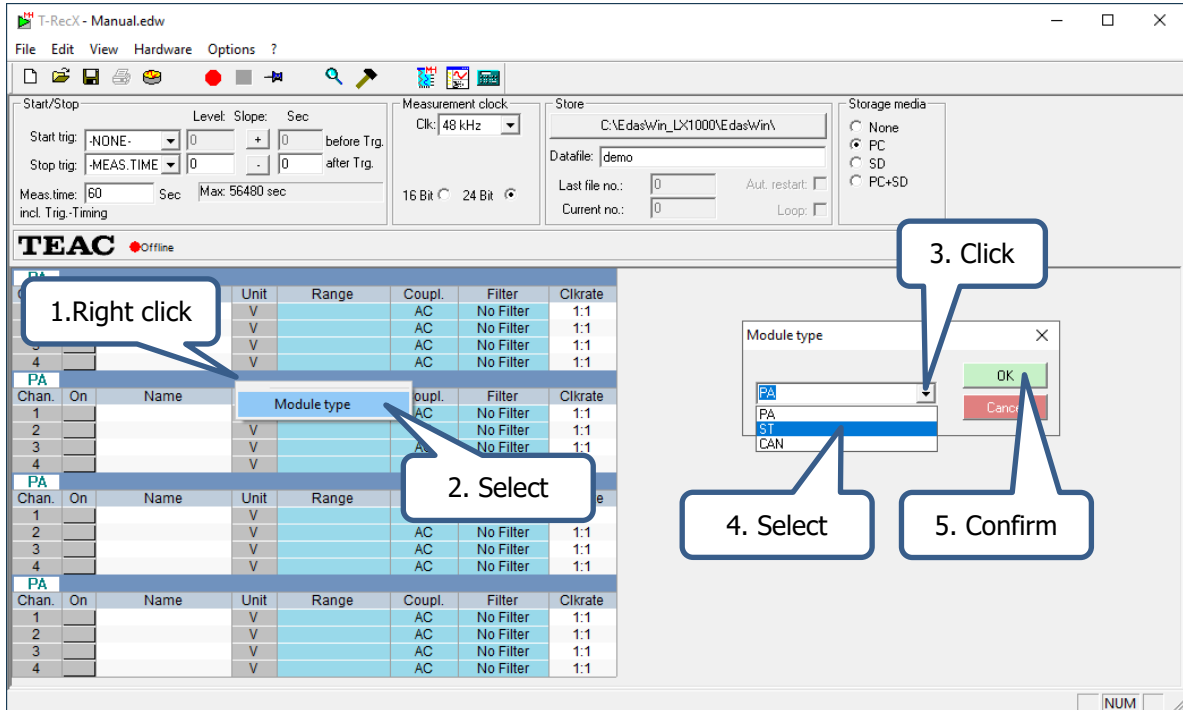
After confirming your choice the table adapts to the new setup:
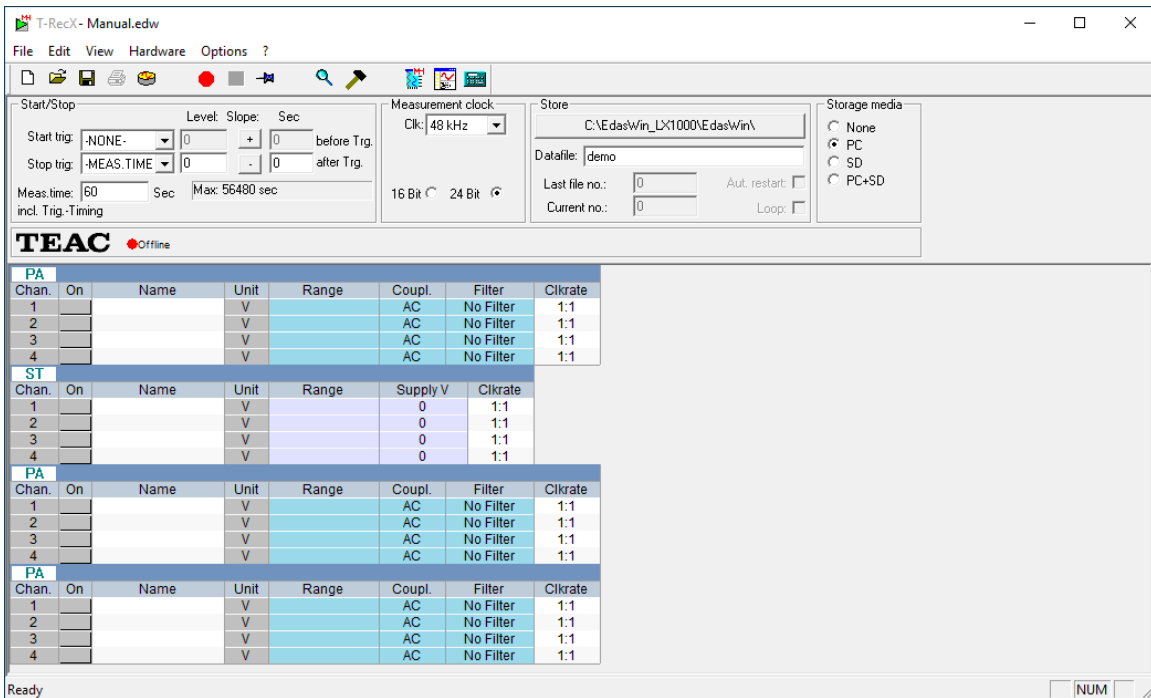
Repeat this procedure for all mismatching amplifier modules until the presented table matches your Hardware entirely.

Configure channels using the channel table

The next thing you probably want to do when preparing a measurement is defining the properties of each channel that participates in the measurement

To do so, T-RecX offers two levels of detail. The basic level is called "Standard mode" while the more sophisticated level is called "Sensor mode".

Standard Mode

The standard mode allows you to choose the voltage input range, the coupling, the hardware filtering and the clock rate reduction. The mapping of the acquired sensor output voltages to the according physical units has to be done in post processing.

Note: Because the "ST" and "CAN" modules still is in development we only cover the "PA" module type

PA							
Chan.	On	Name	Unit	Range	Coupl.	Filter	Clkrate
1	0	PAAMP CH 1	V	1V	AC	HP 5Hz	1:1
2		PAAMP CH 2	V	500mV	AC	A Weighting	1:1
3	1	PAAMP CH 3	V	1V	DC	No Filter	1:1
4					AC	No Filter	1:1

The columns in "Standart Mode" have following meanings/effects:

Chan:

The "Chan" column names the physical channel per slot. Nothing can be altered here.

On:

The "On" column displays the state of the channels.

- A red underlying indicates that the will participate in the measurement after programing

- A green underlying indicates that the channel will participate in the measurement. No further programming needed.

- A grey box without any number in it indicates that the channel will not participate in the measurement.

The number overlaying the respective color indicates the logical channel number. This number increases with each channel that is activated.

To activate or inactivate channels click on the corresponding entry in the "On" column.

Name:

The "Name" column leaves space to name each channel individually.

Unit:

The "Unit" column enables you to determine the physical unit of the measured signal. In standard mode the unit is fixed to voltage.

Range:

The "Range" column allows you to choose the input range of each amplifier from a specified list.

Coupling:

In the "Coupling" column you can alter the coupling mode of the channel. You can choose between:

- DC – Direct current coupling → necessary for measurements with static signals
- AC – Alternate current coupling → used for dynamic signals with negligible static part
- ICP – IEPE conform coupling → used for dynamic signals with IEPE conform sensors

All channels can use different coupling modes.

Filter:

The "Filter" column enables the selection of different, hardware enabled filters:

- "HP 5Hz" enables the hardware high pass filter using a 5Hz cutoff frequency (-3dB) with an decay of XdB per decade
- "A Weighting" enables the A weighted filter (acoustics)
- "C Weighting" enables the C weighted filter (acoustics)

Note: Filtering is only available for channels with AC or ICP coupling

Clkrate:

By altering the entries in the "Clkrate" column you can enable the clock rate reduction for each channel separately.

The clock rate will be reduced by the factor determined in the measurement clock section of the toolbar

Note: The clock rate reduction is not implemented yet

Sensor Mode

The general idea of the sensor mode is, that you give T-RecX the characteristics of the sensor connected to an amplifier and T-RecX will automatically map the voltage signal to the actual physical unit you want to measure.

So, to get to the more sophisticated "Sensor Mode", click on "Options" at the toolbar and choose <Sensor Mode> from the appearing menu.

PA													
Chan.	On	Name	Unit	MR user from	MR user to	Sensor	Sn	V1	EngUnit1	V2	EngUnit2	Coupl.	Filter	Clkrate
1	0	PA_M0_Ch1	V	-1.0[V]	1.0[V]			0V	0[V]	1.0V	1.0[V]	AC	HP 5Hz	
2		PA_M0_Ch2	V	-1.0[V]	1.0[V]			0V	0[V]	1.0V	1.0[V]	AC	A Weighting	
3	1	PA_M0_Ch3	V	-1.0[V]	1.0[V]			0V	0[V]	1.0V	1.0[V]	DC	No Filter	
4			V	-1.0[V]	1.0[V]			0V	0[V]	1.0V	1.0[V]	AC	No Filter	

As you can see, the range column known from the "Standard Mode" is gone, but several new columns appeared instead. These columns are used to calculate the physical equivalent to the voltage output of the sensors and select the actual input voltage range the amplifiers have to be set, to fit the user defined range while using the most suitable input voltage range of the amplifiers.

The meanings of the new columns are:

Unit:
Enter the physical unit corresponding to the excitation of the sensor here.

MR user from – MR user to:
Enter the low (from) and high (to) limit you expect using the physical unit corresponding to the excitation of the sensor.

Sensor:
The "Sensor" column leaves you space to name the sensor used at the measurement location. You may leave it empty

Sn:
Enter the serial number of the sensor used in the "Sn" column. You may leave it empty.

V1 – EngUnit1 – V2 – EngUnit2:
All these columns belong together! You have to fill all of them accordingly.

These columns are used to map the actual voltage acquired to the desired physical unit given by the "Unit" column. The way this calculation works is similar to a two point calibration thus it only works well with sensors which have a linear relation between excitation level and output voltage level.

- V1: Enter the output voltage at a certain load
- EngUnit1: Enter the load corresponding to the voltage entered in the "V1" column
- V2: Enter the output voltage at a certain load (higher load than corresponding to "V1")
- EngUnit2: Enter the load corresponding to the voltage entered in the "V2" column

To get back to the "Standard Mode", click on "Options" at the toolbar and choose <Sensor Mode> from the appearing menu.

Example 1: Temperature

Temperature measurement with following conditions:

Measuring range: -50°C to 100°C

Sensor parameter: 0°≜ -1.5 V & 100°C ≜ 6.8 Volt

Unit	MR user from	MR user to	Sensor	Sn	V1	EngUnit1	V2	EngUnit2	Coupl.
°C	-50[°C]	100[°C]	Thermo471	4711	-1.5V	0[°C]	6.8V	100[°C]	DC
	-1.0[]	1.0[]			0V	0[]	1.0V	1.0[]	AC
	-1.0[]	1.0[]			0V	0[]	1.0V	1.0[]	AC
V	-1.0[V]	1.0[V]			0V	0[V]	1.0V	1.0[V]	AC

Note: DC coupling is used because temperature measurements produce effectively static signals.

T-RecX calculates the amplifier settings from the entered values from the amplifier measuring range.

The amplifier settings and the sensor parameter define the true range (closer information p.13)

Example 2: Acceleration

Acceleration measurement with following conditions:

Measuring range: From -2g to 2 g   (g=9,81m/s²)

Sensor parameter: Sensitivity 10mV/g

Unit	MR user from	MR user to	Sensor	Sn	V1	EngUnit1	V2	EngUnit2	Coupl.
g	-2[g]	2[g]	Accelerome	4711	0V	0[g]	0.01V	1.0[g]	DC
	-1.0[]	1.0[]			0V	0[]	1.0V	1.0[]	AC
	-1.0[]	1.0[]			0V	0[]	1.0V	1.0[]	AC
V	-1.0[V]	1.0[V]			0V	0[V]	1.0V	1.0[V]	AC

Or equivalent:

Unit	MR user from	MR user to	Sensor	Sn	V1	EngUnit1	V2	EngUnit2	Coupl.
g	-2[g]	2[g]	Accelerome	4711	0.01V	1[g]	0.02V	2[g]	DC
	-1.0[]	1.0[]			0V	0[]	1.0V	1.0[]	AC
	-1.0[]	1.0[]			0V	0[]	1.0V	1.0[]	AC
V	-1.0[V]	1.0[V]			0V	0[V]	1.0V	1.0[V]	AC

Note: DC coupling is used because acceleration measurements may produce effectively static signals.

T-RecX calculates the amplifier settings from the entered values from the amplifier measuring range.

The amplifier settings and the sensor parameter define the true range (closer information p.13)

Optional table columns

To activate optional columns click <Options> at the control bar and choose <Optional columns>. Choose the columns you want to activate from the appearing dialog. After closing the selection dialogue the chosen optional columns will appear in the table.

PA Chan.	On	SLNo.	Name	Unit	Pol.	Label	MR from	MR to	MR user from	MR user to	Sensor	Sn	V1	EngUnit1	V2	EngUnit2	Coupl.	Filter	Clkrate
1				V			-1.3107	1.3107	-1.0[V]	1.0[V]			0V	0[V]	1.0V	1.0[V]	AC	No Filter	
2				V			-1.3107	1.3107	-1.0[V]	1.0[V]			0V	0[V]	1.0V	1.0[V]	AC	No Filter	
3				V			-1.3107	1.3107	-1.0[V]	1.0[V]			0V	0[V]	1.0V	1.0[V]	AC	No Filter	
4				V			-1.3107	1.3107	-1.0[V]	1.0[V]			0V	0[V]	1.0V	1.0[V]	AC	No Filter	

With focus on the optional columns:

SLNo.	Name	Unit	Pol.	Label	MR from	MR to
		V			-1.3107	1.3107
		V			-1.3107	1.3107
		V			-1.3107	1.3107
		V			-1.3107	1.3107

SLNo.:

"SLNo" is an abbreviation for "Sensor Location Number" and is used to uniquely identify a measurement location/task/signal.

For example, as a sensor location number of the vehicle speed 133 is selected, and then a subsequent calculation of this number can be defined. If the name of the channel changes, for example: depending on the user's native language, the pre-defined calculations remain valid. A change of channel allocation is therefore without effect. T-RecX supports the definition of sensor location numbers associated with the name, unit and measuring range with the program SignalDB.

These entries can be transferred by drag & drop to T-RecX

Pol.:

The polarity entry assigns how rising/falling signals should be interpreted.

Polarity describes how a positive signal is to be understood. For example: An accelerometer for longitudinal acceleration of a vehicle. If it is installed in the wrong direction it delivers a negative signal if you speed up and delivers a positive signal if you slow down. The polarity documents this behavior, so it will be taken into account during the offline analysis.

Label:

In the label column you can enter paper marks (e.g. for labeling sensor cables). The labels are printable with usual printers directly from the T-RecX software.

MR.:

The column "MR" displays the true input range the amplifiers are set to. The true input range is determined by the software using the data from the columns "MR user from/to" "V1/2" and "EngUnit1/2". It searches for the smallest available input range that fit the needs.

The SignalDB is a powerful tool to manage large amounts of sensors and sensor locations. Once defined, each sensor and sensor location can be used in all future setups simply by using drag and drop. Thus using SignalDB even large catalogues become handy, significantly accelerating your workflow.

SignalDB organizes the defined sensors and sensor locations in several lists providing a neat presentation of all sensors and sensor locations.

Global measurement configuration toolbar

The measurement configuration toolbar contains all the global measurement settings you need to set up. The toolbar is divided in four sections, each correlated to different aspects of the measurement
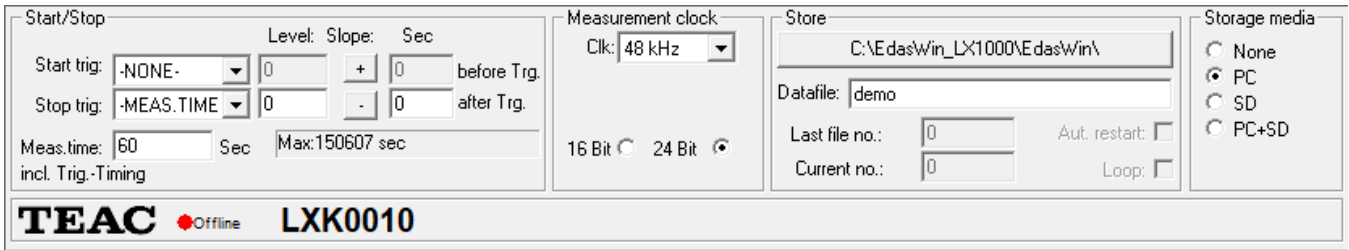
Start/Stop – The trigger section

This section contains everything to set up trigger based measurements as well as the general measurement time.
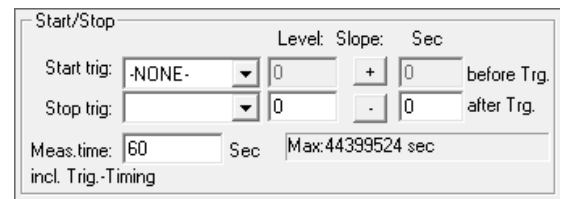
Start trig.: Define the channel sensed by the trigger logic to start the measurement

- Level: Define the trigger threshold (in unit corresponding to the "Unit" column)

- Slope: Define if trigger activates on rising (+) or falling edge (-)

- Sec (before Trg.): Define amount of data to be acquired prior to the trigger activation

Stop trig.: Define the channel sensed by the trigger logic to stop the measurement

- Level: Define the trigger threshold (in unit corresponding to the "Unit" column)

- Slope: Define if trigger activates on rising (+) or falling edge (-)

- Sec (after Trg.): Define amount of data to be acquired after the trigger activation

Meas time: Define the duration of the measurement in seconds (no effect when stop trigger is set).

Measurement clock – The clocking section

This section contains everything to set up the measurement systems sampling frequency and data width.

Clk: Choose the measurement sampling frequency from the dropdown menu

16 Bit: Choose the data width (word length) of each sample

32 Bit: Choose the data width (word length) of each sample
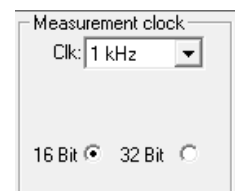
Note: According to the Shannon sampling theorem the sampling frequency has to be twice the highest frequency you want to measure to prevent ambiguous signal reproduction

Store – The storage section

This section contains everything to configure the storage on the measurement PC
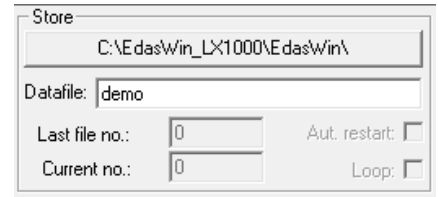
Path: Click on this button to configure the storage path. The chosen path will be displayed on the button (here "C:\EdasWin_LX-1000\EdasWin\")

Datafile: The name of the file to store the acquired measurement data.

By adding a hashtag (#) to the data file name you activate the Serial measurement mode. In serial measurement mode, the hashtag acts as dummy which is automatically replaced by the "Current no". The "Current no" is increased by one each time a new measurement begins.

Last file no.: The maximum "Current no."

Current no.:   The actual "Current no."

Aut. restart: Automatically restart the measurement after the measurement stops. If a start trigger is set, the new measurement will begin when the trigger activates

Loop: Reset the "Current no." to zero when it exceeds "Last file no.". This leads to automatically loop through all numbers between zero and "Last file no.".

Storage media – The media selection section

In this section you can choose which storage media should be used

None: No storage media selected. The acquired data will not be stored

PC: The acquired data will be stored to the measurement computer

TEAC

This section provides information about the connected LX-1000 recorder. The Serial Number of the connected LX recorder is noted right beside the on-/offline indicator

If the indicator is green a recorder is connected, the system is online:
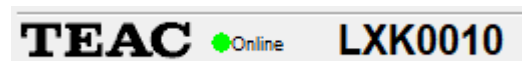
If the indicator is red, no recorder is connected, the system is offline:
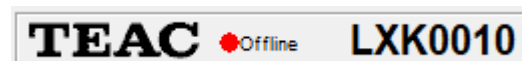
Triggered measurement example

T-RecX allows the definition of start and stop triggers. The amount of data captured prior to the activation of the start trigger and after the activation of the stop trigger can be defined. In addition, it may be defined, if another measurement should automatically be started, when the start trigger activates again after the stop trigger has activated.

Example:

A measurement in a ground vehicle:

Data should be acquired when the speed of 50km/h is exceeded. The data acquisition should stop when the speed drops below 40km/h.

The data acquisition should start two seconds prior to the start trigger activation and stop two seconds after the stop trigger activation.

If the "Aut. Restart" checkbox is checked, the measurement restarts after the measurement gets stopped by the stop trigger activation until "Last file no:" is reached. The last file that would be written in this case is "Manual_30.edt".

Start trig.:	10 Speed	Stop trig.:	10 Speed	
Level:	50	Level:	40	
Slope:	+	Slope	-	
Sec (before Trg.):	2	Sec (after Trg.):	2	

Start/Stop		
	Level: Slope: Sec	
Start trig: 10 Speed ▼ 50 + 2		before Trg.
Stop trig: 10 Speed ▼ 40 - 2		after Trg.
Meas.time: 60 Sec Max:44943383 sec		
incl. Trig.-Timing		

Meas. time: random (not considered because of stop trigger)

Datafile:	Manual_##
Last file no:	30
Current no:	0
Aut. Restart:	Yes
Loop:	No

Store	
C:\EdasWin_LX1000\EdasWin\	
Datafile: Manual_##	
Last file no.: 30	Aut. restart: ☑
Current no.: 0	Loop: ☐

Entire setup:

Start/Stop	Measurement clock	Store	Storage media
Level: Slope: Sec	Clk: 1 kHz ▼	C:\EdasWin_LX1000\EdasWin\	○ None
Start trig: 10 Speed ▼ 50 + 2 before Trg.		Datafile: Manual_##	⊙ PC
Stop trig: 10 Speed ▼ 40 - 2 after Trg.	16 Bit ⊙ 32 Bit ○	Last file no.: 30 Aut. restart: ☑	
Meas.time: 60 Sec Max:44943383 sec		Current no.: 0 Loop: ☐	
incl. Trig.-Timing			

1	0	10	Speed	km/h	0[km/h]	250[km/h]

Serial measurement examples

T-RecX can save the acquired data of continuous measurements to separate files without any loss of data. This is a useful tool, especially if the measurement equipment is placed in a rough environment with potential to malfunction.

In case of a malfunction, all data stored in already closed data files will be protected from damage and only the current file will be damaged.

Note: This only applies, if the malfunction or damage does not affect the functionality of the storage device.

Example 1:

10 Minutes measurement divided to 10 files.

Start trig.:	-NONE-	Stop trig.:	-MEAS TIME-	
Meas. time:	60			

Datafile:	Manual_##
Last file no:	9
Current no:	0
Aut. Restart:	Yes
Loop:	No

Entire setup:

When the first measurement begins, the file **Manual_00** will be created and used for storage. After 60 seconds the file **Manual_00** will be closed and the file **Manual_01** will be created and used for storage. This scheme repeats until the "Lastfile no." is reached. The last file that will be created assuming the given setup would be **Manual_09**. After closing the **Manual_09** file the measurement stops.

Now there are 10 files, one for every minute but in **T-Mat** you still can process these files as one big file.

If, for example, there was a failure after 7 minutes the files named 0 to 6 would be protected because there where closed when the failure occurs and only the files 7-9 may be lost or damaged.

The production of glass panes should be continuously monitored. The data of the last 24 hours should be separated to files of one minute each. All files except the actual file may be analyzed at any time.

Start trig.:	-NONE-	Stop trig.:	-MEAS TIME-
Meas. time:	60		

Datafile:	Manual_####
Last file no:	1439 (24 x 60 -1 = 1439)
Current no:	0
Aut. Restart:	Yes
Loop:	Yes

Entire setup:

When the first measurement begins, the file **Manual_0000** will be created and used for storage. After 60 seconds the file **Manual_0000** will be closed and the file **Manual_0001** will be created and used for storage. This scheme repeats until the "Lastfile no." is reached. The last file that will be created assuming the given setup would be **Manual_1439**. After closing the file **Manual_1439** the measurement restarts by overwriting the "**Manual_0000** file and then continues the known scheme.

The **T-Mat** analysis software will have access to all files written except those that are currently open for writing. Thus, analyzing the almost real time data (t0-1 minute) is possible.

This measurement will run until you stop it with <F5> or the ■ Stop button

Configure the real time visualization

The real time visualization software used in the software bundle is called RTA-VU2 and is especially designed to complement T-RecX.

Using RTA-VU2 for the real time visualization enables the user to present the real time data in various forms and even do real time calculations and analysis such as FFT, PSD, filtering and many more during the measurement.

To switch from T-RecX to RTA-VU2 use the ▨ button from the T-RecX toolbar. To switch back to T-RecX use the <> button from the RTA-VU2 toolbar.

As default, if nothing else is configured, RTA-VU2 will show up with a simple line recorder without any channel assigned. To assign channels to any writer drag them from the channel table and drop them on the writer you want to assign the channel to. You can change the setup of each writer including the assigned channels at any moment, even during measurement.

The channel table is automatically filled with all active channels according to the actual T-RecX configuration.
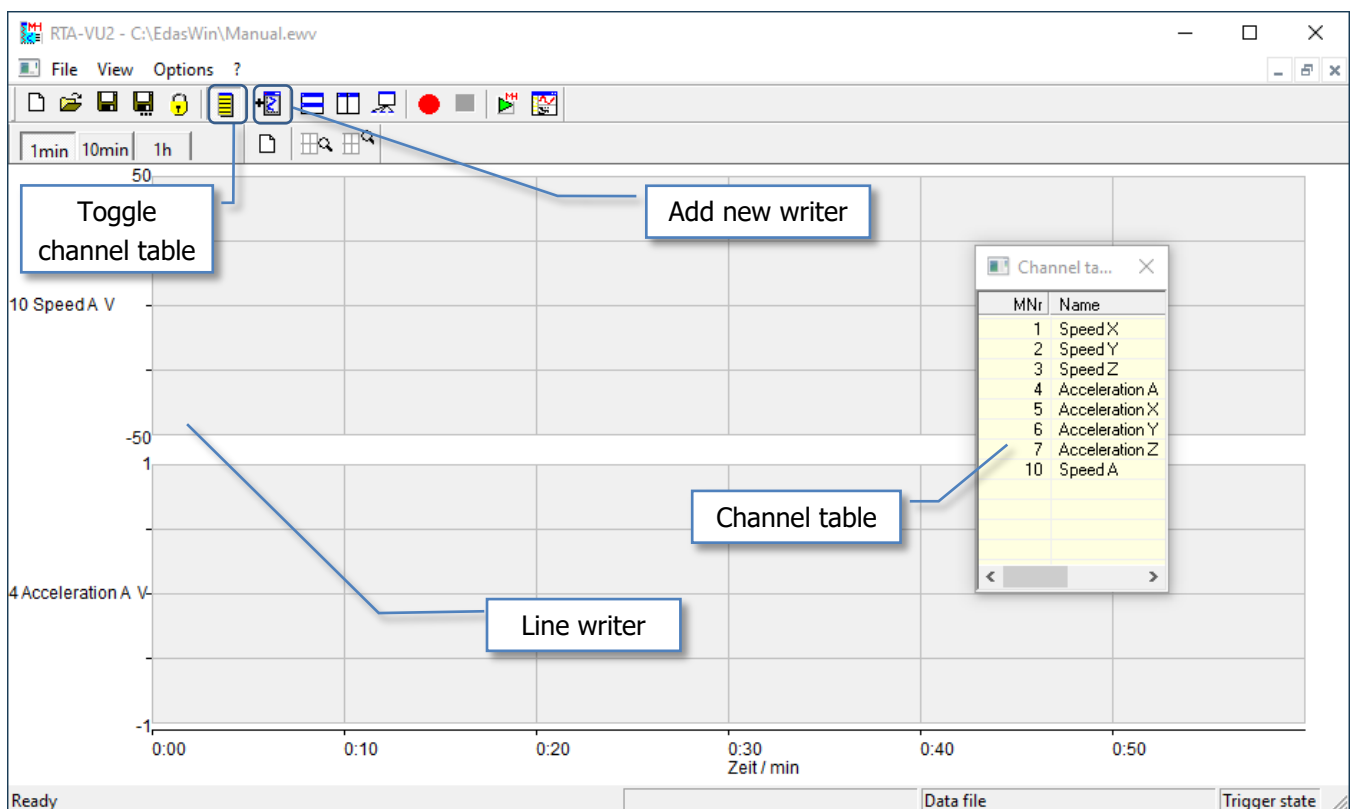
Line recorder time range (X-axis) Settings

The line recorder offers three time ranges. The time range used should be configured before measurement but it is not mandatory (Remember: you can alter all writer settings during measurement, too).

To alter the time range (X-axis range) right click left beside the and choose "Properties" from the appearing context menu.

A dialogue appears where you can alter all time range / X-axis related settings. Leave the dialogue applying the changes by clicking <OK> or without applying the changes by clicking <Cancel>.
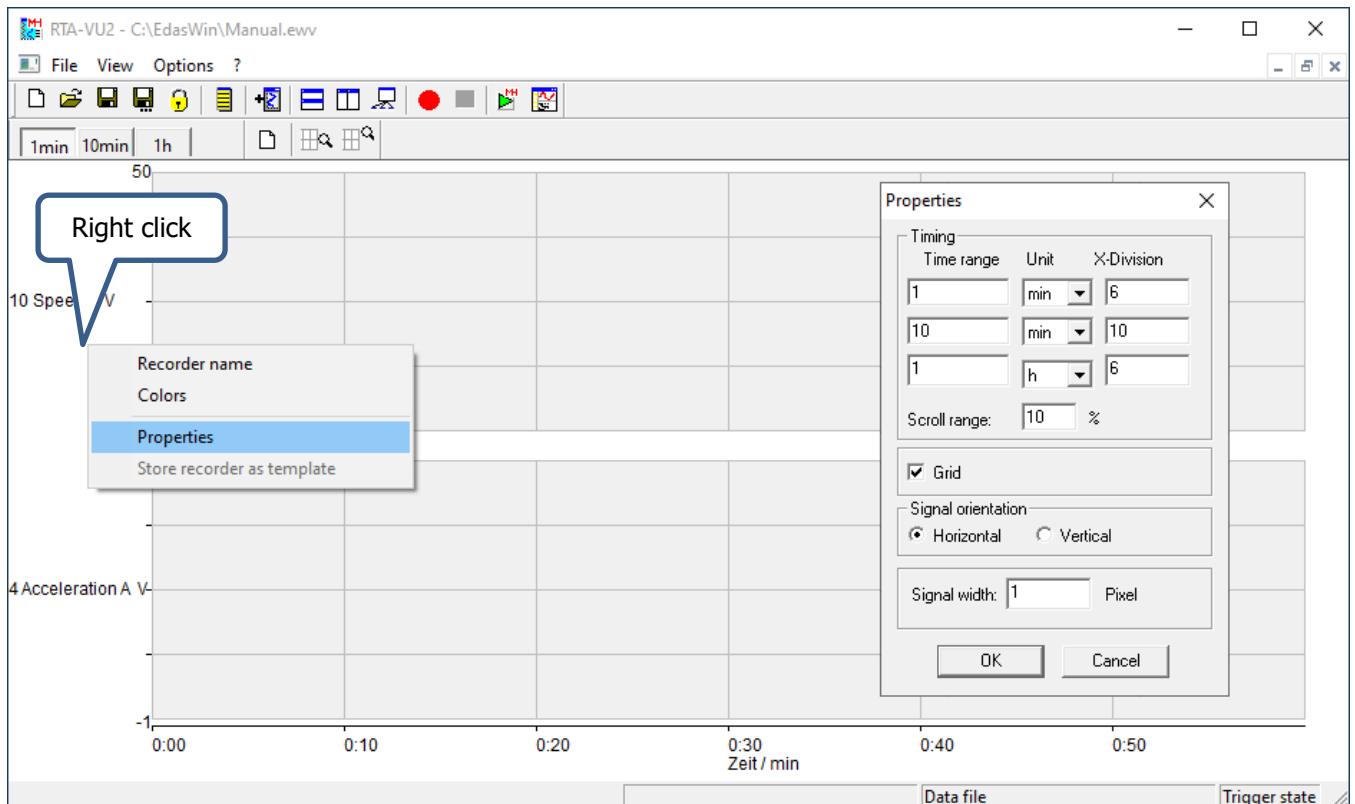
Timing: The timing section refers to the X-axis range and division settings

- Time range: Defines the time range of the X-axis
- Unit: Defines the unit of the x-axis
- X-Division: Defines the step between each division
- Scroll range: Defines the amount of scrolling once the signal exceeds the x-axis range

As you can see there are three repetitions of each field. Each set belongs to one of the range buttons in the upper left corner of the line recorder frame.

Grid: Enables / Disables the underlying grid

Signal Orientation: Switch between horizontal and vertical positioning

Signal width: Define the width of the line representing the signal

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Measuring range (Y-axis) Settings

The Y-axis can be adjusted during the measurement. Left-click on the channel name opens a dialogue. Set Y high and low range of the Y-axis, and confirm with <OK>.
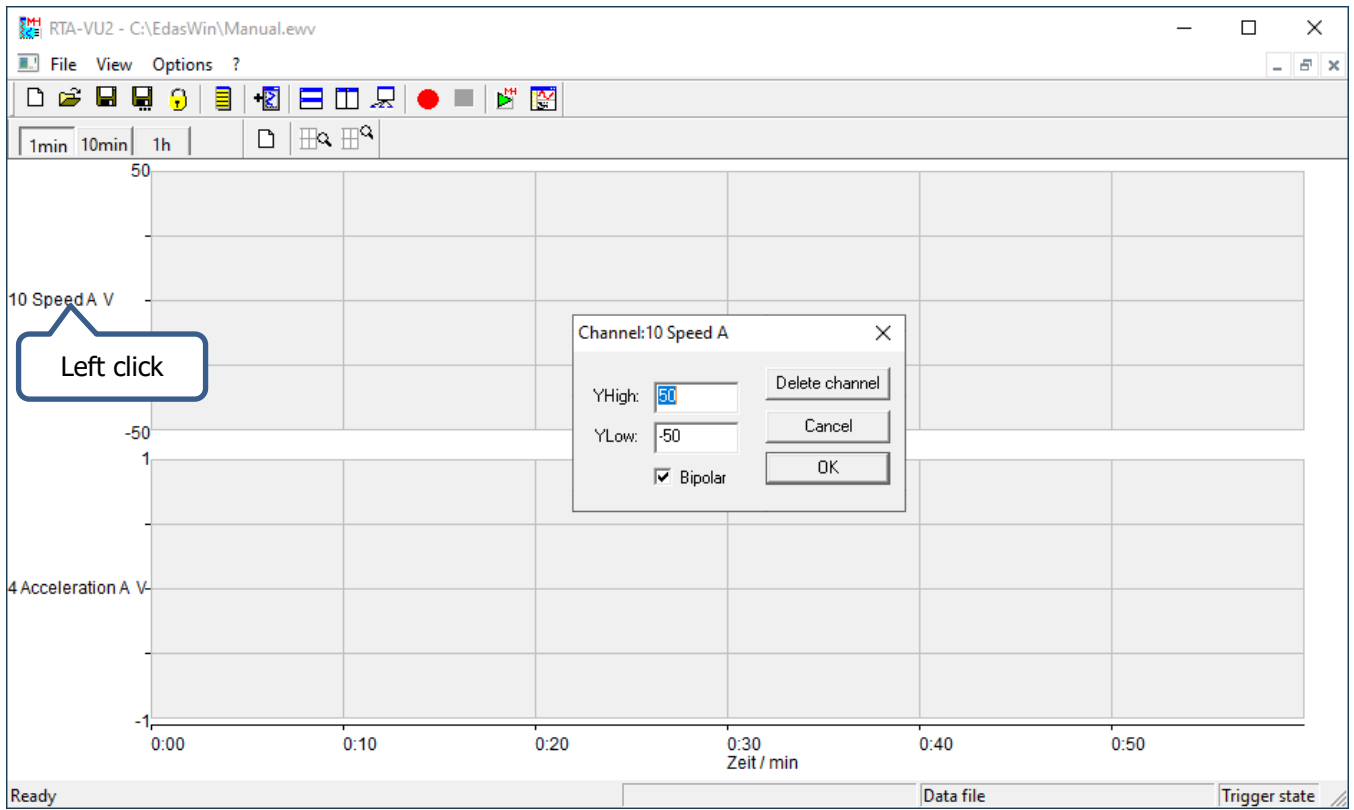
YHigh: Define the maximum Y-axis value

YLow: Define the minimum Y-axis value

Bipolar: If checked, the minimum Y-axis value will be the negative maximum Y-axis value

Delete channel: Delete channel while keeping the writer

Detailed information

For more detailed information about the RTA-VU2 software, refer to the RTA-VU2 manual.

Connect the LX-1000 Recorder

To connect the LX-1000 recorder to the measurement PC you have to establish an Ethernet connection.

When the connection is established, run T-RecX, if it is not already running.

In the case that the connection was established before T-RecX was started, T-RecX will automatically search for connected LX-1000 recorders.

In the case that T-RecX was already running when the connection was established, click on the 🔍 button on the toolbar

In both cases T-RecX will scan the local network for LX-1000 recorders and show the module selection dialogue when it is ready scanning the network.

Select the LX-1000 Recorder you want to connect to using the list within the recorder selection dialogue.

After selecting the recorder, click <Connect> to establish a connection or <Cancel> to leave the dialogue without establishing any connection.
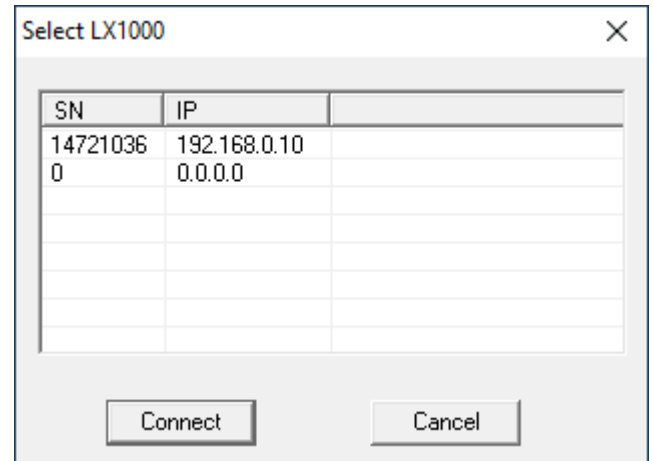
Configuration selection

When the connection is established T-RecX will compare the actual hardware configuration with the active configuration in T-RecX in detail. If both are identical there is no need for intervention. You can go straight to the section "Working with LX-1000 Recorder (Online Mode)".

If there is any mismatch between the hardware setting and the T-RecX setup, T-RecX will prompt following dialogue:
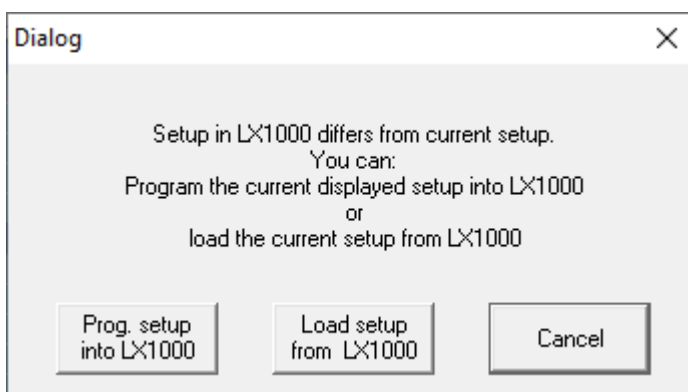
Here you can choose to:

- apply the T-RecX configuration to the LX-1000 recorder by clicking:
  <Prog setup into LX-1000>

- apply the actual LX-1000 recorder configuration to T-RecX by clicking:
  <Load setup from LX-1000>

- manually handle this issue. Click <Cancel>

If you decide to manually handle this issue you can alter the actual T-RecX configuration and program it manually by clicking on the 🔧 button on the toolbar.

Amplifier type mismatch

If you have chosen to apply the T-RecX configuration to the LX-1000 recorder and there are module type mismatches between your setup and the actual hardware, T-RecX will prompt a module type mismatch notification.

As long as the mismatch persists, it is not possible to program any configuration from T-RecX to the LX-1000 recorder.

You can handle this issue in three different ways:

1. Correct the T-RecX configuration:

Correct any mismatching amplifier to fit the hardware setup. Act like described in the "Working without LX-1000 Recorder (Offline Mode)" section.

Online:

Amplifier mismatch:

When the mismatch is corrected, program the LX-1000 hardware by clicking on

2. Apply the LX-1000 hardware configuration to T-RecX

- Choose File → New from the menu (Ctrl+N)

- Click   to establish a connection and apply the hardware setting to T-RecX

Note: Your configuration will be lost

3. Switch the LX-1000 amplifier modules to fit the configuration:

Refer to the TEAC LX-1000 recorder manual to gather the information needed to complete this task. After swapping the modules, switch the LX-1000 on, connect it to the measurement computer and klick   on the T-RecX toolbar.

Working with LX-1000 Recorder (Online Mode)

When the LX-1000 recorder is connected to T-RecX, the white underlying of the amplifier module type indicator will may turn red:

Online, OK: `PA`

Amplifier mismatch: `ST` Type missmatch

If all Indicators turn white and you have prepared your measurement offline, you only have to program once by clicking the ⚒ button. And then you can start the measurement / arm the trigger by clicking on the 🔴 button.

If a type mismatch occurs, adapt the amplifier type like described in the "Working without LX-1000 Recorder (Offline Mode)" section.

The entire setup can be done in online mode exactly like in offline mode

Programing the amplifier modules

The hardware are programmable by clicking the ⚒ button. If something is wrong an error log dialog pops up. The advantage is, that all bugs can be eliminated before starting the measurement. Pressing the start button starts the measurement ensuring it's correct and reliable

Measurement Start and Stop

After entering the measuring parameters, the measurement can be started by clicking on the 🔴 button on the toolbar or the F4 button on the HID. After starting the measurement the stop button ⬛ is enabled to stop the measurement manually. The measurement stops automatically if the predefined measurement duration exceeds or if there is no more space left on the storage device.

Start measuring without data storing

Choose „None", at the store options from the measuring parameters

Measuring Start and Stop with the MH – software module RTA-VU2:

Start and Stop is the same procedure as in T-RecX.