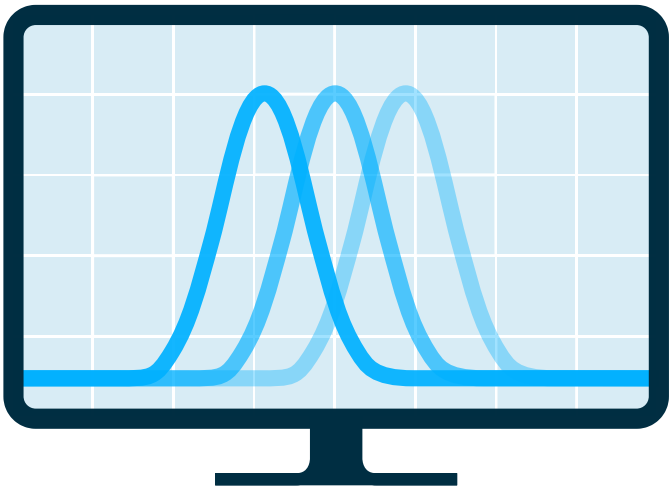

myDLTS

User Manual

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1. About

The myDLTS application is a GUI based measurement platform, created to enable easy DLTS, C-V and I-V measurements. The application handles hardware control, data acquisition and data storage.

All measurement results, together with all parameters at which the measurements took place, as well as additional comments are stored in so called "Session files" (*.mydlts file extension), individual measurements are grouped by measurement type.

Internally, depending on user's choice, session files can use binary or text-based encoding. To learn more about the file format and benefits of each type of encoding, see chapter 13.

All data stored in session files can be viewed in myDLTS app and exported to other formats.

2. Quick start

Below are the steps necessary to perform measurements using myDLTS application. You can use it as a checklist for the initial and all subsequent launches of the app. You will find more detailed information in further chapters of this manual.

I. Set up your hardware and make necessary connections
   A. MFIA
      1. Connect the MFIA device to the PC, preferably using Ethernet
      2. Connect Aux Output 1 to Aux Input 1
      3. Power up the device
      4. Connect the sample between H_{CUR} signal output and L_{CUR} signal input
   B. Temperature controller
      1. Connect the controller to the PC
      2. Configure the device according to manufacturer's instructions
   C. *(optional)* Source-meter
      1. Connect the device to the PC
      2. Configure the device according to manufacturer's instructions

II. Configure the myDLTS application
(Configuration is only necessary on the first launch or if your setup has been modified)
   A. Launch the myDLTS app and go to Settings
   B. In the MFIA tab, enter the address of the device (serial number of the device)
   C. In the Temperature tab enter PID parameters and device specific configuration such as sensor configuration or device identifier
   D. *(optional)* In the Source Meter tab, enter its configuration
   E. In the Other tab, disable the reader mode

III. Perform measurements
   A. Launch the myDLTS app and create a new measurement session by clicking "New" button, and entering information required by the creator
   B. Create a new measurement session by clicking the "+" button, and entering information required by the creator
   C. Enter measurement parameters and click "Measure" to start
   D. When the measurement is finished, the results are stored in a temporary location, you can now close the measurement window
   E. In the session window, click the button to save the data to your session file
   F. Close the session window or create another measurement

3. Hardware

The myDLTS application is built around a specific hardware setup consisting of a Zurich Instruments MFIA impedance analyzer, a Lake Shore 325 temperature controller and a Keithley source meter (other temperature controllers and source meters may be compatible, source meter can be omitted if I-V measurements are not needed).

The application expects at least one temperature sensor of the temperature controller to directly measure temperature of the sample. Readings of this sensor are stored in/with the measurement results. For larger cryostats (larger thermal mass, e.g., closed cycle cryostats) an additional sensor can be used and is meant to be placed closer to cryostat's heater. If the setup uses both sensors, the temperature controller should control the temperature using the second one, as it is expected to react faster. Readings from both fast and slow sensors are used to determine whether temperature is stable.

In the case of impedance analyzer, a bridging connection between two auxiliary sockets of the device is required. The "Aux 1 output", used by the application as an output of a built-in square signal generator, must be connected to the "Aux 1 input", which is used to add the signal to a test signal. The sample needs to be connected between the H_{CUR} signal output (positive pole) and L_{CUR} signal input (negative pole). All connections are shown as orange lines in the Fig. 1.

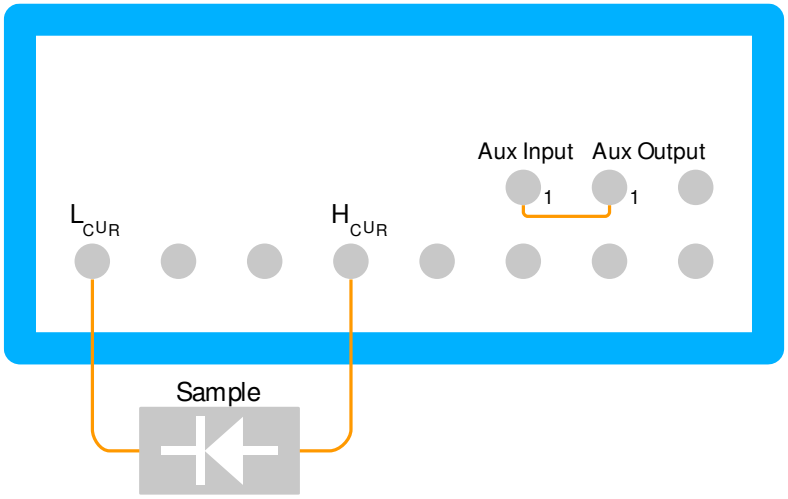

Fig. 1 Impedance analyzer connections

4. Configuration

Most required drivers are included in the myDLTS installer, and are configured automatically, however, to allow for measurements with high sampling rate (above 54 kSa) impedance analyzer's "Local data server" needs to be installed. Said server is a part of the LabOne™ package and can be downloaded from manufacturer's website.

The myDLTS application can be used as a basic measurement browser with no additional configuration. To disable browser mode and to enable measurements, see subchapter 4.5.

To configure the application, select "Settings" in the main window, a new window with settings will open. Following configuration tabs are available:

- MFIA
- Temperature
- Source Meter
- Defaults
- Other

The myDLTS application can be used as a basic measurement browser with no additional configuration. To disable browser mode and to enable measurements, see section Reader mode in subchapter 4.5 "Other".

4.1. MFIA

This tab contains Impedance analyzer's address and checkboxes for compensation and device shutdown.

Address

Device's address in form of serial number (*DEV1234*) for low sampling rates or full IP address (e.g., *127.0.0.1:8004::DEV1234*) for use with "Local data server" – high sampling rates. A sufficient connection bandwidth for sampling rates higher than 54 kSa can be only achieved via gigabit ethernet – either with a direct connection or with local network. Devices that are connected to the PC can be listed using "Scan" button.

Warning: When using "Local data server" make sure that LabOne™ GUI is running. It might be necessary to connect your device in the LabOne™ GUI before connecting it to the myDLTS application.

Use user compensation

If selected, user compensation of the measurement rig's response will be used during measurements.

Safely shut down on exit

If selected, a "Shut down" command will be sent to the MFIA before the application is closed.

4.2. Temperature

This tab contains both universal (PID parameters and stabilization rates) and device specific settings of the temperature controller. To set your device, select the corresponding tab. Device specific settings such as VISA name, sensor definitions and control parameters are defined separately for each type of device.

Note: If only one temperature sensor is available, use it for all three definitions. See chapter 3 Hardware, to learn more about the purpose of each sensor.

4.3. Source Meter

A source meter is an optional equipment, that is not necessary to perform DLTS measurements. If such device is available, I-V measurements can be performed complimentarily to the DLTS ones.

Similarly, to temperature control settings, to configure the source meter, select respective tab and provide device specific settings such as VISA name.

4.4. Defaults

This tab gathers all measurement parameters, that are used as the defaults for newly created measurements.

4.5. Other

This tab gathers all additional settings, necessary for correct operation of the application:

Enable OriginLab

If the Origin application is installed on your machine, myDLTS can export all measurement data to your Origin projects. To enable this integration, select the checkbox.

Reader mode

The application can be used to browse measurement data without the need to connect any hardware to the PC. This feature can be useful when your workflow involves separate computers for experiments and for data processing. By default, myDLTS application is configured with Reader mode enabled in order not to generate unnecessary errors when used without any hardware. To enable measurements, simply deselect the checkbox.

Tip: You can still browse your measurements even if the reader mode is disabled. If no hardware is available, a dialog window indicating connection problems will appear – ignore those warnings.

5. Main window of the myDLTS application

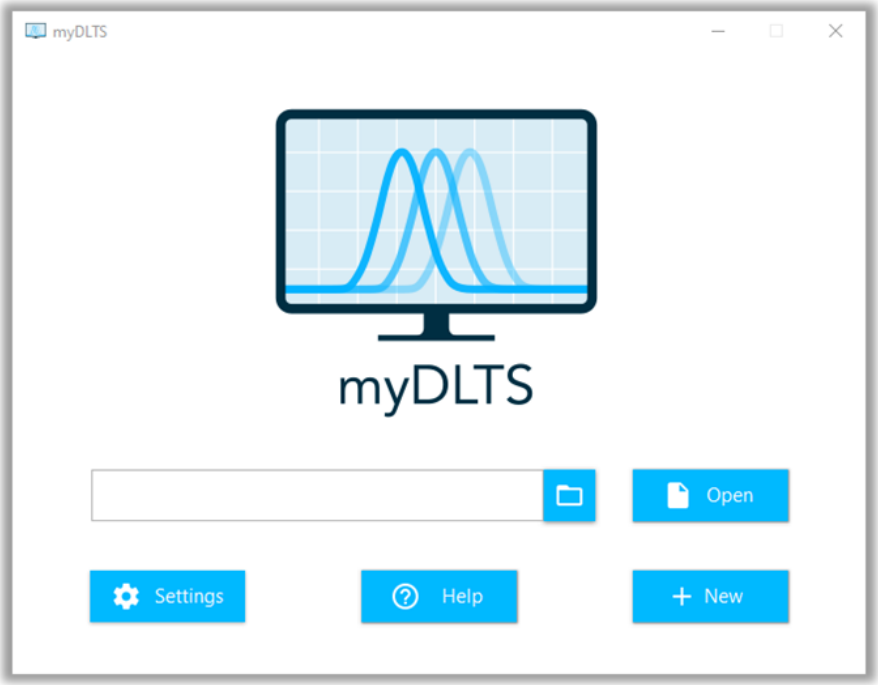

Fig. 2 Screen capture of the main window of the myDLTS application

The main window of the application contains four buttons and one text box:

- Settings button – opens settings window described in the previous chapter.
- Help button – opens file with this user manual.
- New button – opens session creator window.
- Open button – opens existing session file.
- Path box – allows user to enter path of an existing session file.
  Tip: the path can be also entered by drag&dropping or by browsing.

6. Session handler

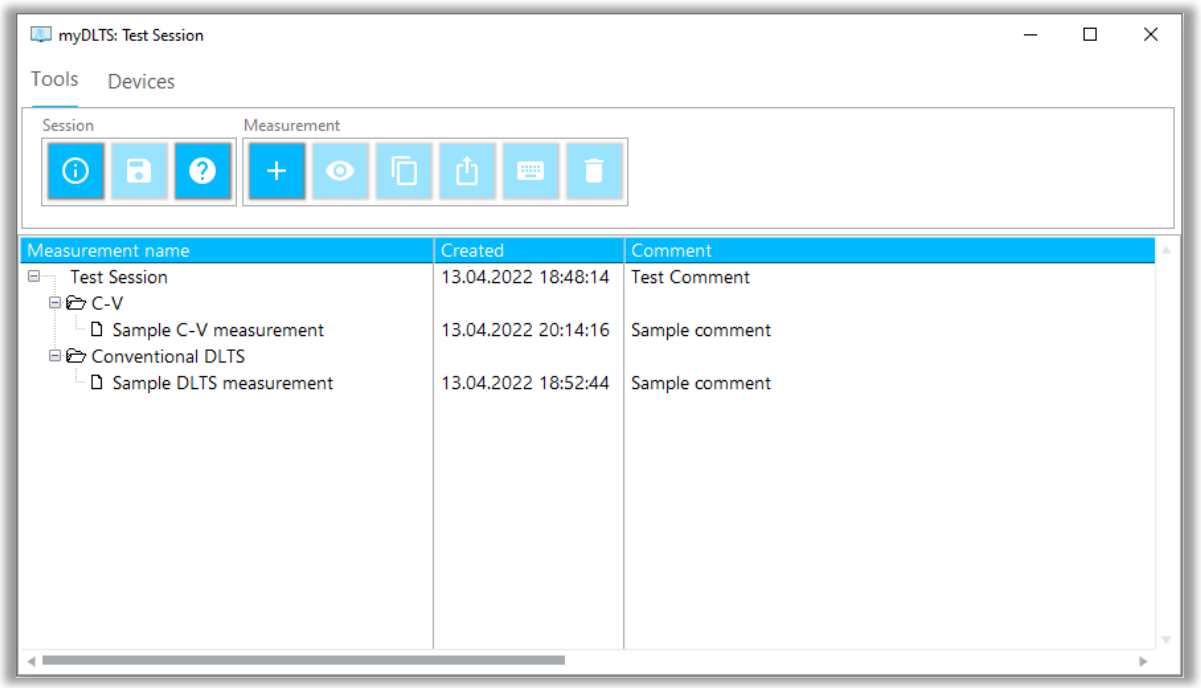

Fig. 3 Screen capture of the session handler window

Session handler's purpose is to manage measurements within the session. The window consists of two sections:

a) Ribbon – gathers all the operations you can perform to interact with the application. Operations are divided into two tabs:
   - Tools – lists a series of buttons, which can be used to:
     - display information about the session,
     - save the session file,
     - display user manual,
     - create a new measurement,
     - view an existing measurement,
     - create a new measurement, by copying presets from an existing one,
     - export measurement data,
     - modify name or comment of an existing measurement,
     - delete measurement.
   - Devices – enables basic interactions with hardware, such as:
     - establishing connection and disconnecting,
     - displaying cryostat temperature,
     - modifying cryostat temperature setpoint.

b) Measurement list – gathers all measurements performed in the session, displaying measurement name, creation time and comments. Measurements are grouped by measurement type and sorted chronologically.

7. I-V measurement

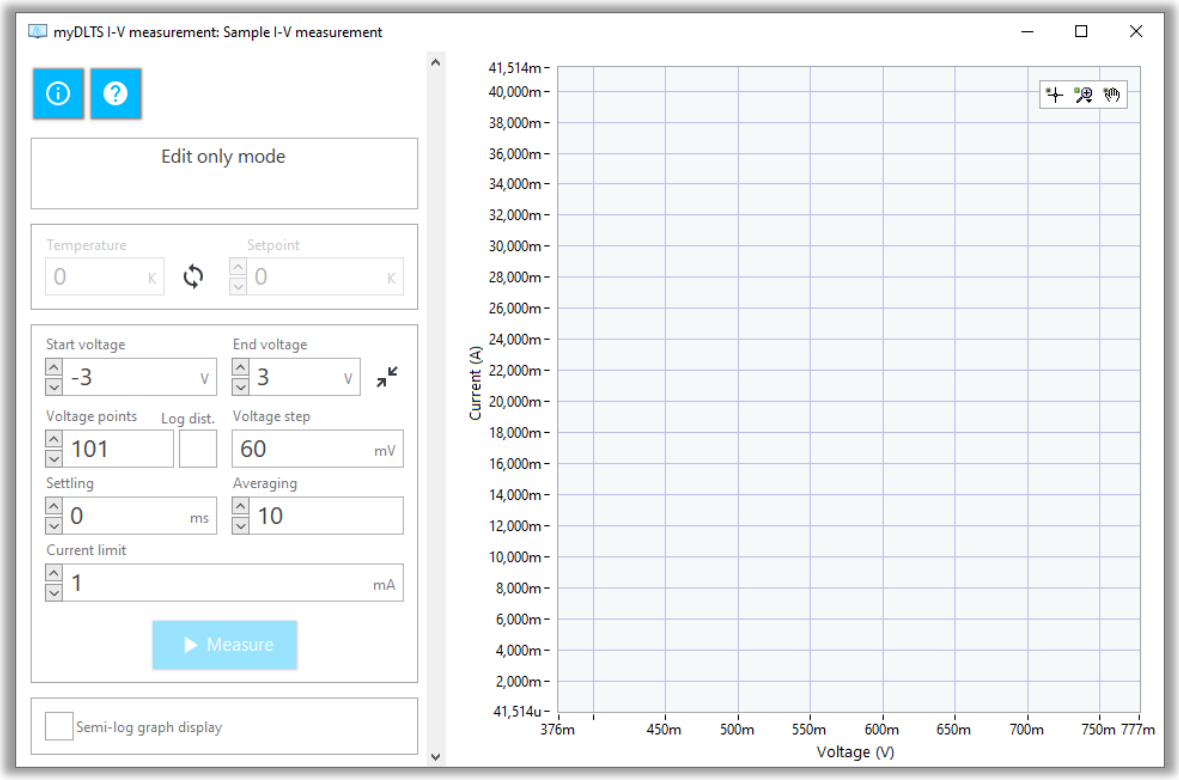

Fig. 4 Screen capture of the I-V measurement window

The I-V measurement window is divided into two sections:

- Left section gathers measurement parameters and measurement control buttons:
  - First row gathers buttons that allow to display information about the measurement, open user manual and export measured data.
  - Second box displays status of the measurement.
  - Third box is used to control temperature – if temperature controller is connected current reading of the sample sensor is displayed and new setpoint of a specified value can be applied. If the controller is not connected a "Connect to temperature controller" button can be used to establish connection with the device.
  - Fourth box gathers parameters of the voltage sweep and current limit. Voltage limits can be swapped using the "Swap Start and End Voltage" button. The "Voltage step" is calculated from the "Voltage points number". Measurement takes place after using the "Measure" button.
    Warning: if the measurement was already performed, the text on the button changes to "Remeasure". Using this button will overwrite current measurement with a new one.
  - Fifth box can be used to change the display form of the graph from linear to semi-logarithmic.
- Right section consists of a graph displaying results of the I-V measurement.

8. C-V measurement

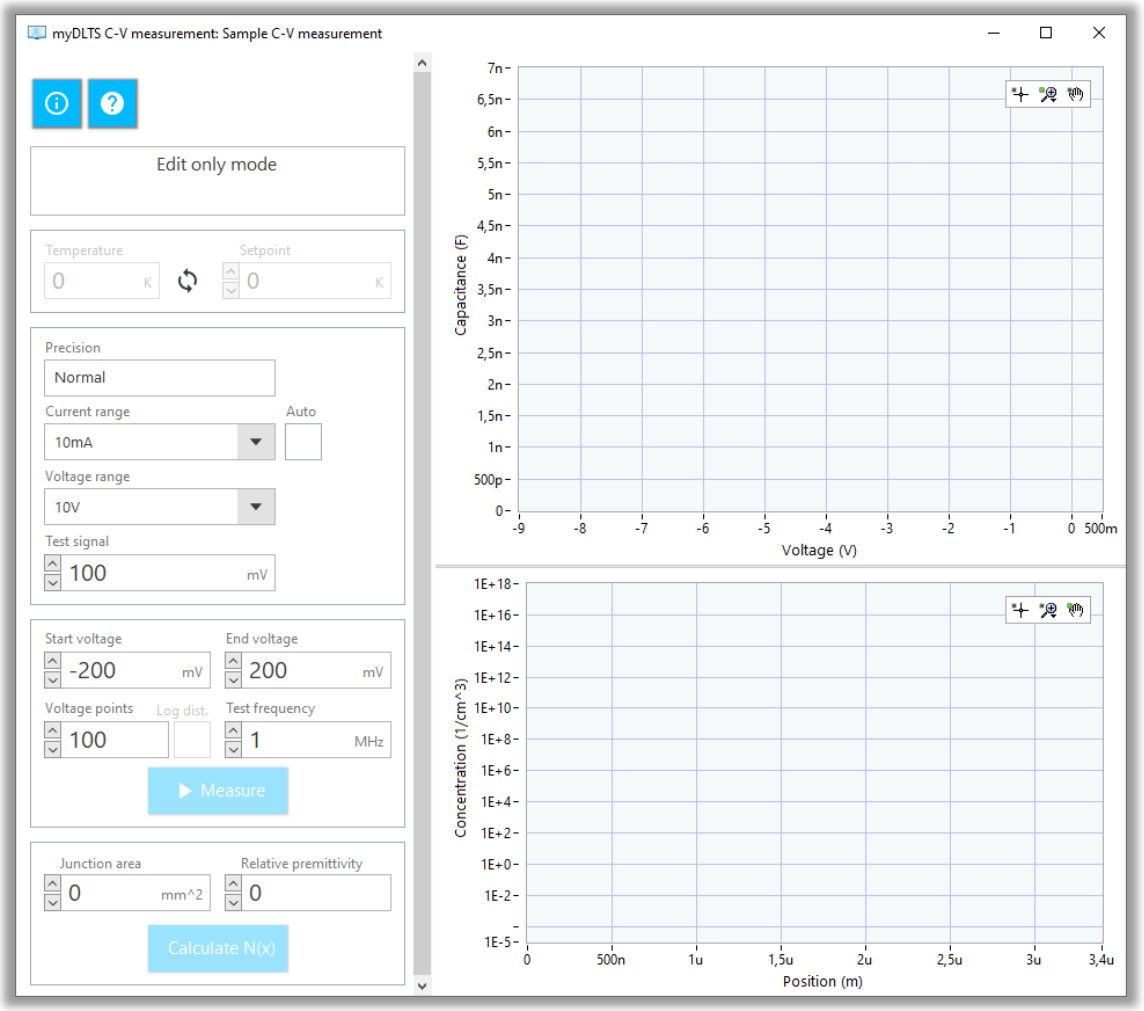

Fig. 5 Screen capture of the C-V measurement window

The C-V measurement window is divided into two sections:

- Left section gathers measurement parameters and measurement control buttons:
  - First row gathers buttons that allow to display information about the measurement, open user manual and export measured data.
  - Second box displays status of the measurement.
  - Third box is used to control temperature – if temperature controller is connected current reading of the sample sensor is displayed and new setpoint of a specified value can be applied. If the controller is not connected a "Connect to temperature controller" button can be used to establish connection with the device.
  - Fourth box gathers basic parameters of the impedance analyzer module of the MFIA: precision, current and voltage ranges, and test voltage.
  - Fifth box gathers parameters of the measurement: DC voltage limits, number of voltage points and frequency of test voltage. Measurement takes place after using the "Measure" button.

Warning: if the measurement was already performed, the text on the button changes to "Remeasure". Using this button will overwrite current measurement with a new one.
Warning: Test voltage is applied "on top" of provided DC voltage limits. Always make sure that sum of those voltages is within voltage range of the impedance analyzer.

- Sixth box is used for calculation of carrier concentration. Calculation is performed after using the "Calculate N(x)" button or automatically if junction area and relative permittivity were provided prior to performing the measurement.

- Right section consists of two graphs displaying results of C-V measurement and concentration profile calculation.

9. DLTS measurement

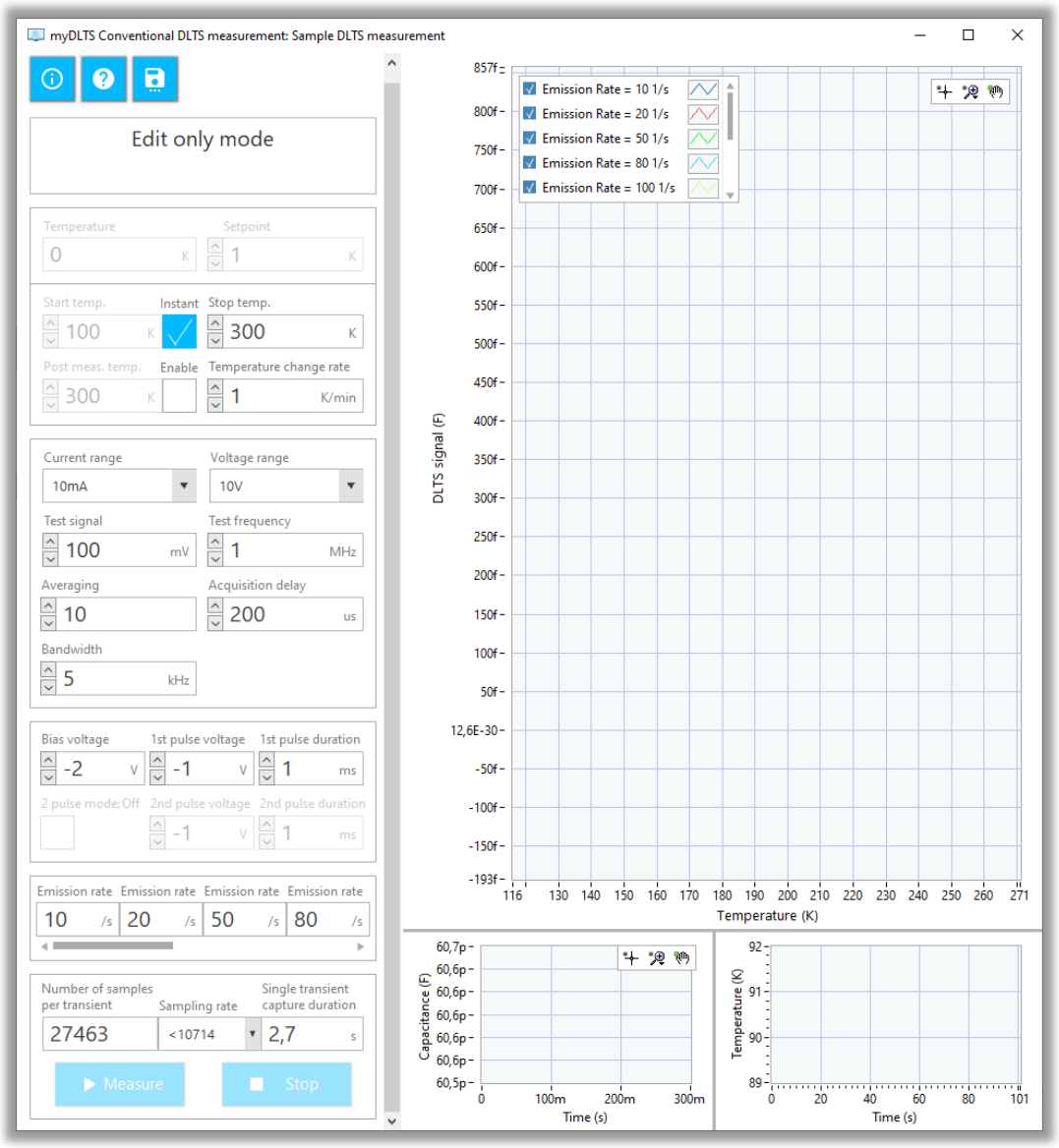

Fig. 6 Screen capture of the DLTS measurement window

The Conventional DLTS measurement window is divided into two sections:

- Left section gathers measurement parameters and measurement control buttons:
  - First row gathers buttons that allow to display information about the measurement, open user manual, save parameters as a preset and export measured data.
  - Second box displays status of the measurement.
  - Third box is used to control temperature – current reading of the sample sensor is displayed and new setpoint of a specified value can be applied. The temperature limits of the measurement and temperature change rate can be set. Using the "Instant" function will copy current sensor reading to start temperature field. If you wish to change the temperature setpoint automatically after the measurement is finished, provide the setpoint in the "Post meas. temp." field after ticking its "Enable" checkbox.

- Fourth box gathers basic parameters of the impedance analyzer module of the MFIA: current and voltage ranges, test voltage, test frequency, averaging, acquisition delay (the delay between the end of the voltage pulse and start of the acquisition) and filter bandwidth.
- Fifth box gathers parameters of biasing voltage and depolarizing pulses' voltages and length for first and second pulse (if enabled).
  Warning: Test voltage is applied "on top" of provided biasing voltage. Always make sure that sum of those voltages is within voltage range of the impedance analyzer.
  Note: Two pulse functionality has not been implemented yet
- Sixth box lists all emission rates to use during the measurement. To add new value simply overwrite an empty (greyed out) value at the end of the list. To add a new value before an existing value, use Right Mouse Click > Insert Element Before. To delete an existing value, use Right Mouse Click > Delete Element.
  Warning: High emission rates require higher sampling rates to mitigate noise.
- Seventh box displays expected duration of a measured transient (both in terms of time and number of samples) based on selected sampling rate. Using the "Measure" button will cause the measurement process to start (start temperature will be applied to setpoint and when temperature reading will satisfy it, pulse generator and data acquisition will start). Using the "Stop" button will cause the application to abort measurement.
  Warning: If a measurement was already performed, the text on the button changes to "Remeasure". Using this button will overwrite current measurement with a new one.

- Right section consists of three graphs displaying results of DLTS measurement, captured capacitance transient and temperature changes.

10. LDLTS measurement (capacitance transient capture)

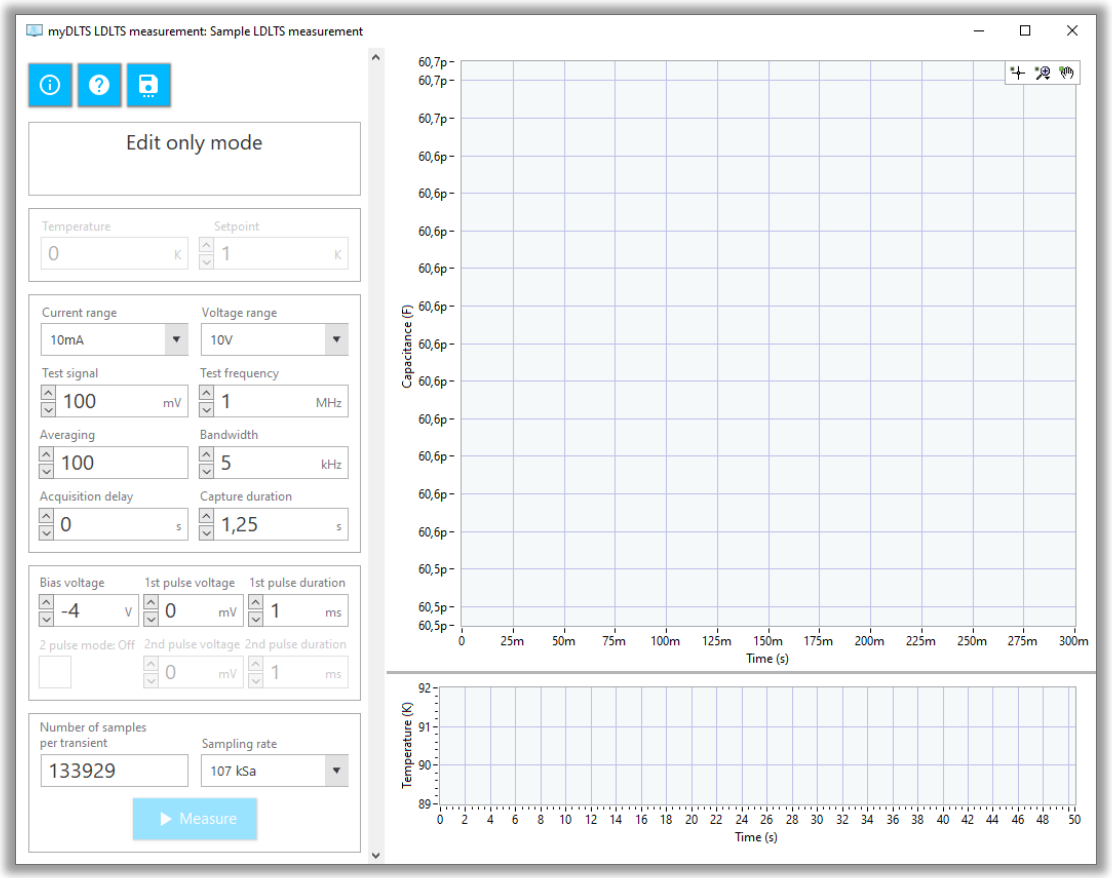

Fig. 7 Screen capture of the LDLTS measurement window

The Laplace DLTS function is used to capture capacitance transient, which can later be processed with external software. The window is divided into two sections:

- Left section gathers measurement parameters and measurement control buttons:
  - First row gathers buttons that allow to display information about the measurement, open user manual, save parameters as a preset and export measured data.
  - Second box displays status of the measurement.
  - Third box is used to control temperature – current reading of the sample sensor is displayed and new setpoint of a specified value can be applied.
  - Fourth box gathers basic parameters of the impedance analyzer module of the MFIA: current and voltage ranges, test voltage, test frequency, averaging and filter bandwidth, as well as acquisition parameters: delay (the delay between the end of the voltage pulse and start of the acquisition) and duration.
  - Fifth box gathers parameters of biasing voltage and depolarizing pulses' voltages and length for first and second pulse (if enabled)
    Warning: Test voltage is applied "on top" of provided biasing voltage. Always make sure that sum of those voltages is within voltage range of the impedance analyzer.
    Note: Two pulse functionality has not been implemented yet

- Sixth box displays expected number of samples (data points) to be captured, based on selected sampling rate. Using the “Measure” button will cause the measurement process to start (start temperature will be applied to setpoint and when temperature reading will satisfy it, pulse generator and data acquisition will start). Using the “Stop” button will cause the application to abort measurement.
  Warning: If a measurement was already performed, the text on the button changes to “Remeasure”. Using this button will overwrite current measurement with a new one.

Right section consists of two graphs, displaying captured capacitance transient and temperature changes.

11. Using the myDLTS application

The application can be used in two modes: to browse previous measurements or to perform measurements. For browsing, neither impedance analyzer, nor temperature controller need to be connected to the PC. When using an application installation, which settings have been already configured to connect to said devices, the application will try to establish those connections. It is possible to enter a "display/edit only" mode by canceling the connection attempts.

To perform a measurement, turn on the temperature controller and the impedance analyzer. If the application is configured to use the "Local data server" (see Configuration section), remember to use the LabOne™ GUI to connect to the impedance analyzer first. The myDLTS application will trigger its connection process when necessary.
Tip: It is not necessary to power on the devices before starting the application. Connection process is triggered every time a measurement window is opened from the session handler.

11.1. Creating a new session

To create a new session, open the myDLTS application. In the main window click "New", a dialog window of a Session creator shown in Fig. 8 will appear. Enter session name, author, comments, and desired session file path. You can choose between binary and text-based structure of the session file. Click "Apply" to confirm.
Tip: You can enter the path by typing, browsing, or drag&dropping. By default, browsing starts at the location a last file that was used in the application.
Note: For more information about the structure of the .myDLTS file see chapter 13.

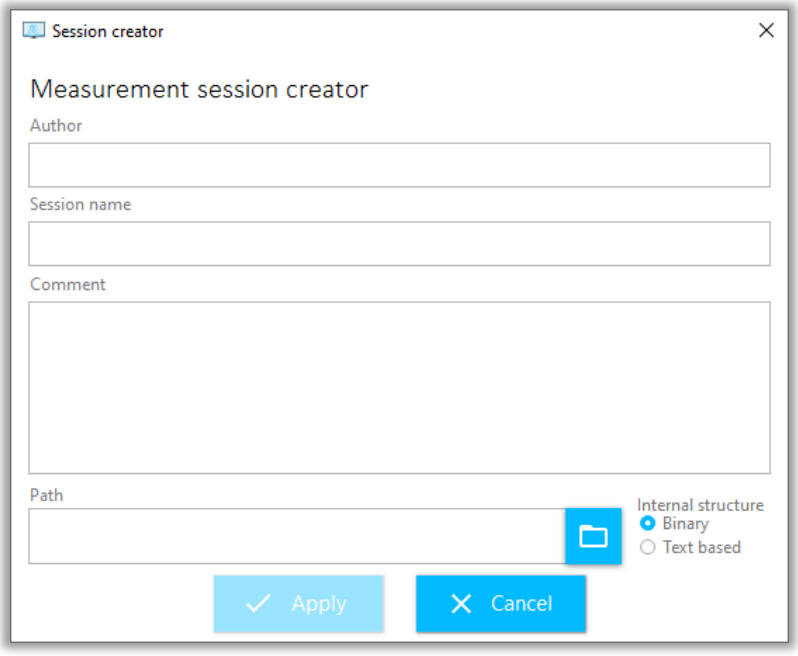

Fig. 8 Screen capture of the session creator dialog window

11.2. Opening an existing session

A session file can be opened in two ways: from inside the application or directly from the file explorer of the OS.

Opening session from inside the myDLTS application
To open a session file, in the main window of the application (Fig. 2), in the path box enter the path of the file you want to open and then click "Open".
Tip: You can enter the path by typing, browsing, or drag&dropping. By default, browsing starts at the location a last file that was used in the application.

Opening session from the OS
During installation, myDLTS is registered as a default application to open all *.mydlts session files. You should be able to open the session file by double-clicking or by choosing the myDLTS application from "Open with" context menu.

11.3. Creating new measurements

To create a new measurement, in the session handler window (Fig. 3) click the "New measurement" button, a Measurement creator dialog window, shown in Fig. 9, will appear. Select desired measurement type from the list and enter a measurement name and comments. Click "Apply" to confirm.

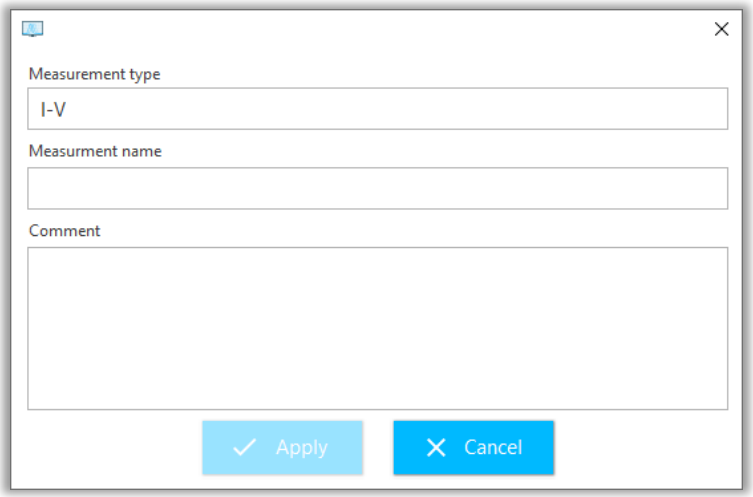

Fig. 9 Screen capture of the measurement creator dialog window

11.4. Viewing an existing measurement

To view an existing measurement, select the desired measurement from the list in the session handler, then click the "View" button in the "Measurement" group. You can also simply double-click the desired measurement.

11.5. Creating a new duplicate measurement

To create a new measurement with parameter preset copied from an existing one, select the parent measurement from the list in the session handler, then click the "Create a new measurement and copy properties from existing one" button. A dialog window similar to the one visible in Fig. 9 will appear. Enter a measurement name and comments. Click "Apply" to confirm.

11.6. Exporting measurement data from Session handler

To export measurement data, select the desired measurement from the list in the session handler, then click the "Export" button in the "Measurement" group. For more information see chapter 12.

Note: The "Export" button is also available in the measurement window if the measurement has succeeded.

11.7. Changing name of comment of a measurement.

To modify the name or the comment of a measurement, select the desired measurement from the list in the session handler, then click the "Rename measurement" button in the "Measurement" group. A dialog window will appear. Make desired changes and click "Apply."

11.8. Deleting measurements from a session

To delete a measurement, select the desired measurement from the list in the session handler, then click the "Delete measurement" button in the "Measurement" group.

11.9. Performing a I-V measurement

Note: I-V measurements are possible only if a source meter is available and configured.

A screen capture of the C-V measurement window is shown in Fig. 4.

1. Create or open a I-V measurement.
2. If desired, connect to temperature controller (by default the application does not initiate connection to the temperature controller). If no connection has been established prior to current measurement, you can manually trigger it by clicking "Connect Temperature Controller" button. To change temperature setpoint, enter desired value in the setpoint field, then click "Apply".
   Note: If a I-V measurement is performed without connection to temperature controller, a value of 0 K is stored as the temperature of the measurement.
3. Enter sweep parameters (voltage limits, number of data points, settling time and averaging) and current limit.
4. Trigger the measurement by clicking the "Measure" button. Results will be saved to a temporary location.
   Warning: If a measurement was already performed, the text on the button changes to "Remeasure". Using this button will overwrite current measurement with a new one.
5. Close the I-V measurement window. Click "Save session file" in the "Session" group of the session handler to save all data.

11.10. Performing a C-V measurement

A screen capture of the C-V measurement window is shown in Fig. 5.

1. Create or open a C-V measurement.
2. If desired, connect to temperature controller (by default the application does not initiate connection to the temperature controller). If no connection has been established prior to current measurement, you can manually trigger it by clicking "Connect Temperature Controller" button. To change temperature setpoint, enter desired value in the setpoint field, then click "Apply".
   Note: If a C-V measurement is performed without connection to temperature controller, a value of 0 K is stored as the temperature of the measurement.
3. Enter basic impedance analyzer's parameters: precision, current and voltage ranges, test signal voltage.
4. Enter measurement parameters: voltage limits, number of voltage points, test signal frequency.

Warning: Test voltage is applied "on top" of provided DC voltage limits. Always make sure that sum of those voltages is within voltage range of the impedance analyzer.

5. Trigger the measurement by clicking the "Measure" button. Results will be saved to a temporary location.
   Warning: If a measurement was already performed, the text on the button changes to "Remeasure". Using this button will overwrite current measurement with a new one.
6. Enter junction area and relative permittivity, then click "Calculate N(x)", to calculate carrier concentration profile. Results will be saved to a temporary location.
   Tip: If junction area and relative permittivity are provided before triggering the measurement, calculation is triggered automatically.
7. Close the C-V measurement window. Click "Save session file" in the "Session" group of the session handler to save all data.

11.11. Performing a DLTS measurement

A screen capture of the DLTS measurement window is shown in Fig. 6.

1. Create or open a DLTS measurement.
2. If desired change temperature setpoint by entering desired value in the setpoint field, then clicking "Apply". Enter temperature limits and temperature change rate. You can select "Instant" option to automatically copy current sensor reading as a start temperature.
3. Enter basic impedance analyzer's parameters: current and voltage ranges, test signal voltage and frequency, number of capacitance transients to average, acquisition delay (delay after trigger) and filter bandwidth.
4. Enter generator parameters: bias voltage, pulse voltages and lengths. You can enable two pulse mode by selecting "Enable 2nd pulse" – in this mode capacitance transients are captured for both sets of pulses, then the difference between them is further analyzed by so called rate window algorithm.
   Warning: Test voltage is applied "on top" of provided biasing voltage. Always make sure that sum of those voltages is within voltage range of the impedance analyzer.
5. Enter desired emission rates to be used by so called rate window algorithm.
   Tip: To add new value simply overwrite an empty (greyed out) value at the end of the list. To add a new value before an existing value, use Right Mouse Click > Insert Element Before. To delete an existing value, use Right Mouse Click > Delete Element.
   Warning: High emission rates require higher sampling rates to mitigate noise.
6. Check resulting number of samples per transient and acquisition time. If necessary, change sampling rate and parameters from previous points.
7. Trigger the measurement by clicking the "Measure" button. Data acquisition will begin once the start temperature is met. Results will be saved to a temporary location.
   Warning: If a measurement was already performed, the text on the button changes to "Remeasure". Using this button will overwrite current measurement with a new one.
   Tip: It is possible to save parameters without triggering the measurement by clicking "Save parameters for a future measurement" button. Such preset can be created even if no device is connected to the PC.

8. Close the DLTS measurement window. Click "Save session file" in the "Session" group of the session handler to save all data.

11.12. Performing an LDLTS measurement

Note: The LDLTS measurement feature can be only used to capture a capacitance transient – the data must be processed using an external software.

A screen capture of the LDLTS measurement window is shown in Fig. 7.

1. Create or open a DLTS measurement.
2. If desired change temperature setpoint by entering desired value in the setpoint field, then clicking "Apply".
3. Enter basic impedance analyzer's parameters: current and voltage ranges, test voltage, test frequency, averaging and filter bandwidth, as well as acquisition parameters: delay and duration.
4. Enter generator parameters: bias voltage, pulse voltages and lengths. You can enable two pulse mode by selecting "Enable 2nd pulse" – in this mode capacitance transients are captured for both sets of pulses, then the difference between them is further analyzed by so called rate window algorithm.
   Warning: Test voltage is applied "on top" of provided biasing voltage. Always make sure that sum of those voltages is within voltage range of the impedance analyzer.
5. Check resulting number of samples per transient for a given acquisition time. If necessary, change sampling rate and parameters from previous points.
6. Trigger the measurement by clicking the "Measure" button. Data acquisition will begin once the start temperature is met. Results will be saved to a temporary location.
   Warning: If a measurement was already performed, the text on the button changes to "Remeasure". Using this button will overwrite current measurement with a new one.
   Tip: It is possible to save parameters without triggering the measurement by clicking "Save parameters for a future measurement" button. Such preset can be created even if no device is connected to the PC.
7. Close the LDLTS measurement window. Click "Save session file" in the "Session" group of the session handler to save all data.

12. Data export

You can export the measured data while viewing the results in the measurement window or form the session handler by selecting the desired measurement from the list, then clicking the "Export" button.

There are two ways in which you can export data: to text based *.dat file, or directly to an Origin sheet (provided that the Origin application is installed, and myDLTS application is configured to use it – see chapter 4.5).

Exporting to a text based file

You can choose this type of export for every type of measurement and every configuration of myDLTS application.

When you click the "Export to *.dat file" button, a dialog window, shown in Fig. 10, will appear. Enter a desired path for the export file, then confirm by clicking "Export".

Tip: You can enter the path by typing, browsing, or drag&dropping. By default, browsing starts at the location of the last file that was used in the application.

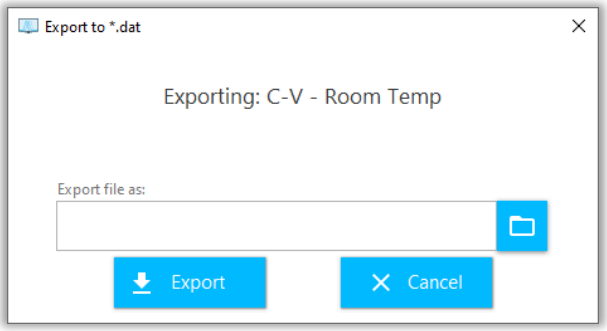

*Fig. 10 Screen capture of the Export to *.dat dialog window*

Exporting to an Origin sheet

When you click the "Export to Origin" button, a dialog window, shown in Fig. 11, will appear. You can choose to enter a path of an existing or new Origin project or select "Export to current Origin instance" to use an Origin project that is opened in the background (if no project is opened, a new empty one will be created).

If the path is provided, you can select "Save and exit after export" to save the project and close the Origin application.

Select parameters to be placed in the "Comment" row of the sheet.

Confirm by clicking "Export".

Tip: To add a new parameter simply overwrite (select from the list) an empty (greyed out) value at the end of the array. To add a new parameter before an existing value, use Right Mouse Click > Insert Element Before. To delete an existing parameter, use Right Mouse Click > Delete Element.

Note: During export folder structure of "myDLTS Export/<Session name>" is created. The data is exported to a sheet named after the measurement name, in the workbook named after the measurement type.

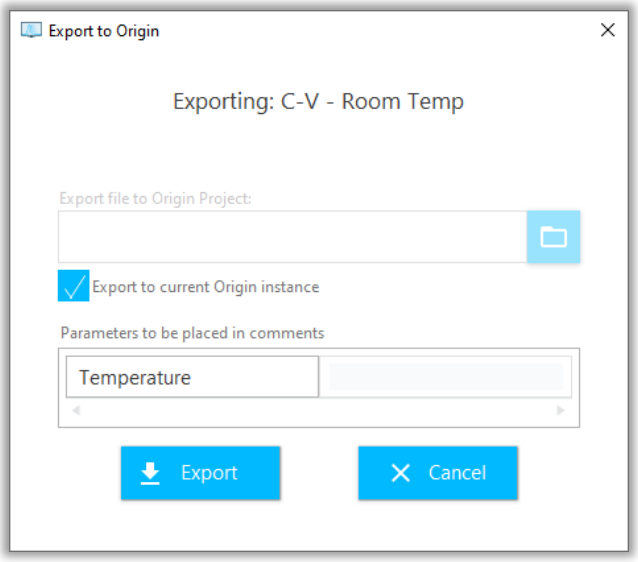

Fig. 11 Screen capture of the Export to origin dialog window

13. .myDLTS file format

Warning: Do not manually modify the .myDLTS file's contents, as it may lead to data corruption. The following information is provided only to better explain how the application works and to enable manual data extraction if necessary.

13.1. .myDLTS file structure

The .myDLTS file is based on a ZIP folder file format and it can be opened with any ZIP browser. Inner structure of the file follows the example:

- .myDLTS file root
  - session_properties.xml
  - index.xml
  - C-V
    - <Measurement tag 1>
      - C-V.bin (or C-V.dat)
    - <Measurement tag 2>
      - C-V.bin (or C-V.dat)
    - …
  - DLTS
    - <Measurement tag n>
      - DLTS.bin (or DLTS.dat)
    - …
  - …

Information about the session (e.g., session name, session comment, session type (binary or text based), etc.) is stored in the session_properties.xml file, in a computer and human readable text-based form. Information about all the measurements performed in the session, including all parameters at which the measurements took place, and measurement tag is stored in index.xml file.

Results of the measurements in folders specific to the type of the measurement, in subfolders named after the measurement tags. Results can be stored either as binary files, or as text-based files, each having both advantages and disadvantages listed in a table below. Binary files are recommended.

13.2. Binary vs Text based format

Binary Data is saved as a raw capture of data stored in RAM, with no conversions of data types and no additional encoding.		Text based Data is converted to a decimal formatted text, then the text is saved using a common ASCII encoding.	
+	no conversions mean no accuracy loss	–	conversion means some loss in accuracy
+	no conversions result in smaller file sizes	–	conversion and encoding result in larger files
–	no conversions and no standardized encoding mean, that the file cannot be opened by other applications; any attempt to decode data using ASCII produces a string of "random" characters	+	standardized conversion and encoding mean, that the file can be opened by other applications