

Metrel Electrical Safety Manager aMESM for Android devices

Instruction Manual

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2. Android Metrel Electrical Safety Manager - aMESM

2.1. Introduction

The aMESM is the Metrel Electrical Safety Manager running on Android devices. It enables a subset of MESM functionality with some additional features. It enables fast and simple test project data structure file (“project” in the text below) management, a quick overview of already performed tests and a full control over the instrument adapters MI 3143 and MI 3144.

The Application enables the user to send projects with results to the main office before leaving test site and enter and save data to the test instrument by using the smart phones’ keyboard. It enables creation of customer and test location database as well as adding text and pictures, videos or voice records to the specific position in the test structure.

With this application it is possible to use Impedance adapters (IA) MI 3143 and MI 3144 as standalone instruments. The application enables execution of all measurements supported by these two adapters. They are controlled over the BT interface, the manipulation is similar as if would be done over UI of belonging instruments

3. Instrument compatibility and connection set-up

3.1. Compatibility

aMESM is compatible with the following instruments and adapters:

Instruments supported:

- MI 3152
- MI 3152H
- MI 3155
- MI 3325
- MI 3360
- MI 3394
- MI 3102 BT
- MI 3102H BT
- MI 3125 BT
- MI 3288, MI 3280

Adapters supported:

- MI 3143
- MI 3144

The list of supported instruments will be expanded with time.

3.2. Connection set-up

- **MI 3152 / MI 3152H / MI 3155 / MI 3325/ MI 3360 / MI 3394 / MI 3288 / MI 3280**

No special settings are needed since BT is always on.

- **MI 3102 BT, MI 3125 BT**

Make sure BT is initialized. If BT device is not visible, go to setting menu on instrument and try to use INITIAL SETTINGS. This will initialize BT on the instrument.

- **Adapter MI 3143 / MI 3144**

No special settings are needed since BT is always on.

4. Start of aMESM

When starting the aMESM the application opens with one of two dashboards:

- a. **The TDM dashboard:** a Test Data Manager (TDM) for specific models of Metrel's electrical testers.

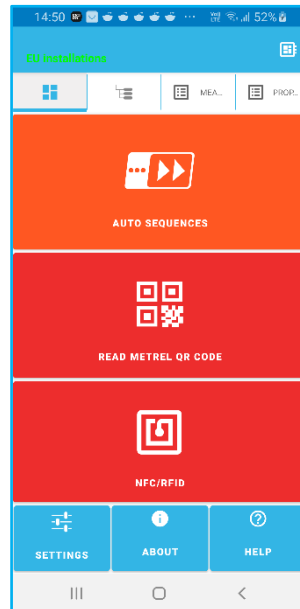


Figure 1 : TDM Dashboard


- b. **The IA dashboard:** a remote User Interface (UI) unit for supported impedance adapters (IA).



Figure 2 : IA dashboard

5. Dashboard selection

The aMESM opens in one of two Dashboard views: the TDM view or in IA view.

The user can switch between these two views by selecting the  icon in the upper right screen corner of the corresponding Dashboard.

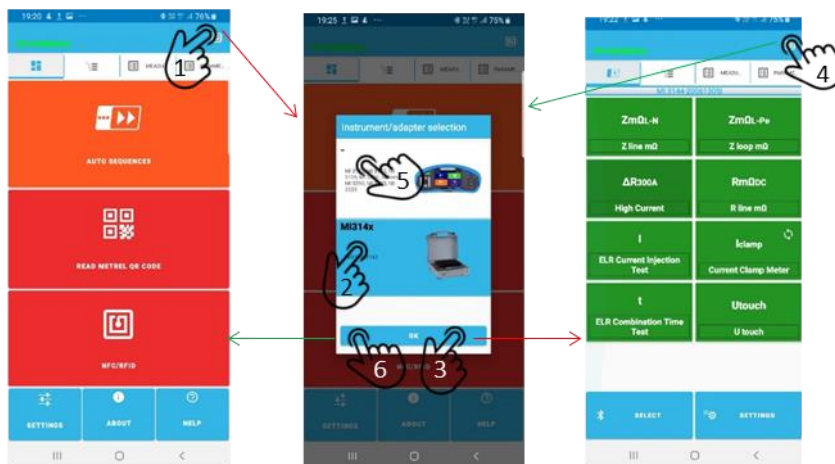




Figure 3 : Dashboard selection

6. Project management

From each dashboard view Project management views can be selected:

- the Tree view by selecting the  tab,
- the Measurement view by selecting the  MEASU... tab and
- the Properties (Test structure parameters) view by selecting the last tab

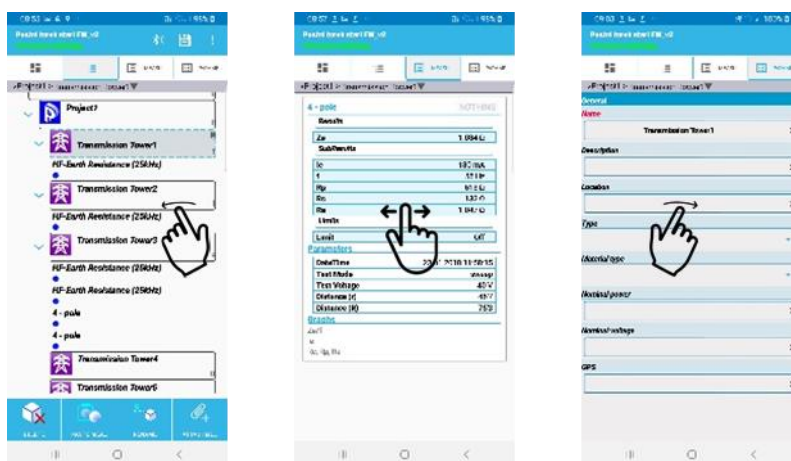


Figure 4 : The Tree, Measurement and Properties view

To switch between the views also swiping can be used.

The organization of each Project Management view is as follows:

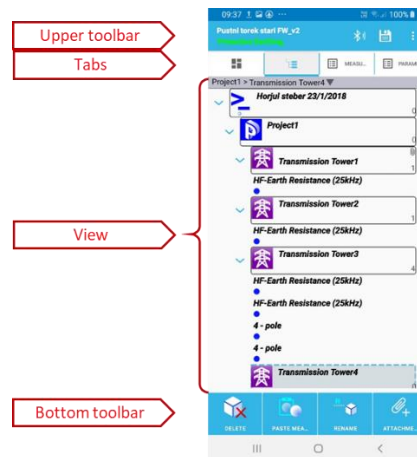


Figure 5 : Toolbars

For the View and Bottom toolbar the same rules apply as for MESM and any new generation instrument, which is **the toolbar icons, the structure element icons and measurement icons are the same and the manipulation rules are the same**. On Android devices in the bottom toolbar the ATTACHMENT button is added which enables the use of the device's camera for capturing photos or videos, microphone to add voice recordings and editor to add notes/comments.

7. Tree view

In Tree view you can:

- Create new projects
- Open existing projects
- Edit projects
- Share/Export/Import projects

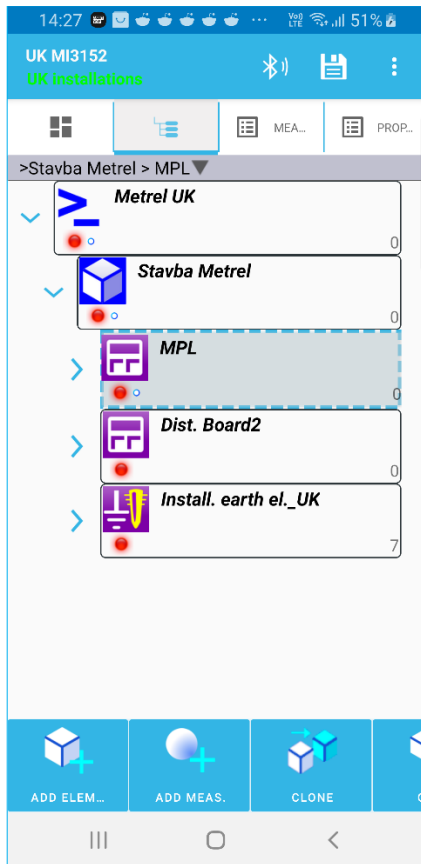


Figure 6 : Tree view

Tree view elements:

1. Project name and scope of work. When there is any change in a project, a red save indicator will show up.
2. Menu to access other parts of the program. Not all icons are shown on every device. It depends on the screen size. Icons that are not shown are hidden under the overflow menu on the right.
3. Screen is divided into three parts/tabs:
 - a. Tree view representing the project structure in the form of tree
 - b. Measurements view (results view)
 - c. Parameters view
 By selecting a tree element, the measurement and the parameter view will change to reflect the parameters and measurements bound to the selected element.
4. Tree view representing a project structure in form of a tree.
5. Toolbar used to manipulate the structure. By swiping left/right you can move between the selected element's measurements and parameters.

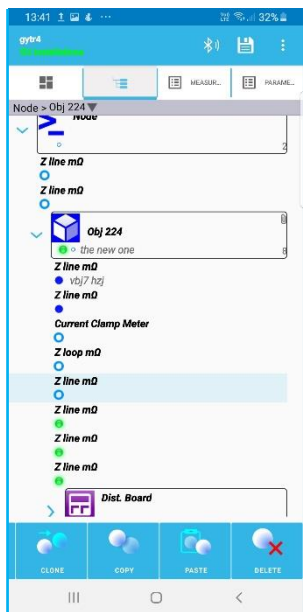


Figure 7: Tree view full view

In tree view projects' structure is presented. By clicking on the arrow symbol on the left of the tree structure element, the tree gets expanded or collapsed.

By selecting an element using a short single click, its measurements, parameters and attachments can be inspected or modified by moving to the appropriate tab.

There are 4 different states possible for measurements:

- Passed (green icon)
- Failed (red icon)
- Finished without status(blue)
- Empty measurement (blue hollow) without results

Below the structure element icon, there are two icons showing if there are failed or empty measurements beneath that element.

7.1. Measurements view

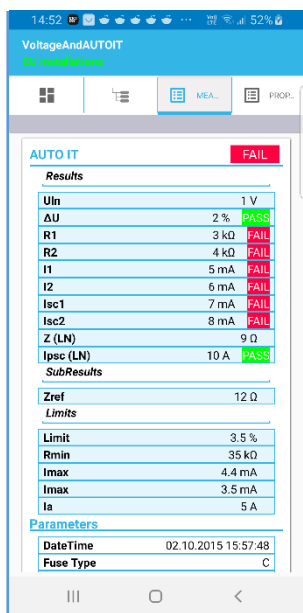
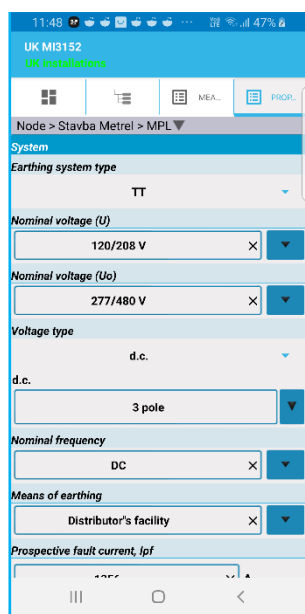


Figure 8: Measurement view

In the measurement view appliance measurement results and parameters can be checked. By clicking on a measurement, an edit dialog will open allowing to manually enter results and parameters. If measurement was downloaded from the instrument editing will be disabled.

By clicking on the measurement, a dialog will open allowing to enter results, parameters and limits. If results are entered the status of the measurement will change. Until the results are entered the measurement is treated as empty and upon uploading it to instrument it will allow to be executed immediately.

7.2. Properties view



In the Properties view, parameters of structure elements can be entered.

Figure 9: Properties view

8. Bottom toolbar

Depending on the type of selected tree element, an appropriate toolbar will open at bottom of the screen. There are different sets of actions available for structure elements and measurements.

8.1. Structure element actions toolbar

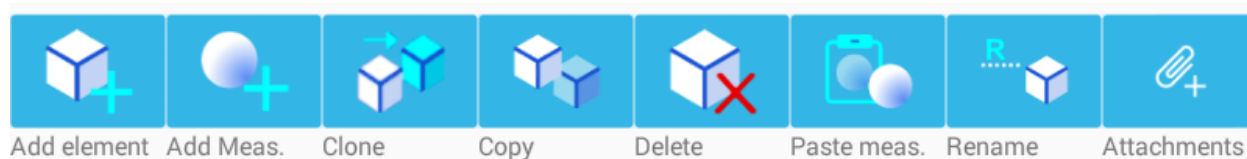


Figure 10: Structure element actions toolbar

The toolbar allows:

- Adding new structure elements
- Adding new measurements
- Cloning structure elements
- Copy/Paste operation
- Deleting measurements
- Renaming elements
- Adding/viewing/manipulating attachments

8.2. Measurement element actions toolbar



Figure 11: Measurement element actions toolbar

When a measurement is selected in the tree view, toolbar actions will change. The measurement toolbar allows:

- Adding new measurements
- Cloning measurements
- Copy/paste operation
- Deleting measurements

9. Working with structure

9.1. Open project

Projects are opened using “Open” from the menu. Projects are saved under directory / aMESM/Projects. The location of this folder depends on the Android device. Usually it is on external storage, but some devices don’t have external storage and they have some internal memory mapped as external storage. This is normally storage that shows up when the phone/tablet is connected to the PC using an USB cable (connection type should not be camera, but MTP or storage – set on the device).

9.2. Work scope selection

Before creating a new project, the Work Scope has to be selected:

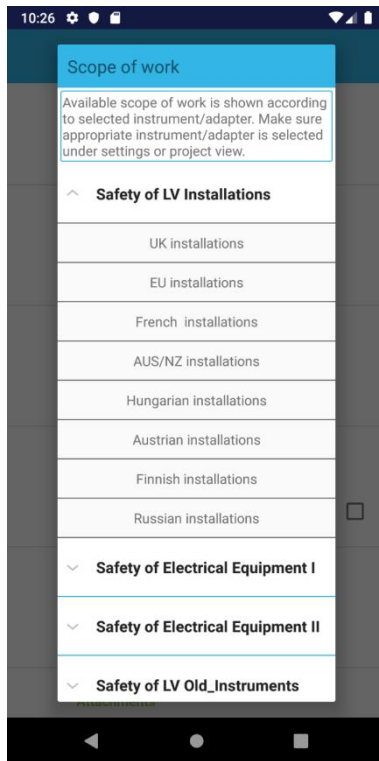


Figure 12: Scope of work menu

According to the type of instrument different work scopes are available:

- electrical safety testers
 - MI 3102, MI 3100, MI 3125
 - Safety of LV old instruments
 - MI 3152, MI 3155
 - Safety of LV installations
- portable appliance testers (Safety of electrical equipment I)
 - MI 3360
 - PAT new instruments
- machine testers (Safety of electrical equipment I)
 - MI 3325
 - Machine, Switchgear and PAT testing + region
- industrial safety testers
- adapters
 - MI 3144/43
 - Safety of LV installations
 - Machine, Switchgear and PAT testing

When creating a new project select a proper work scope that suits the instrument that is going to be used.

9.3. Adding structure elements

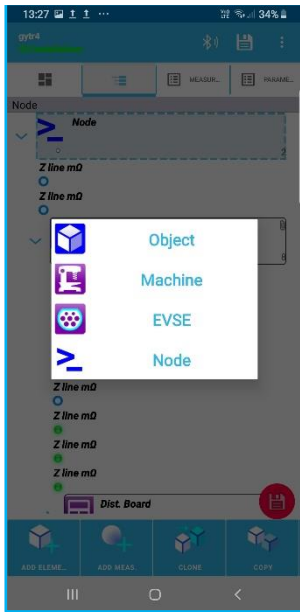


Figure 13: Adding structure elements

Elements can be added by using the “Add element” button. Before adding a new element, you have to select a structure element which will serve as a parent structure element. It will then be possible to add a new structure element (a.k.a. child) below. Depending on the selected work scope different sets of structure elements will be available.

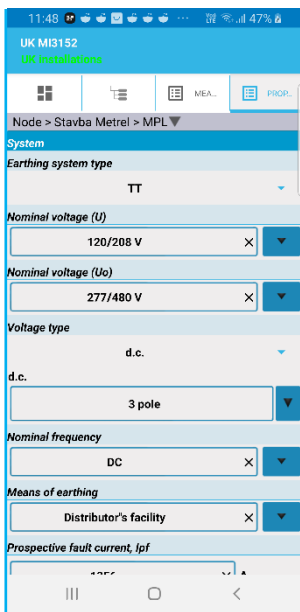
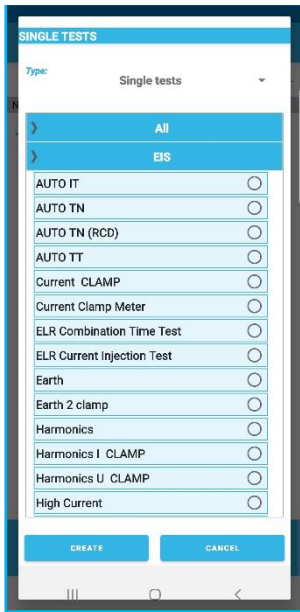


Figure 14: Adding structure elements

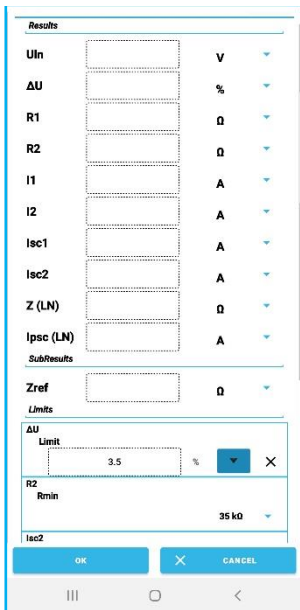
By moving to Adding structure elements tab, selected element parameters can be entered or modified.

9.4. Adding measurements



By selecting “Add measurement”, different measurements can be added to structure elements. Depending on the work scope, different sets of measurements will be available for selection.

Figure 15: Measurement selection



After a measurement is selected, a dialog will open where the user can enter parameters, limits and results. If no results are entered, an empty measurement is created, allowing immediate execution after uploading of the project to the instrument.

Figure 16: Measurement editor

9.5. Modifying tree structure

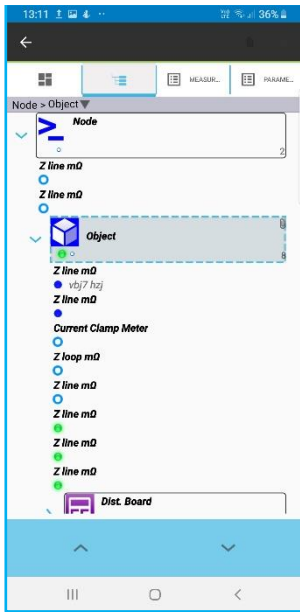


Figure 17: Modifying tree structure

Tree structure can be modified by using the toolbar at the bottom. Comments and attachments can be added to the structure elements.

By using the long press action on a structure element in the tree view an additional toolbar will open allowing to move elements up/down (on same level).

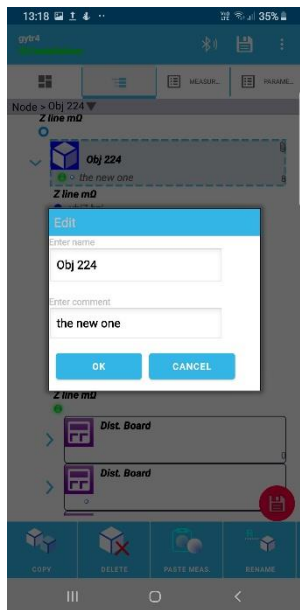


Figure 18: Name change and comment adding

When a structure element is selected and the edit icon is used, the name of the element can be changed and also a comment can be added. The comment is then seen in the tree structure.

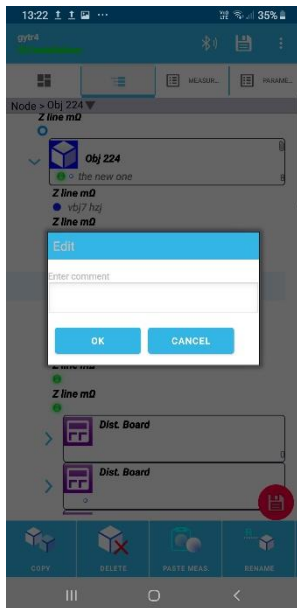


Figure 19: Adding comment to measurement

Measurements can't be renamed, only a comment can be added.

9.6. Adding attachments to a structure element

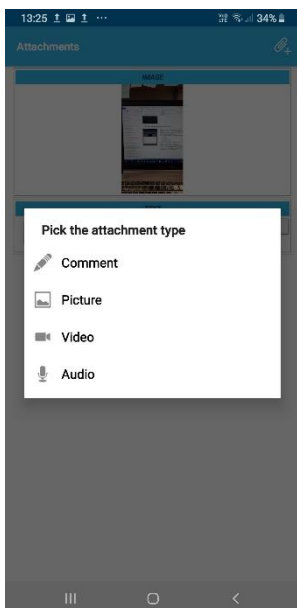


Figure 20: Adding attachments to a structure element

Attachments can be added only to a structure element. Select a structure element and press the Attachment button from the bottom toolbar. The attachment list is opened.

Four different types of attachments can be added.

- Text
- Picture
- Video record
- Sound record

Once an element has attachments, a symbol will appear on the structure element.

Under TDM Dashboard/Settings there is the option Attachments/Picture, where the picture compression factor can be selected. It is recommended to keep the quality as low as possible to have an overall size of attachments low.

10. Import/Export/Share Project

When you want to share a project, you have to export it, so that it can be imported on another device or into MESM software running on the PC. There are different directories created for importing/exporting:

- /aMESM/Imports – for importing
- /aMESM/Export – for exporting

When you want to import projects, the application searches in the import directory and when you want to export, the exported file is placed into the export directory.

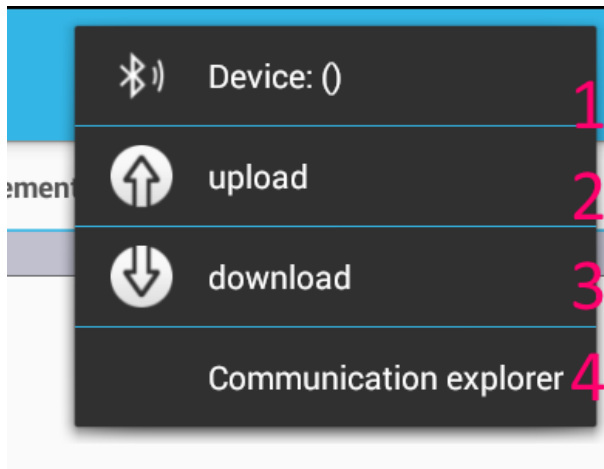
In case you want to share a project, the device offers all applications that are available to share it. Usually sharing options such as BT, Mail, Cloud storage providers, Wi-Fi and others are available.

Exported project has a file ending *.padfx

All exported projects can be opened in PC software MESM.

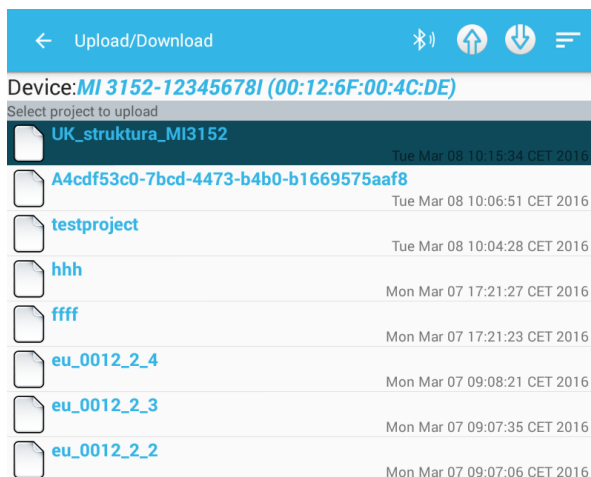
11. Connecting to the instrument

In order to connect to the instrument, BT icon has to be selected in main project window



1. Before projects can be uploaded or downloaded, an instrument has to be selected. Make sure the instrument is turned on so that it can be discovered over BT.
2. To upload the currently opened project select the 2nd option.
3. To download a project from an instrument select the 3rd option.
4. To open the Communication explorer, select the 4th option.

11.1. Communication explorer



If the communication explorer is selected, the following view will be shown, where projects can be uploaded and downloaded.

11.2. Selecting an instrument

By using the BT icon, the instrument we wish to use has to be selected. Once the instrument is selected it will remain selected until a new one is selected. All upload/download operations are going to refer to this selected instrument.

11.3. Downloading from the instrument

By using the download button the active project on the instrument is going to be downloaded. Once downloaded, a dialog will be shown asking if we want to open the project.

11.4. Uploading to the instrument

Before uploading to the instrument, a project has to be selected. The user has to select a project from the list of projects in aMESM and upload it to the instrument.

12. Starting the measurements on the Impedance Adapter

From the IA dashboard, the measurements on Impedance Adapters (IA) can be started.

12.1. IA dashboard

On the IA dashboard a different number of measurements is available:

- four if the MI 3143 is connected and

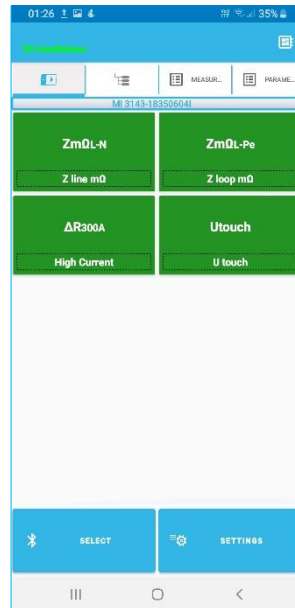


Figure 21 : MI 3143 dashboard

- eight if the MI 3144 is connected (or was the last connected IA in the past)



Figure 22: MI 3144 dashboard

The user has three possibilities to start a measurement:

1. To start a measurement by selecting one of the offered measurement buttons on the dashboard, or
2. to start the measurement from an existing project or
3. always starts the last used measurement.

Always start the last used measurement

This option is for those users, who use only certain measurement and only want to change measurement parameters and measurement execution. This operation modus can be activated by selecting the Settings button in the IA dashboard and activating the “Always start the last used measurement” option:

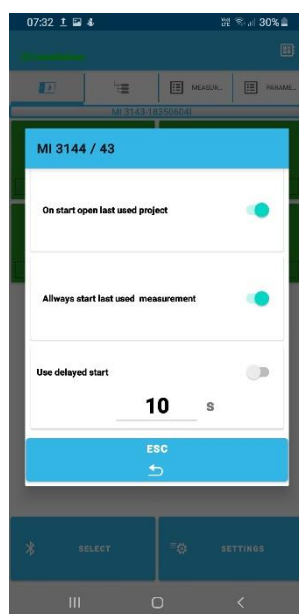



Figure 23: IA set-up window

With this option activated aMESM will not start with one of both dashboards as usually but will directly jump to the “Measurement result viewer” window with the last used measurement opened. If IA is already powered on, the BT connection is established automatically without user intervention.

With “Always start the last used measurement” option activated the user can always continue his measurement activities at the point, where he left off, regardless of the reason for the interruption of previous activities. Only three steps are needed to start a measurement:

1. power on the IA and connect the measurement wires to the tested object.
2. start the aMESM application, or, if already running and “no connection indication” is present, press the CONNECT button.
3. Press the START button to run the measurement.

The user can at any time switch to the TDM mode by pressing the ESC button, which returns him to the dashboard, and changing to the TDM dashboard by selecting the  icon.

Starting a measurement from the IA dashboard

An IA measurement can be started from the IA dashboard. Tap one of the available measurements and the “Measurement result viewer” window will open. In the next step the measurement parameters and limits have to be defined.

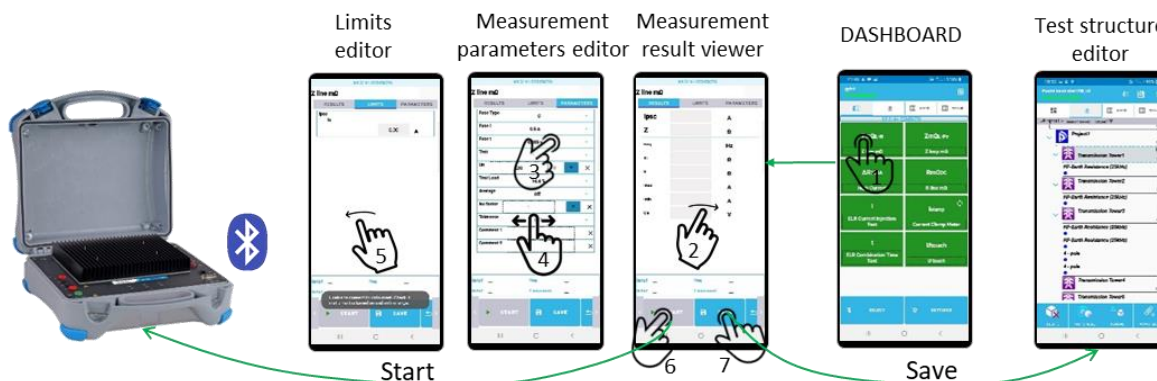


Figure 24 : Starting a measurement from the IA dashboard

With pressing the SAVE button the Tree view of the Project management appears and the results are stored to the selected position in the project. If the project was not opened before, it has to be opened from the list of existing projects or a new one can be created.

After the measurement results are stored the application returns to the “Measurement result view” and the user can perform the next measurement.

Starting a measurement from the Project Management

With swiping or selecting one of three additional views the same functionality of the Project Management functions as described before can be used.

If the “On start open the last used project” is activated the project opened in IA dashboard is different as the “Always load last used project” in TDM mode.

Additionally, from the Measurement view it is possible to start the selected test on the Impedance Adapter.

There are two options:

- If the test was already executed, which is recognised by a full green, red or blue dot in front of the test, then the RETEST button appears.
- If the test was not executed yet, which is recognised by a blue circle in front of the test, then TEST button appears.

When pressing one of those buttons the application immediately establishes a BT connection to the IA (if available and powered on). The Measurement result viewer window is opened, and the user has once again the possibility to change the measurement parameters or just pressing the START button to start the measurement:

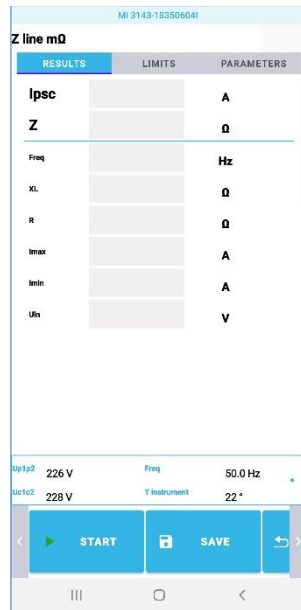


Figure 25: Measurement result viewer window

The blinking blue dot on the right side indicates active BT connection to an IA and the numbers show the monitored values if the IA is already properly connected to the measured object (for example a tested socket outlet).

Immediately after the test is finished the Measurement result window is updated with the measurement results:

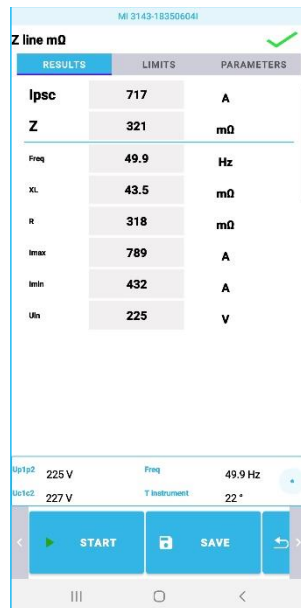


Figure 26: Results of the Z line mΩ measurement

By pressing the SAVE button the Tree view of the Project management appears and the results are stored in the position from where the measurement has been started.

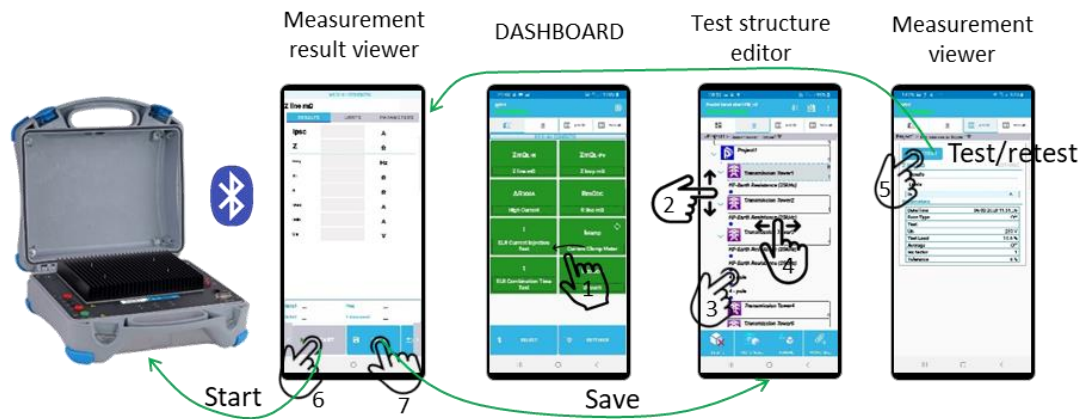


Figure 27: Starting a measurement from the Project Management

13. Running applications

From the TDM dashboard different applications can be started:

- Auto Sequence® viewer
- QR reader
- NFC/RFID reader

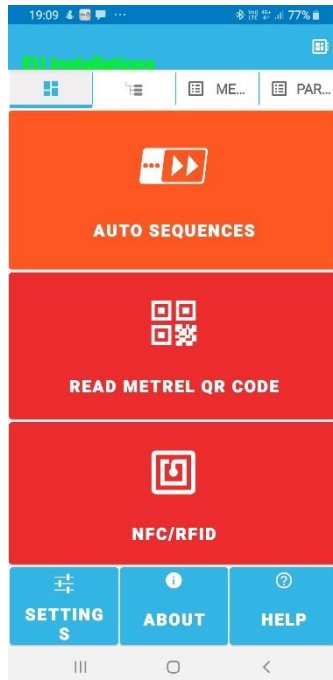


Figure 28: The TDM Dashboard applications

13.1. Auto Sequence® viewer

Auto sequence viewer is used to check auto sequences that are imported to aMESM application and can be inserted in tree structure.

13.2. QR/NFC/RFID

PAT instruments have ability to write results to labels with QR, NFC and RFID tag-s. Using aMESM we can read results and send results back to supported instruments (MI 3360, MI 3394, MI 3325) to search inside the memory organizer and repeat the tests. The NFC and RFID tags or the QR label must be created using the instrument or else they won't be recognized.

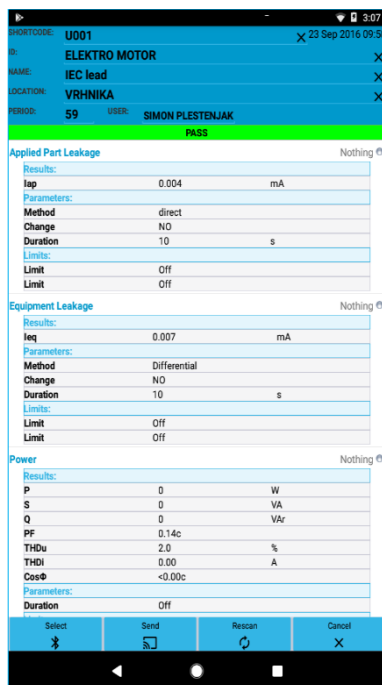


Figure 29: Results of autotest

▪ NFC reader

The mobile phone/tablet must have NFC reader capabilities to be able to read NFC tags. It takes some trial and error to find the exact position of the NFC antenna on the back of the device. If a tag is successfully read, the results are shown, otherwise not.

▪ QR reader

To be able to read QR labels a smart phone/ tablet must be equipped with a camera. The speed of reading depends on the quality of the camera sensor. A higher resolution camera sensor generally means faster reading.

▪ PDF reports

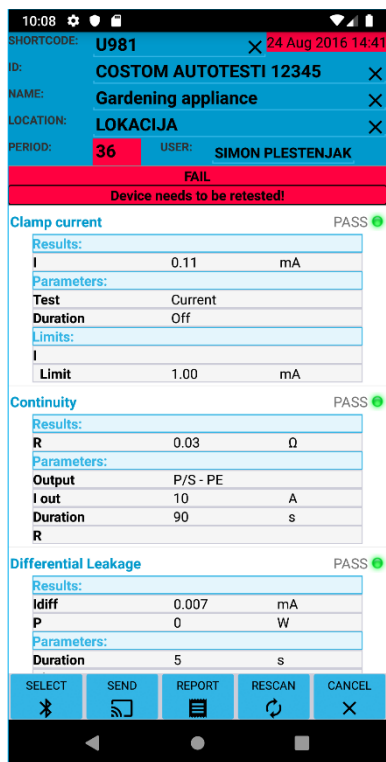


Figure 30: PAT test result

When QR/NFC/RFID is scanned it is possible to create a PDF report using the report button. It is similar to the projects PDF report. The report can be shared or saved.

Reports are saved under /aMESM/Reports/

14. Creating PDF reports

It is possible to create simple reports in PDF format from the currently opened project.

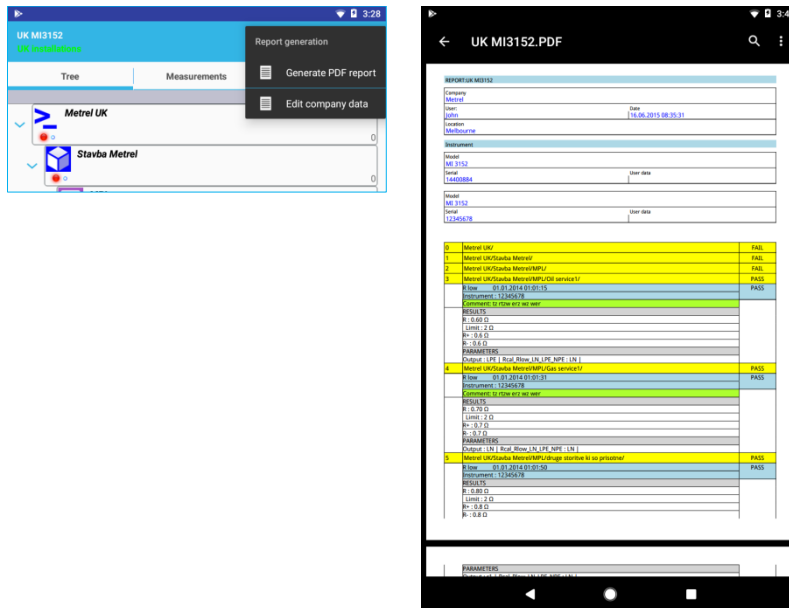


Figure 31: Test report

Before generation, the report header can be edited:

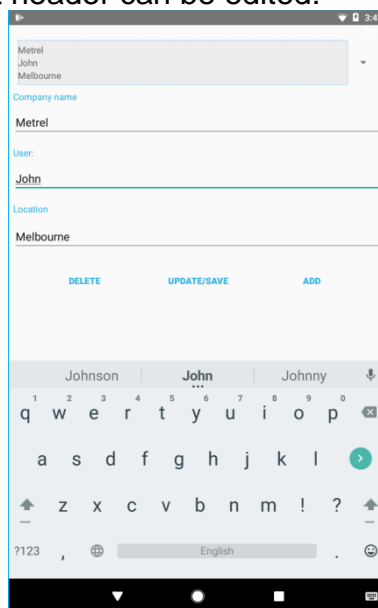


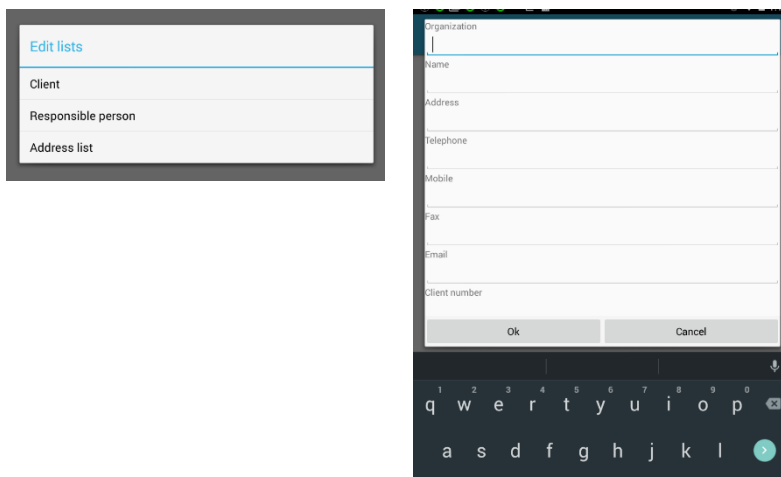
Figure 32: Report header editor

15. Edit lists

Pressing the “Edit lists” menu option opens an editor for adding:

- Client
- Responsible person
- Address list

These lists can be later selected as parameters on some of the structure elements, mainly when performing PAT testing.



The figure consists of two side-by-side screenshots of an Android application interface. The left screenshot shows a dialog box titled "Edit lists" with a blue header bar. Below the header, there are three list items: "Client", "Responsible person", and "Address list". The right screenshot shows a form titled "Organization" with a blue header bar. The form contains several input fields: "Name", "Address", "Telephone", "Mobile", "Fax", "Email", and "Client number". At the bottom of the form, there are two buttons: "Ok" and "Cancel". A keyboard is visible at the bottom of the right screenshot, indicating that the form is active and ready for input.

Figure 33: Client list editor

16. Activating devices

As long as you do not have any activated devices (which is the default configuration), the application will work in a limited “demonstration” operation mode, which disables up-/downloading to the instrument.

To be able to fully use the application, you need to activate at least one device. Each device you want to communicate with must be activated.

There are 2 types of license:

- BASIC license which allows downloading of workspaces from the instrument to aMESM.
- PRO license which allows up-/downloading of workspaces from the instrument to aMESM and vice versa.

16.1. Device activation procedure

First you need to press the action to add a new device at the bottom of the screen in the application settings:

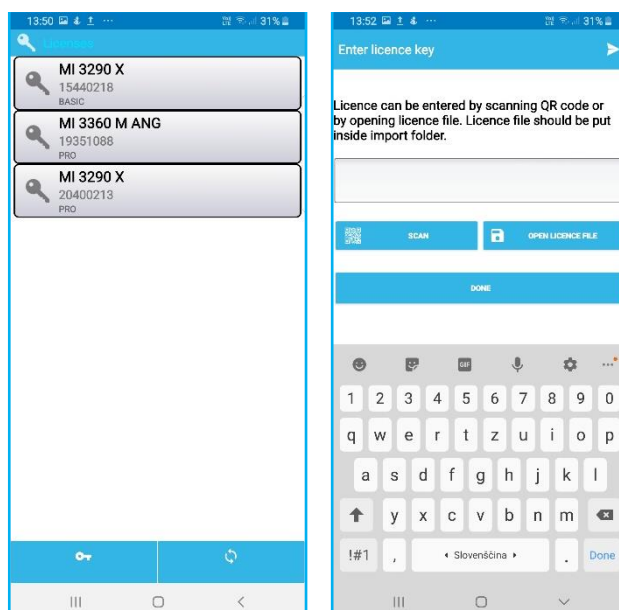


Figure 34: Device activation

Based on the serial number, type of instrument and license type, your dealer will give you a QR code or a license file to enter for that device. There are four possibilities of how to activate a device:

- scan a QR code
- import a license file
- enter the license manually into the given field
- Import license from instrument

After that, press either the Done button or the arrow in the top-right corner of the application to complete the activation.

Once it is done, the instrument is added to the list of activated devices and you can use the application to communicate with the instrument without any limitations.

To import license from instrument use sync icon to select and import license. This will work if instrument had license preloaded.

17. Settings

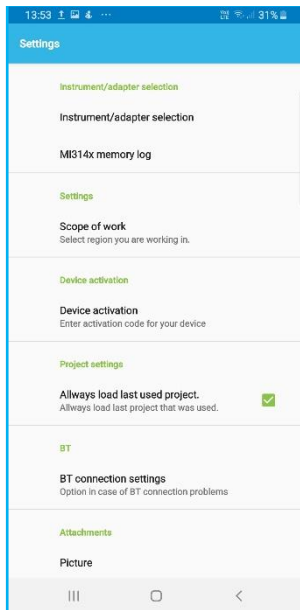


Figure 35: Settings menu

- **Scope of work:** Lets you choose a region you are working in.
- **Device activation:** Used to enter licenses for instruments.
- **Always load last used project:** Keeps the last used project loaded all the time. If the Application gets killed it will load the last used project next time it is started.
- **BT:** There are options in case of connection problems. Some devices have known bugs when connecting to BT. In case of trouble use this option.
- **Attachments:**
 - **Picture:** Picture quality can be selected here to keep attachments' size down.
- **Change log:** check changes in different versions of the aMESM application.

18. Troubleshooting

1. BT devices are not visible when scanning.
 - a. Go to Android device BT settings and check if devices are visible there. Pair them, then go back to the aMESM application and try to reselect them.
 - b. Turn BT OFF and back ON, then try to search for new devices again.
 - c. Try to reinitialize the BT module on the instrument.

19. Reporting errors, crashes, problems or suggestions

To report problems/suggestions use one of the emails listed:

- support@metrel.si
- android.apps@metrel.si

When reporting errors/crashes please include the following data:

- FW version of the instrument used in combination with aMESM.
- Serial number of the instrument used in combination with aMESM.
- The version of aMESM .
- Android version.
- Android device model.
- If possible, steps needed to reproduce error.

Providing us all this information will help shorten to process of gathering the needed data for finding the error and issuing a better version.