

April 2020

Emergency Lighting Testing

Application note

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SILVAIR Sp. z o.o.
ul. Jasnogórska 44
31-358 Kraków
Poland

Emergency Lighting Testing

Introduction

Emergency Lighting (EL) is a lighting device with battery back up designed to automatically provide a minimum level of lighting in the event that the main power supply fails as the result of a fire or a power cut, to enable all occupants to evacuate the building safely.

Regular testing of emergency lighting systems is mandatory in most jurisdictions and also a condition of insurance. In general, the building owner is required to run a monthly or weekly short functional test and a longer annual test. In addition, the building owner must store the testing reports for a specified period of time.

The two types of emergency lighting tests are:

1. **A functional test** (a short test, done monthly or weekly): it checks the integrity of the circuitry and the correct operation of a luminaire, switching device and the self-contained battery.
2. **A duration test** (a long test, done annually): checks if the self-contained battery supplies the system for the rated duration of the emergency operation.

Silvair Emergency Lighting Testing (ELT)

Silvair offers Emergency Lighting Testing (ELT) features. The driver will perform the functional and duration tests automatically and report them over the Bluetooth mesh network. The Silvair mobile app allows the test reports to be gathered from the self testing emergency lighting devices (e.g. drivers) in the network by reading the emergency lighting device state, the results of the last functional and duration tests, and generates an emergency lighting report. The user can then download the results as a CSV file and send the report by email. This can be done at any time by anyone with the appropriate authorization to access the network.

NOTE: The app does not configure test schedules; tests must be executed autonomously and automatically by each driver.

Required items

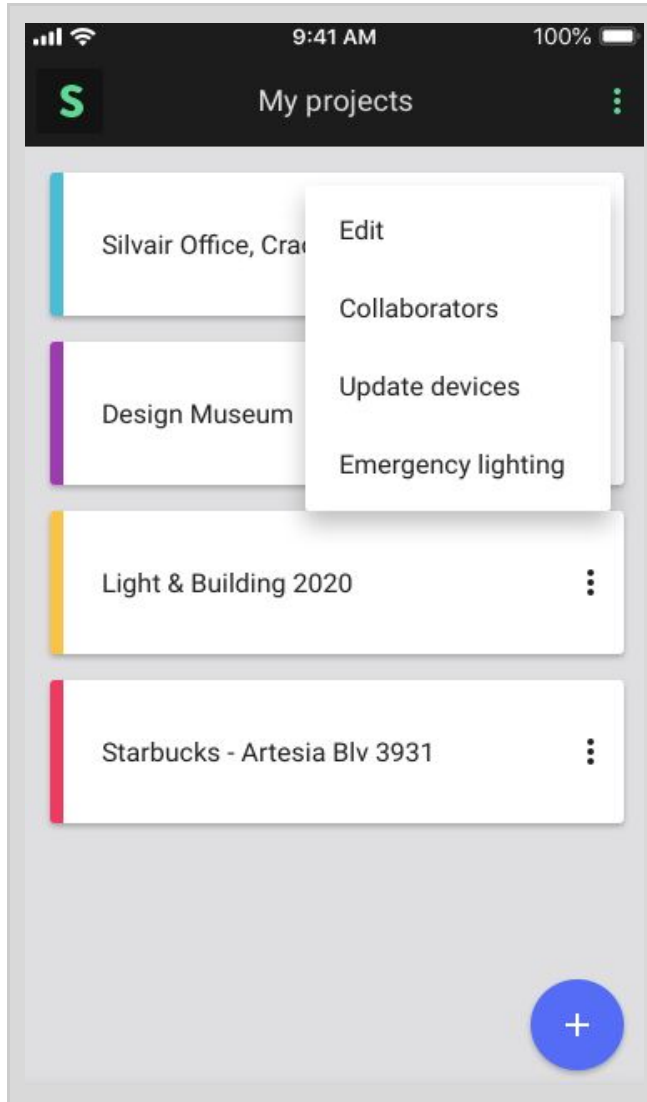
To use the Silvair Emergency Lighting Testing features you must:

- Have a lighting project commissioned with the Silvair Commissioning system
- Have an emergency lighting devices / luminaires with Silvair firmware that support ELT¹

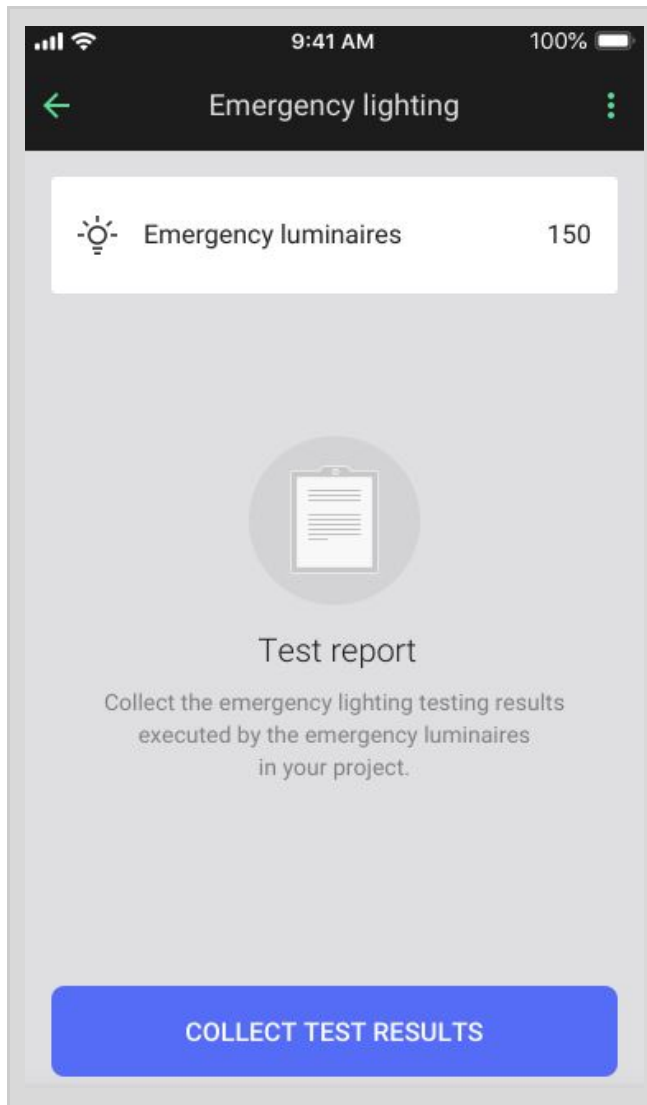
¹ Emergency Lighting Testing is supported only for devices with dual-chip (UART) firmware. The firmware version must be 2.15.2 or higher.

- Devices must have the ability to self-test autonomously, at least every 30 days
- Be on-site on the lighting installation to be able to collect the test results.

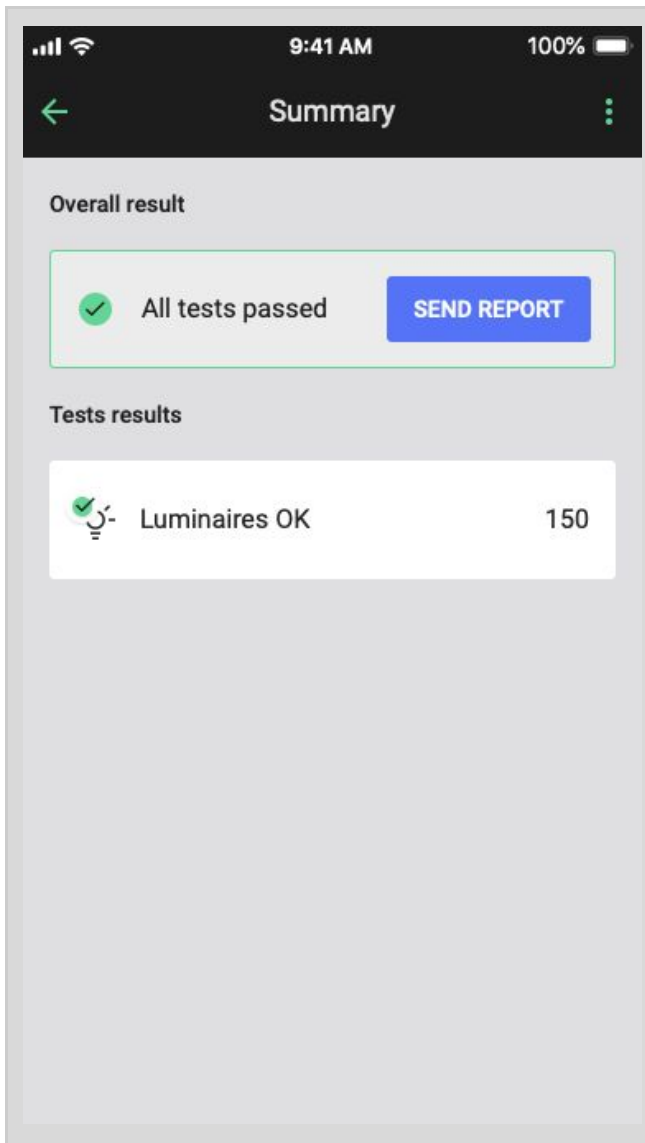
Generate Emergency Lighting Report



- To generate the Emergency lighting testing report open the Silvair mobile app and navigate to the **Projects** menu.
- Select the project and open the project context menu
- Tap **Emergency lighting**

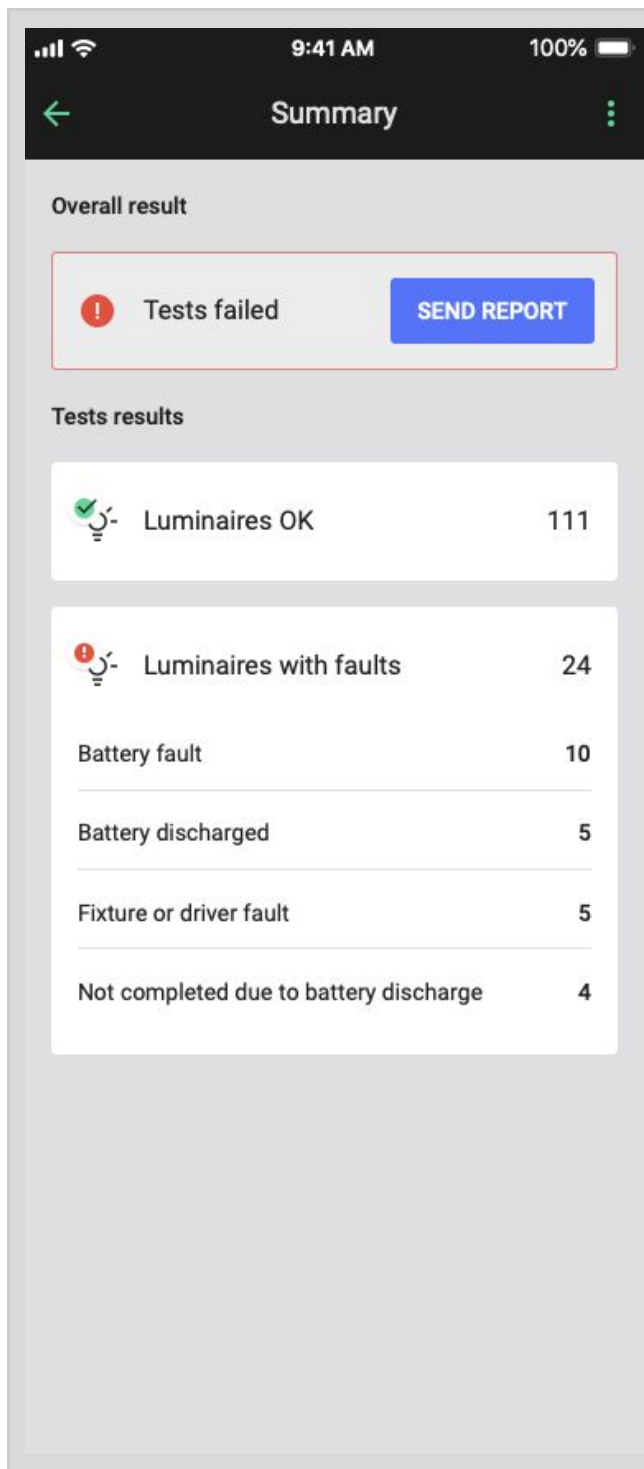


- After pressing the Emergency lighting button, the user can see number of the emergency devices in the project
- Tap **Collect Test Results**
- The app will start gathering test results from all emergency lighting devices in the project



Case 1: Test Passed

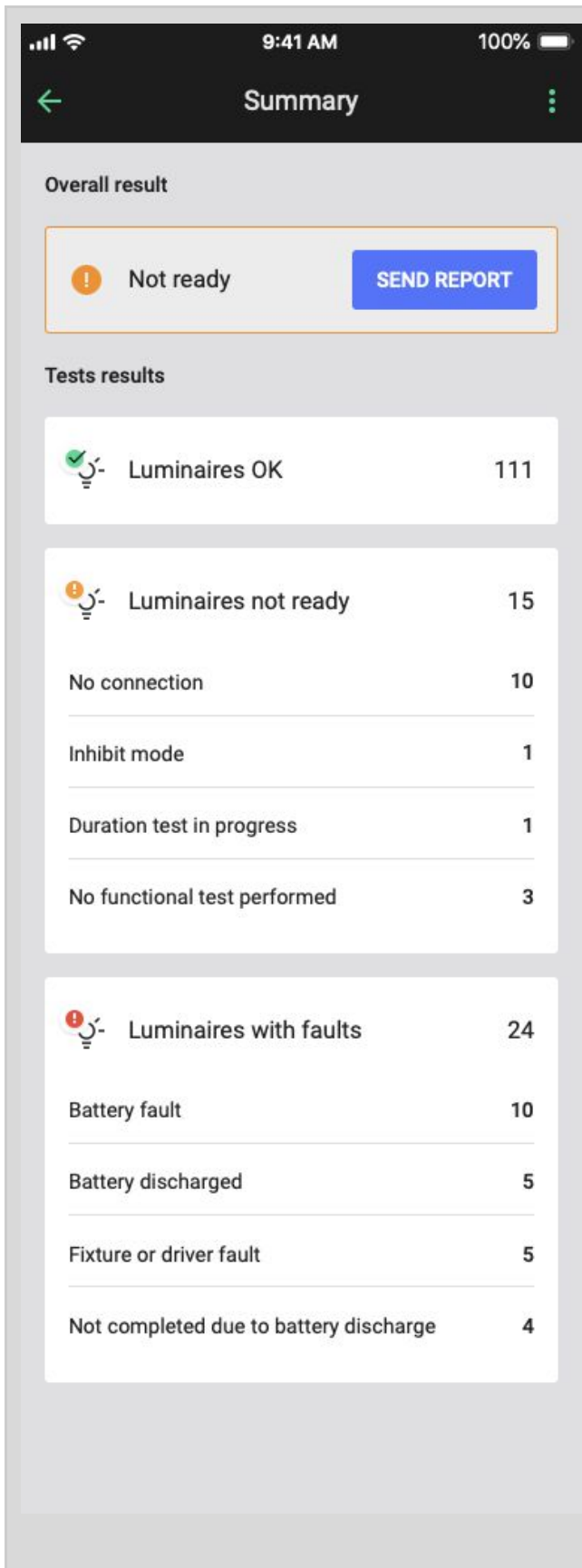
- Emergency lighting test results have been gathered from all devices successfully
- **All tests passed** indicates that:
 - All devices are in the normal state
 - All devices passed the functional or duration test within the last 30 days
 - No devices reported faults in any of the tests
- Press **Send Report** to download the report in a CSV format. It can then be sent on e.g. over email, AirDrop, or other channel



Case 2: Tests Failed

- **Tests failed** show when all devices are operating normally but at least 1 device reported a fault in any test.
- See **Tests results** for details of device statuses and faults.
- Press **Send Report** to download the report in CSV file format. It can then be sent e.g. over email, AirDrop, or other communicator.

NOTE: A single device may report more than one fault, so the total sum of faults may be different from the number of luminaires in a network.



Case 3: Not Ready

- The result **Not ready** shows when
 - There were issues collecting tests results from at least one device
 - Test results for at least one device are not ready, e.g. the test is in progress, or no test has been performed
 - At least one device is not in normal operation, e.g. it is in Emergency mode or Inhibit mode.
- In this case, please check the device statuses and troubleshooting for details. When the issues are fixed, collect the test results again.
- Press **Send Report** to download the detailed report in CSV file format. It can then be sent over email, AirDrop, or another channel.

Emergency Lighting Testing Report

Report file name: Report_Generation_Date_Project_Name_ELТ_REPORT.csv

Report file content

DEVICE UUID	DEVICE NAME	AREA NAME	ZONE NAME	CURRENT ELТ STATE	FUNCTION TEST RESULT	FUNCTI ON TEST FAULTS	FUNCTI ON TEST DATE	DURATI ON TEST RESULT	DURATI ON TEST FAULTS	DURATI ON TEST DATE	DURATI ON TEST LENGTH
3EF5DCA3233558F7C0093FFD90E21DA8	Light fixture 3ef5	Floor 1	Conferenc e room	normal	completed		3000-01-01 00:55:45 +0100	complet ed		3000-01-01 00:55:45 +0100	249600.0s
5C25A990D66430DB789A3C00FFA6E4A0	Light fixture 5c25	Floor 1	Conferenc e room	normal	completed	batteryF ault	3000-01-01 00:55:45 +0100	complet ed	batteryF ault	3000-01-01 00:55:45 +0100	249600.0s
D8EAA2D5115E784647E418061BCC827E	Light fixture 5c25	Floor 1	Conferenc e room	connection error							
3EF5DCA3233558F7C0093FFD90E21DA8	Light fixture 3ef5	Floor 2	Corridor	connection error							
5C25A990D66430DB789A3C00FFA6E4A0	Light fixture 5c25	Floor 2	Corridor	normal	completed	batteryF ault	3000-01-01 00:55:45 +0100	complet ed	batteryF ault	3000-01-01 00:55:45 +0100	249600.0s

Field	Description
Device UUID	The unique device identifier (128-bit, 32 characters)
Device name	The current name of the device in the project. The name is provided by the manufacturer and can be changed by the user during the commissioning process.
Area name	Name of the area where the device is operating.

Zone name Name of the zone where the device is operating.

Current ELT State Current state of the emergency lighting device.

- normal
- prolongedEmergency
- Emergency
- Rest
- Inhibit
- durationTestInProgress
- functionTestInProgress
- batteryDischarged
- connectionError

Function test result The result of the function test:

- completed
- incompletd

Function test faults The faults reported by the device during the function test result. The value is empty if the device has not reported any faults.

Faults reported when the test was completed.

- batteryFault
- batteryDischarged
- chargingFault
- lampDriverFault
- overTemperatureEvent
- overVoltageEvent

Faults reported when the test was not completed.

- cancelled
- cancelledEmergency
- notRunBatteryNotCharged
- notCompletedBatteryDischarged

Function test date The date of the last function test. The value is empty if the function test has not been performed.

Duration test result The result of the function test:

- completed
- incompleted

Duration test faults The faults reported by the device during the duration test result. The value is empty if the device has not reported any faults.

Faults reported when the test was completed:

- batteryFault
- batteryDischarged
- chargingFault
- lampDriverFault
- overTemperatureEvent
- overVoltageEvent

Faults reported when the test was not completed:

- cancelled
- cancelledEmergency
- notRunBatteryNotCharged
- notCompletedBatteryDischarged

Duration test date The date of the last duration test. The value is empty if the duration test has not been performed.

Duration test length The test duration measured in seconds.

Troubleshooting

When the emergency lighting test has not ready status or there are faults in any test, please follow the steps below:

1. Generate the report from the devices.
2. Analyze the report results.
3. If the test failed or a device has not ready status then download the report in CSV file format.
4. Check the problem and solution for each of the devices that reported faults.
5. With the help of the information contained in the report locate the faulty device and take the necessary action. The table below lists the possible statuses and their solutions.

Not Ready status

Status	Description / Possible causes	Solution
Connection error	<p>The mobile app couldn't collect the status and test result from the device.</p> <p>The device may be unavailable in the mesh network, broken or powered off.</p>	<p>Make sure that the device is available in the mesh network and operating normally.</p> <p>Make sure that the mesh network quality is good and it's configured properly. More information can be found in app note: <i>SN-202: Optimizing mesh network performance</i> available in Knowledge Base</p>
No test performed	No test has been performed in the last 30 days.	<p>Make sure that the emergency device is capable of executing tests autonomously and automatically, and at least a functional test is performed approximately every 30 days.</p> <p>Try to collect the test results from the devices again at least 30 days after installation.</p>
Emergency	The mains power supply for the device failed and it is in emergency mode and cannot self-test.	Check if the device is supplied with mains voltage.
Prolonged	The device continues to operate the	The device should interrupt its emergency

Emergency	luminaire as in emergency mode for the programmed prolong time after the restoration of the mains power supply.	mode operation after a preset time or after reaching the low voltage battery cut-off level (discharge protection), i.e. after exceeding the total operating time.
Rest mode	Rest mode prevents full discharge of a device after experiencing a power outage.	Make sure the mains power supply is reconnected and the Rest mode is disabled.
Inhibit mode	The device is powered from the mains but prevented from going into emergency mode in the event of mains failure.	Make sure that the power supply does not have faults and is connected properly and the Inhibit mode is disabled.
Duration test in progress	A device is in the process of running a duration test.	Try to collect the test results from the devices again later, after the duration test is completed.
Function test in progress	A device is in the process of running a function test.	Try to collect the test results from the devices again later, after the function test is completed.
Battery discharged	The device battery is discharged and cannot provide emergency lighting function.	The device battery needs recharging. Try to collect the test results from the devices again later, after the function test is completed.

Faults

When the tests failed and at least one device reported a fault in any test

Error	Description
Battery fault	A device has a battery fault.
Battery discharged	A device has a discharged battery.

Charging fault	A device has a battery charging fault.
Luminaire or driver fault	There was a luminaire or a driver fault.
Over Temperature	There was an over temperature event.
Over voltage	There was an overvoltage event.
Test cancelled	The test was cancelled.
Test cancelled due to emergency	The test was cancelled due to an emergency condition.
Test not performed due to battery not charged	The test was not run due to the battery not being sufficiently charged.
Test not completed due to battery discharge	The test was not completed due to battery discharge.

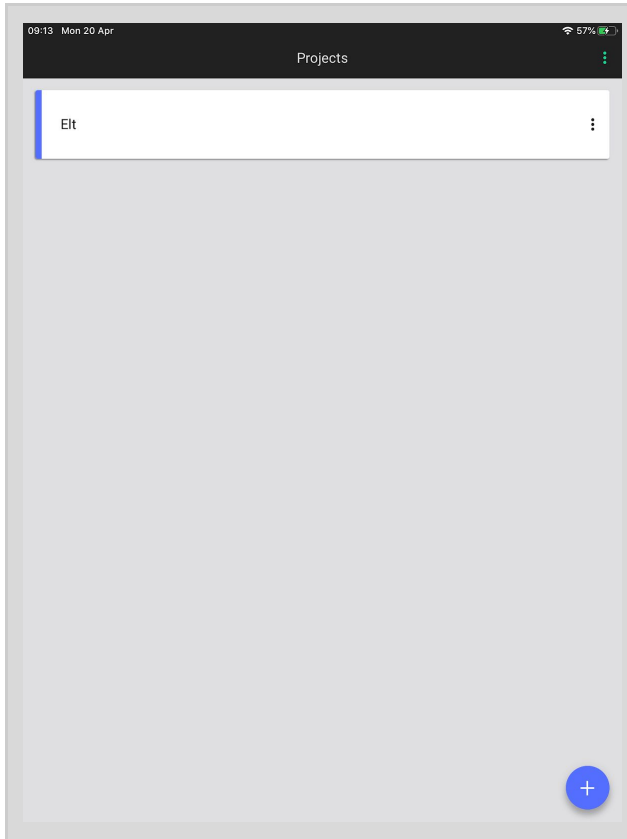
Replacing an emergency lighting device in a project

To replace emergency lighting device please follow the steps:

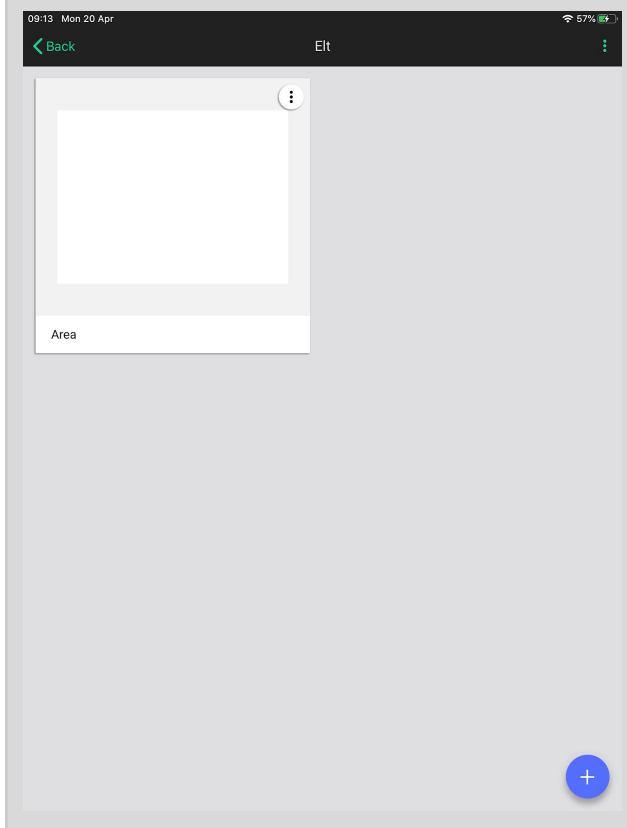
1. Make sure that the device you want to replace is removed from the project. Please follow the **Remove device** section in the User Manual to see step by step instructions.
2. Commission a new emergency lighting device and add it to the project with the mobile app. Please follow the **Adding devices** section in the User Manual to see step by step instructions.
3. The app should configure the device automatically. If not, it needs to be done manually using the mobile app. Please follow the **Configure all devices in a zone** section in the User Manual to see the step by step instructions.

Triggering the tests manually

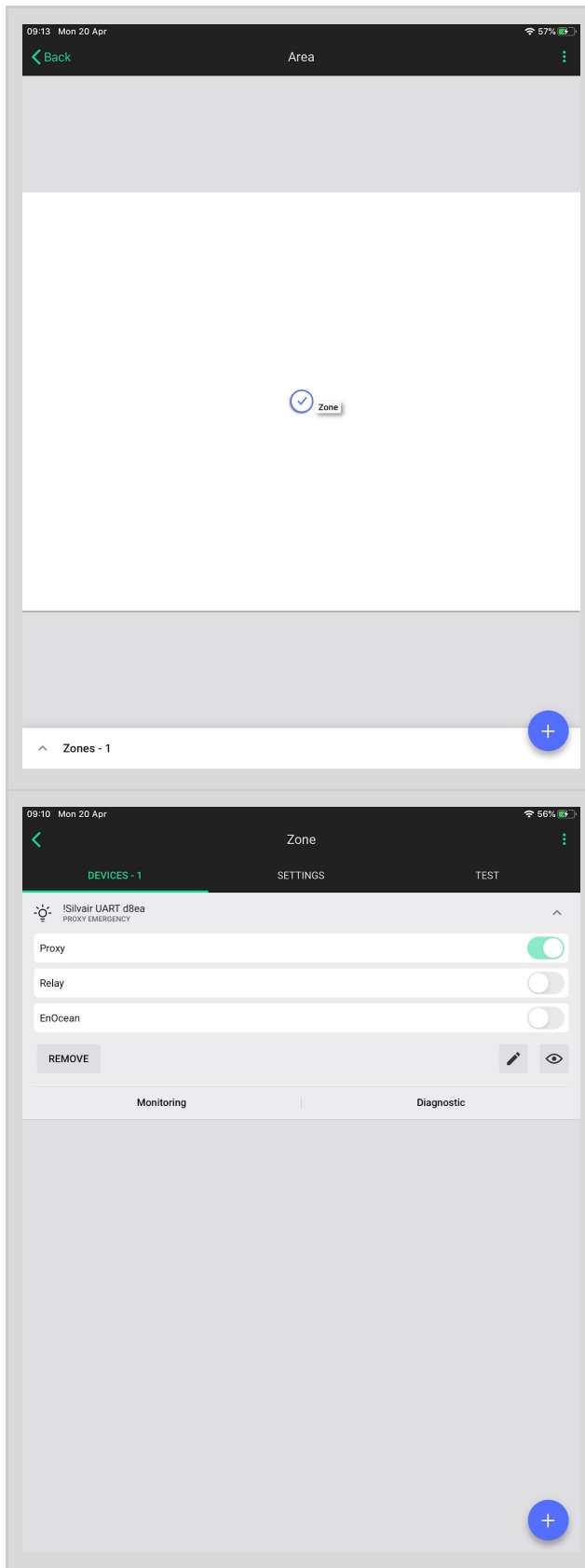
If you need to trigger the particular test manually for a selected device, e.g. after replacing the battery of the luminaire, you can do it using the Device diagnostic panel in the mobile app. Please follow the information listed in the table below to find step by step instructions.



STEP 1.
Select the project.

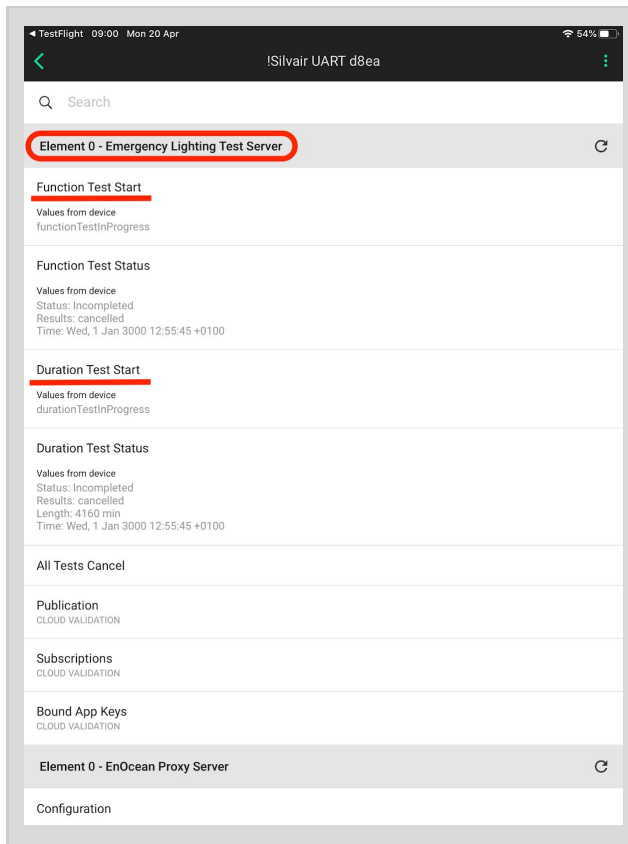


STEP 2.
Select the area.



STEP 3.
Select the zone.

STEP 4.
Select the device, expand the list with device details and tap the Diagnostic button.



Step 5.

Find the **Emergency Lighting Test Server** section:

- To trigger the functional test tap: **Function Test Start**
- To trigger the duration test tap: **Duration Test Start**

FAQ

Q: Where can I find reports generated over the last 1, 2, 5 years? Where does the application store reports? What if I didn't send my report or I lost it?

A: Reports generated by the app are not stored anywhere by the application. You must send and store the report yourself. The report generated in the past cannot be restored.

Q: How often can the reports be generated?

A: The reports can be generated as many times as you wish.

Q: Can I trigger the tests manually?

A: Yes, you can trigger a test for a single device using the **Diagnostics** panel in the mobile app. See [Triggering the tests manually](#) section.

Q: How can I see where the faulty devices or devices with issues are in the building?

A: You may download the detailed Emergency lighting testing report (send over the email, AirDrop, or another channel). The CSV contains information about the location of the device in the project (Device name, Area, Zone), as well as detailed information about the status and error of the device. The zone location can be checked on the floorplan available in the web and mobile app.

Q: Can I configure the schedule for emergency device testing?

A: You cannot yet configure the testing schedule; tests must be executed autonomously and automatically by each driver.

Q: Who can use the emergency lighting testing feature in the app?

A: Everyone who has the [required items](#).

Contact Information

Support:

support@silvair.com

Business development:

business@silvair.com

For more information
please visit:

www.silvair.com

Our offices:

Europe

ul. Jasnogórska 44
31-358, Kraków
POLAND

North America

717 Market Street, Suite
100
San Francisco, CA 94103
USA