

Silvair Emergency Lighting Testing

Application note

| | |
|--------------|-----------------|
| 1 March 2023 | SN-214 rev. 3.1 |
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SILVAIR Sp. z o.o.
ul. Jasnogórska 44
31-358 Kraków
Poland

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1. Introduction

Emergency lighting devices automatically provide enough light if the power is cut, allowing all occupants of a building to evacuate safely in the event of a fire or other emergency. The Silvair Emergency Lighting Testing feature is designed for self-testing emergency lighting devices with a backup battery.

 The Silvair Emergency Lighting Testing is not designed for use for emergency lighting solutions with a central battery system.

Regular testing of emergency lighting is often mandatory by law and a condition of building insurance. The building owner may be required to carry out testing and keep the test results for a specified period of time.

1.1 Operation

The Silvair solution is based on emergency lighting testing (ELT) that is carried out automatically by each device according to a schedule defined by the user in the Silvair web app. Tests can also be started manually for a specific device using the Silvair mobile app.

The mobile app is used to collect the test results from all emergency devices in the project. The results are then sent to the cloud, can be viewed in the Silvair web app, and can be printed to a PDF file.

Two types of tests can be scheduled: functional and duration.

1.2 Type of tests

| Type | Interval | Description |
|------------|------------------|--|
| Functional | Every 1–52 weeks | Short test. It checks the integrity of the circuit and the correct operation of the luminaire, switching device, and backup battery. Carried out at the same time for all zones. |
| Duration | Every 4–52 weeks | Long test. It checks if the backup battery provides power for the required period of emergency operation which cannot be less than 60 minutes. A duration test should be carried out separately for at least two groups of zones so that luminaires in adjacent zones are not tested at the same time. You can create up to four groups of zones and configure the test to start in each group separately at intervals of one week. |

1.3 Requirements

For the Silvair Emergency Lighting Testing to work correctly, the following are necessary:

- The lighting project has been commissioned with the Silvair Commissioning tools.
- The project contains luminaires that support ELT¹.
- The project version is 202201 or later.
- All areas are within radio range and can communicate with each other.
- You or a collaborator with access to the project are on-site to collect the test results.

¹ Dual chip (UART) device with Silvair firmware version 2.21 or later, connected to a DT1 DALI driver.

2. Defining zones

Silvair web app

1. Define the zones so that there is only one emergency luminaire per zone.



If you add two or more emergency luminaires to a zone, they will be tested at the same time. If an emergency occurs during or shortly after the duration test, these luminaires will not be able to provide the emergency lighting function.



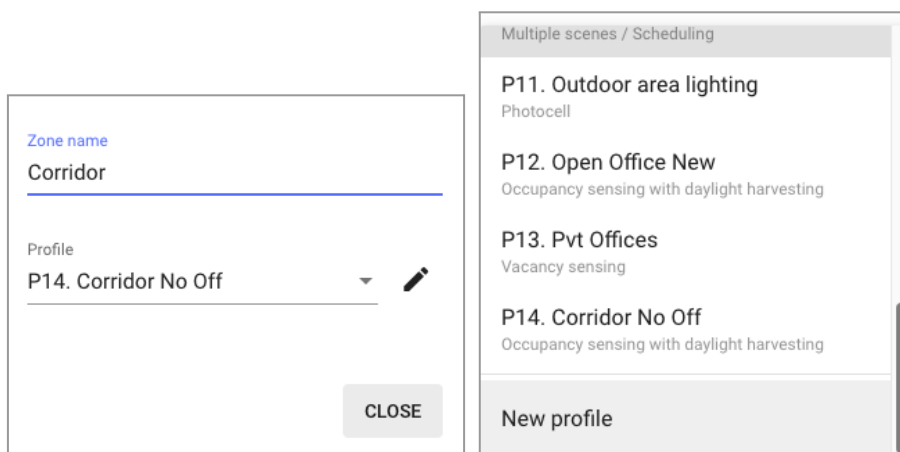
We recommend that you have at least one device with a fully charged battery and a real-time clock (RTC) in the network. The battery will act as the source of time in the network during a power outage. The RTC will keep the time drift to a minimum to make sure that the scheduling is accurate.





Time drift is the difference between the real time and the time in the mesh network.

In networks without an RTC, the time drift can be up to approximately 2 minutes per month. In networks with an RTC, the time drift can be up to approximately 30 seconds per month.

2. In the [Silvair web app](#), open the project and area.
3. Create the defined zones. To create a zone, go to the **Commissioning** tab and click on the floor or site plan. To edit an existing zone, click the zone icon.
4. Expand the **Profile** list and select a profile.



5. Click  and edit the parameters².
6. Click **Save** to save the profile.
7. Repeat steps 2–6 for all areas and zones.

 When a project is created or updated to version 202201, the functional and duration tests will be assigned a default ELT schedule. See [Scheduling the tests](#) for how to adjust the schedules.


² For more information about parameters, see [SN-200 Silvair Commissioning user manual](#).


3. Scheduling tests

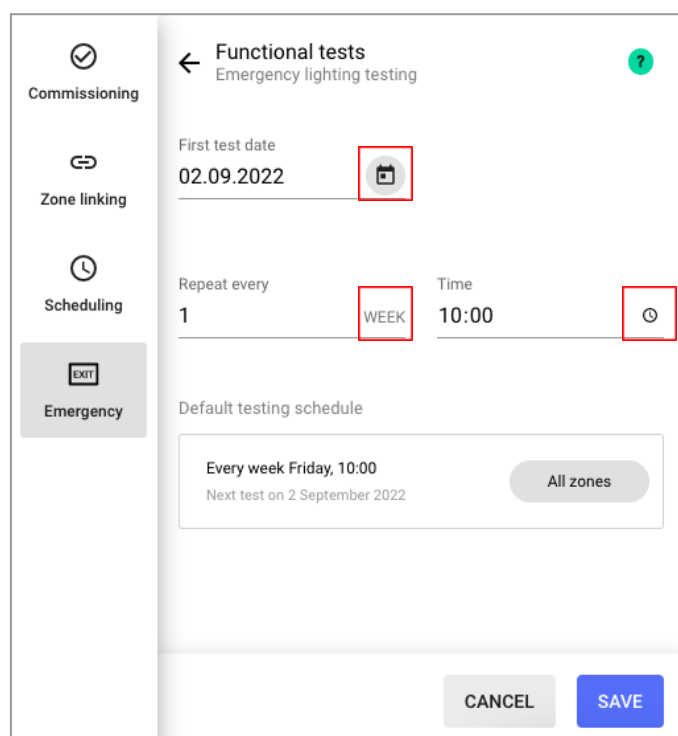
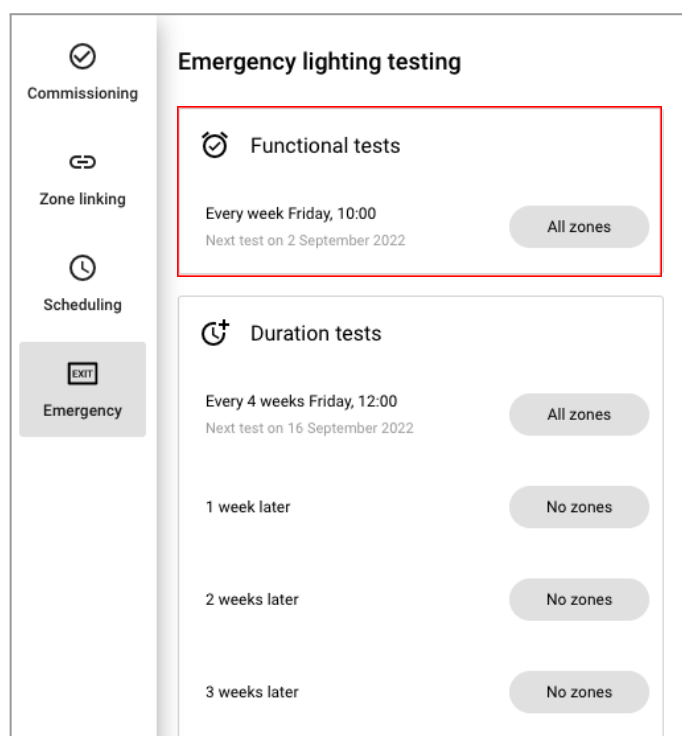
3.1 Adjusting the functional test schedule

Silvair web app

1. In the [Silvair web app](#), open the project and area.
2. On the left, click **Emergency**.
3. Click **Functional tests**.
4. Set the date, time, and interval of the test.

 The test schedule will be adjusted.

 The functional test schedule applies to all zones.



5. Click **Save**.

Silvair mobile app


6. In the **Silvair mobile app**, add devices to the zones.

 All emergency devices will receive the updated test schedule.


3.2 Adjusting the duration test schedule

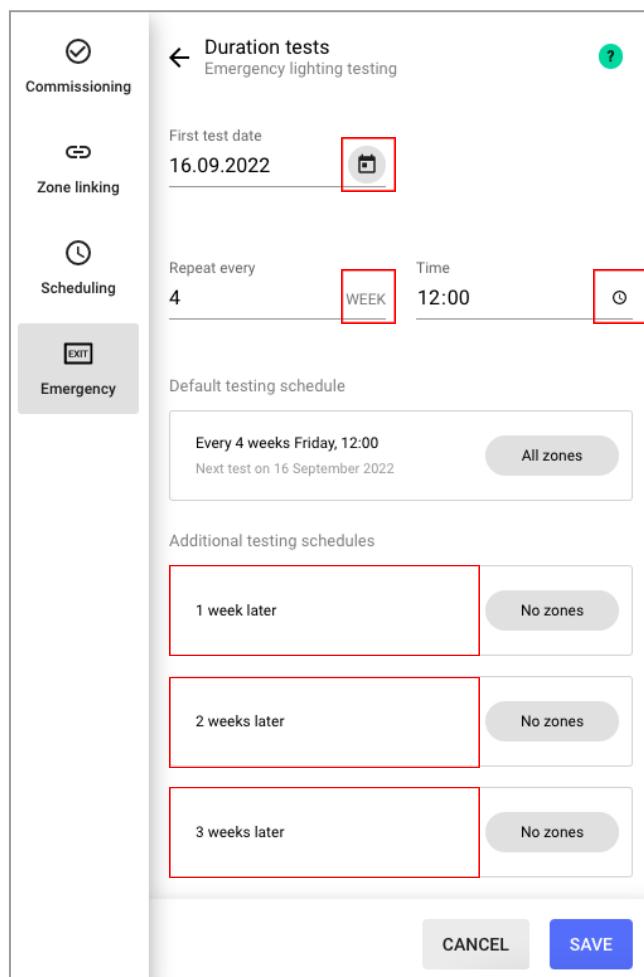
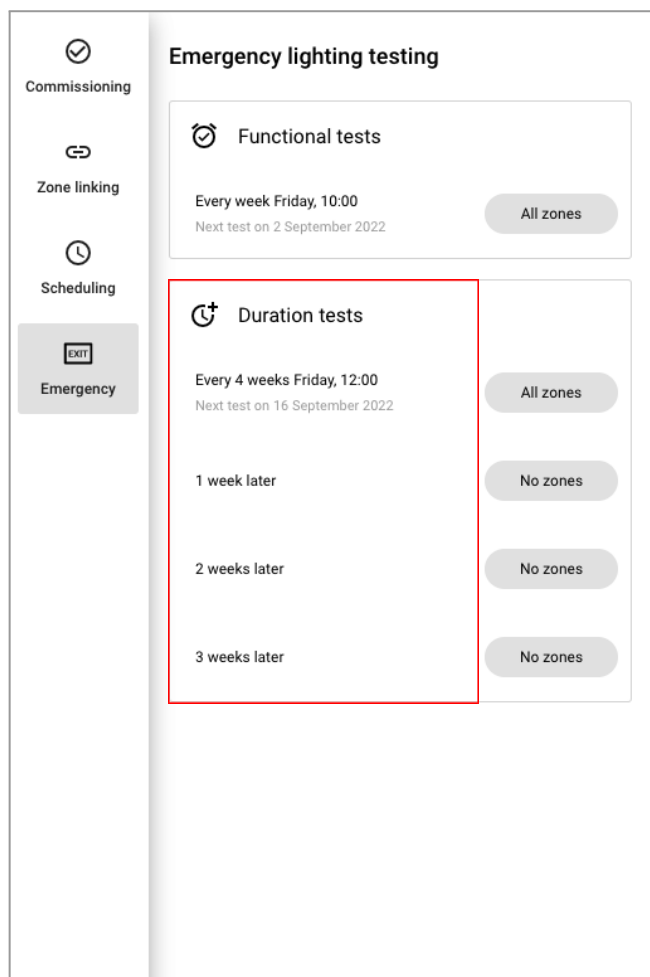
Silvair web app

1. In the [Silvair web app](#), open the project and area.
2. On the left, click **Emergency**.
3. Click **Duration tests**.
4. Set the date, time, and interval of the test.

 The test schedule will be adjusted.

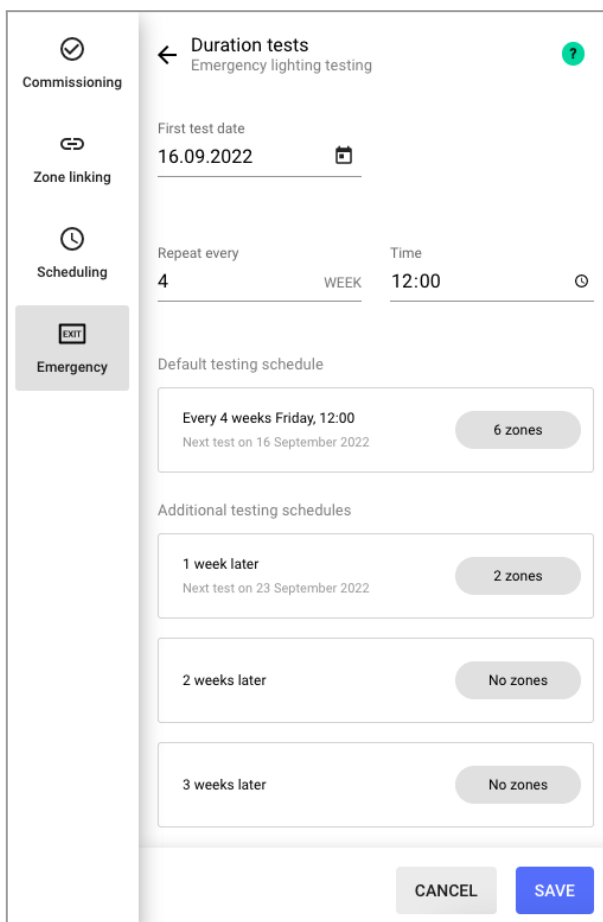
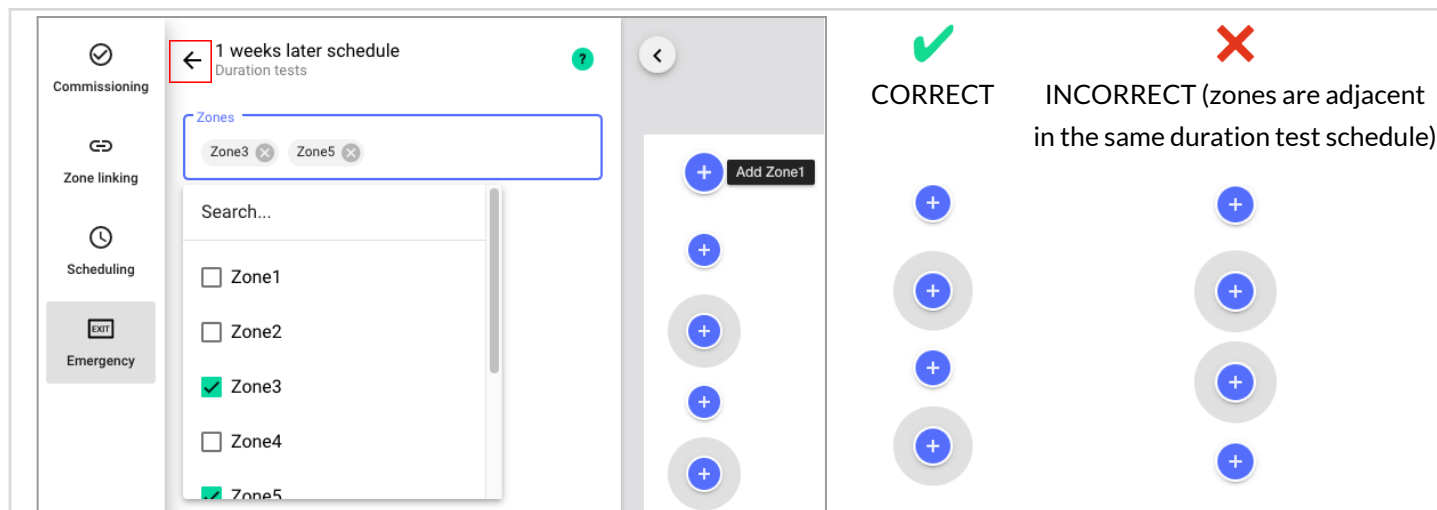
5. If you want the test for some zones to be scheduled 1, 2, or 3 weeks later, click one of the **Additional testing schedules**.

 We recommend that you create additional schedules so that luminaires in adjacent zones are tested at different times. If they are tested at the same time and an emergency occurs during or shortly after the duration test, they will not be able to provide the emergency lighting function.



6. To select zones, select them on the floor or site plan, or click the **Zones** field and select the zones from the list.

 When you add a zone to one schedule it is removed from any other schedules.



7. Click ← to go back to the duration test settings.
8. To add more additional schedules, repeat steps 5–7.
9. Click **Save**.


Silvair mobile app

10. In the **Silvair mobile app**, add devices to the zones.

 All emergency devices will receive the updated test schedule.

4. Collecting the test results

Silvair mobile app

1. Open the **Silvair mobile app**.
2. Tap  next to the project name and select **Emergency lighting**.



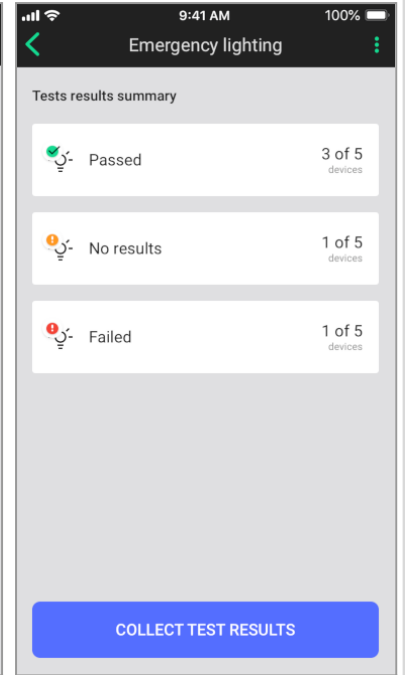
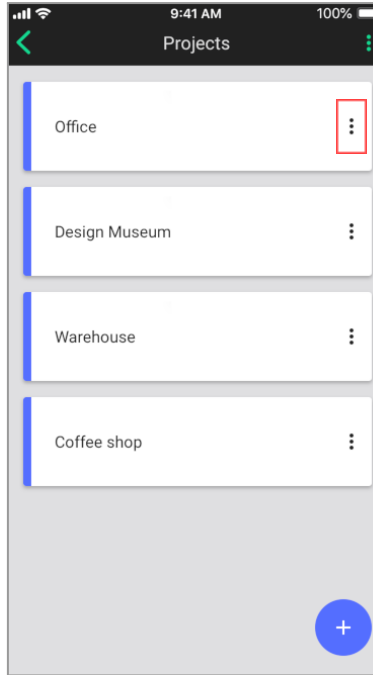
A summary with the test results will appear.

“Passed” means that the luminaire has passed the functional and duration test and the duration test lasted at least 60 minutes.



For details, view the [ELT report](#) in the web app.

3. Tap **Collect test results**.



4. Tap the area you want to collect test results from.
5. Move to the area to collect the test results.



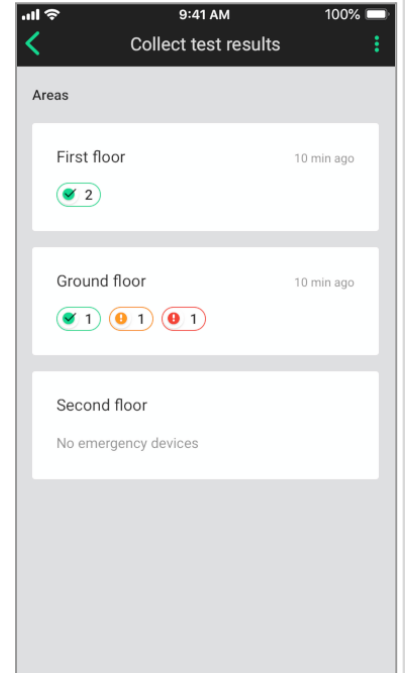
When you get in range of the area, the Silvair mobile app will start collecting the test results from the emergency devices in this area.



You cannot collect test results from an area if the app is not connected to it.



After the results have been collected, an updated summary with the test results will appear.



5. Viewing and printing the ELT report

In the **Silvair web app**, open the project and click **Emergency**.


Emergency lighting report

Areas Collaborators Gateways Energy use **Emergency** Report Edit project

Passed 3 No results 1 Failed 1

| Emergency devices | | | | | | |
|------------------------------|--------------|-----------------|-----------------------|-------------------------|-------------------------------|--------------------------------------|
| Name | Area | Zone | Last update | State | Functional test | Duration test |
| ISilvairOffice UART 840 839e | First floor | Firmware QA | Jan 27, 2023 12:39 | Normal Battery: 100% | Passed Jan 27, 2023, 10:00 | Passed 60 min Jan 6, 2023, 13:00 |
| ISilvairOffice UART 840 d083 | First floor | Platform Mobile | Jan 27, 2023 12:39 | Normal Battery: 100% | Passed Jan 27, 2023, 10:00 | Passed 180 min Jan 6, 2023, 15:00 |
| Mobile UART 06cd | Ground floor | Emergency | Jan 27, 2023 15:22 | No response | No response | No response |
| ISilvairOffice UART 840 ef60 | Ground floor | Hardware | Jan 27, 2023 15:22 | Normal Battery: 100% | Passed Jan 27, 2023, 10:00 | Failed 58 min Jan 6, 2023, 13:00 |
| ISilvairOffice UART 840 b199 | Ground floor | Kitchen | Jan 27, 2023 15:22 | Normal Battery: 100% | Passed Jan 27, 2023, 12:54 | Passed 178 min Jan 6, 2023, 15:00 |

Lamp fault Circuit fault Battery fault Battery duration fault

To print the report to a PDF file, click .

5.1 Device state

| State (at the time of collecting the test results) | Description |
|---|---|
| Normal | Luminaire is ready to provide the emergency lighting function. |
| Emergency | Luminaire is in an emergency state. Power is disconnected or cut off. |
| Extended emergency | Luminaire is in an extended emergency state. Power was restored recently. |
| Inhibit | Luminaire is in an inhibit state that saves battery life by preventing emergency operation. Power is on. |
| Rest | Luminaire is in a rest state that saves battery life by preventing emergency operation. Power is off. The luminaire goes back to normal state when power is restored. |
| Functional test | Functional test is in progress. |
| Duration test | Duration test is in progress. |
| Battery discharged | Luminaire cannot provide the emergency lighting function. |
| To be collected | Luminaire state has not yet been read. |
| No response | Luminaire is unavailable in the mesh network, damaged, or powered off. |


5.2 Test state

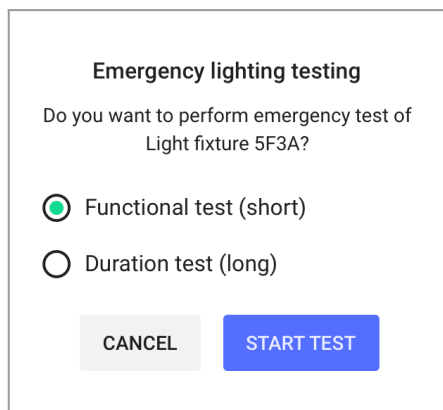
| State (at the time of collecting the test results) | Description |
|--|---|
| Passed (functional test) | Luminaire has passed the functional test in the last 31 days. |
| Passed (duration test) | Luminaire has passed the duration test in the last 365 days. The test lasted for the required time of emergency operation and not less than 60 minutes. |
| Failed (functional test) | Luminaire/driver fault or battery fault/discharge. |
| Failed (duration test) | Luminaire/driver fault, battery fault/discharge, or the duration test lasted for less than 60 minutes. |
| Out of date (functional test) | Functional test was carried out more than 31 days ago. |
| Out of date (duration test) | Duration test was carried out more than 365 days ago. |
| Triggered | Test was triggered, but no information was received if it was started or postponed. |
| In progress | Test started and is in progress. |
| Postponed | Test postponed. The battery is low or the luminaire is in a different state than normal. |
| Stopped | Test was stopped by the user. |
| Dropped | Timeout expired before the test started. |
| Timeout | Timeout expired during the test. |
| Not yet tested | Luminaire has not yet been tested. |
| To be collected | Test result has not yet been collected. |
| Unknown | No communication with the driver. |
| No response | Luminaire is unavailable in the mesh network, damaged, or powered off. |

To resolve issues, see [Troubleshooting](#).

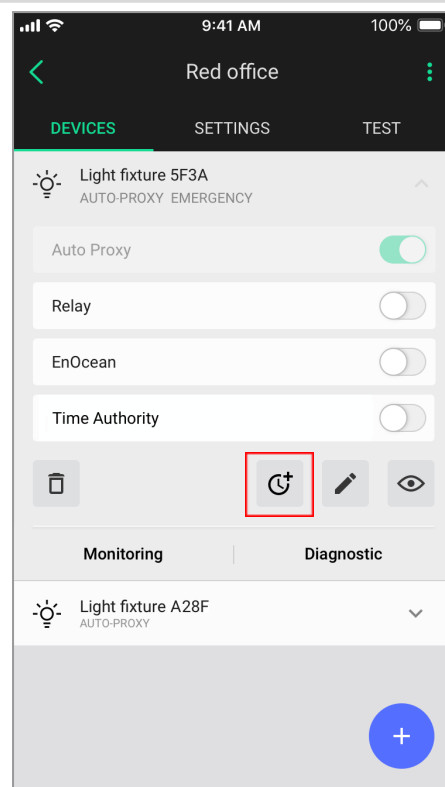
6. Starting the test manually

Silvair mobile app


1. In the **Silvair mobile app**, open the project, area, and zone.
2. On the **Devices** tab, tap the emergency device.
3. Tap .
4. Select the type of test you want to carry out and tap **Start test**.




If the test cannot be started or is in progress, a message will appear.




7. Syncing the time in the mesh network


 If the power is restored after a power outage and there is no source of time in the network, the tests will be carried out according to the user-defined intervals but not at the correct time. To make sure that the tests are carried out at the correct time, sync the time using the following method.

Silvair mobile app

1. Open the **Silvair mobile app**.
2. In the project field, tap  and select **Time sync**.
3. Tap **Sync time** to sync the time between the mobile device and the mesh network.

 Tests will then be carried out at the correct time.

 We recommend that you have at least one timekeeping device with a fully charged battery and an RTC in the mesh network. The battery will act as the source of time in the network during a power outage. The RTC will keep the time drift to a minimum to make sure that the scheduling is accurate.

 You can also use the mobile app periodically to sync the time between the mobile device and the mesh network to keep the time drift to a minimum.

8. Troubleshooting

| Problem | Cause | Solution |
|--------------------|--|--|
| Test failed | Fixture fault | Contact the manufacturer of the luminaire. |
| | Circuit fault | Contact the manufacturer of the luminaire. |
| | Battery fault | Check the battery connection. If the battery is damaged, replace it. For more details, refer to the luminaire documentation. |
| | Battery duration fault | Check the battery connection. If the battery is damaged, replace it. For more details, refer to the luminaire documentation. |
| Test out of date | Functional test carried out more than 31 days ago. | Make sure that the tests are scheduled correctly . Then start the test manually or wait until the next scheduled start of the test. |
| | Duration test carried out more than 365 days ago. | |
| Test triggered | Test was triggered but no information was received if it was started or postponed. | Collect the test results again. |
| Test in progress | Test started and is in progress. | Wait until the test is completed and collect the test results again. |
| Test postponed | The battery is low or the luminaire is in a different state than normal. | Make sure that the luminaire is connected to power and is in the normal state. Wait until the current test is completed, or cancel the test and start a new test manually . Then collect the test results again. |
| Test stopped | Test stopped by the user. | Start the test manually or wait until the next scheduled start of the test. Then collect the test results again. |
| Test dropped | Timeout expired before the test started. | Start the test manually or wait until the next scheduled start of the test. Then collect the test results again. |
| Test timeout | Timeout expired during the test. | Start the test manually or wait until the next scheduled start of the test. Then collect the test results again. |
| Not yet tested | Luminaire has not yet been tested. | Start the test manually or wait until the next scheduled start of the test. Then collect the test results again. |
| To be collected | Test result has not yet been collected. | Collect the test results . |
| Test state unknown | Problem with the luminaire or the luminaire has not yet been tested. | Start the test manually . If the problem persists, contact the manufacturer of the luminaire. |
| No response | Luminaire is unavailable in the mesh network, damaged, or powered off. | Make sure that the luminaire is connected to power. In the Silvair mobile app, go to the zone where the luminaire has been added. Then tap  next to the luminaire name to identify the luminaire – it should flash. |
| | | Make sure that the quality of the mesh network is good and that it is configured correctly. For more information, see SN-202: Optimizing mesh network performance . |

| Problem | Cause | Solution |
|--|--|---|
| Luminaire is in the inhibit state but should be in the normal state | The inhibit state was enabled manually and was not disabled. | <p>Open the Silvair mobile app and go to the zone where the luminaire has been added. Select the luminaire, tap Diagnostic, and then tap Exit Inhibit state.</p> <p>If the inhibit state cannot be disabled, make sure that the luminaire is connected to power and that the power source works correctly. Collect the test results again to make sure that the luminaire is in the normal state.</p> |
| Luminaire is in the emergency state but should be in the normal state | Luminaire was not connected to power at the time of collecting the test results. | Make sure that the luminaire is connected to power. Collect the test results again to make sure that the luminaire is in the normal state. |
| Luminaire is in the extended emergency state but should be in the normal state | Luminaire was in the emergency state just before the collection of test results. | Wait and collect the test results again to make sure that the luminaire is in the normal state. |
| Luminaire is in the rest state but should be in the normal state | The rest state was enabled manually and the power is off. | Make sure that the luminaire is connected to power. Collect the test results again to make sure that the luminaire is in the normal state. |
| Battery discharged | Battery is discharged. | Connect the luminaire to power to charge the battery. If the battery is damaged, replace it. |

9. Frequently asked questions

How many emergency luminaires can be added to one zone?

One. You must [define the zones](#) so that there is only one emergency luminaire per zone. If you add two or more emergency luminaires to a zone they will be tested at the same time. If an emergency occurs during or shortly after the duration test, these luminaires will not be able to provide the emergency lighting function.

Can emergency luminaires in adjacent zones be tested at the same time?

No. Create additional schedules for duration tests so that luminaires in adjacent zones are tested at different times. If they are tested at the same time and an emergency occurs during or shortly after the duration test, they will not be able to provide the emergency lighting function.

How can I distinguish emergency luminaires from standard luminaires in the mobile app?

In the list of devices, emergency devices will have an “Emergency” label.

Can I start a test manually?

Yes. You can [start the test manually](#) in the mobile app.

How often can the test results be collected?

The test results can be collected as often as you want. When you collect test results they replace the previous results in the ELT report.

Where can I find previous test results?

Only the current test results are shown in the ELT report. The previous test results are overwritten each time the results are collected.

How can I see which devices in the building have issues?

You can [view the ELT report](#) in the web app. The report shows the area and zone where each device can be found. You can find the zone on the floor or site plan in the web app or mobile app.

Do I need a device with a battery and a real-time clock (RTC)?

No. However, we recommend that you have a device with a battery in the network to act as the source of time during a power outage. We also recommend that this device has an RTC to keep the time drift to a minimum and make sure that the scheduling is accurate. If there is no RTC, you can keep time drift to a minimum by periodically using the mobile app to [sync the time between the mobile device and the mesh network](#).

What happens after the power is restored after a power outage if there is no device with a battery?

Tests will be carried out according to the user-defined intervals, but not at the correct time. To make sure that the tests are carried out at the correct time, [sync the time in the mesh network](#).

Why are the tests carried out at different times than the scheduled time?

One reason may be that the area does not include a timekeeping device with a fully charged battery so devices in the network do not know the correct time. To make sure that the tests are carried out at the correct time, [sync the time in the mesh network](#). Another reason may be that the tests were postponed.

When can a test be postponed?

A test can be postponed when it cannot be started at the scheduled time because the battery was low or the luminaire was in a different state than normal. The devices will try to start a postponed test again every hour over the next 1–24 hours for a functional test, and every 24 hours over the next 1–4 days for a duration test.

10. Document revisions

| Revision | Date | Editor | Changes |
|----------|-------------------|--------|---|
| 3.1 | 1 March 2023 | GM | Added information about printing the ELT report to a PDF file. |
| 3.0 | 8 February 2023 | GM | Changed the workflow on how the test results are collected. Added that the duration test is considered failed if it lasted for less than 60 minutes. Added “To be collected” state. Changed “Not available” to “No response” state. Screenshot sequence corrected in Adjusting the duration test schedule . Changes in Collecting the test results , Viewing the test report , Device state , Test state , Troubleshooting , and Frequently asked questions . |
| 2.1 | 28 September 2022 | GM | “Test not done” status added. Updated screenshots on pages 6, 7, 8. Zones can be selected by clicking in the floor plan. Added recommendation to test luminaires in adjacent zones at different times. Clarified what can happen when two emergency devices are added to the same zone. Added a recommendation to use an RTC. Added information about the time drift. Updated Frequently asked questions . Editorial changes. |
| 2.0 | 21 June 2022 | GM | Added sections: Defining the zones , Scheduling the tests , Collecting the test results , Viewing the test report , Starting a test manually , Syncing the time in the mesh network . Improved sections: Troubleshooting and Frequently asked questions . |
| 1.0 | 19 August 2020 | IK | Initial draft. |

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