

# Silvair Automated Demand Response

Product card

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**SILVAIR**

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# 1. Introduction

Demand response (DR) is a set of actions taken to reduce energy use when demand exceeds supply or grid emergencies occur.

Automated demand response (ADR) programs are set up by electricity suppliers to automatically reduce demand in customer installations.

Open automated demand response (OpenADR) is a standard used by suppliers to send signals to customer installations to automatically reduce demand during DR events.

The Silvair ADR service has been certified as compliant with the OpenADR standard.

The Silvair ADR service is available on a commercial basis to customers who have used the Silvair Commissioning tools to commission their projects. It is enabled manually by Silvair for a given project at the request of the project owner.

To activate the Silvair ADR for a project, the following are necessary:

- The lighting installation has been commissioned using the Silvair Commissioning tools.
- The devices in the installation are using Silvair firmware version 2.19 or later.
- At least one Silvair Gateway has been added to the project.

## 2. Operation


The Silvair ADR service has been certified as compliant with OpenADR 2.0a and is designed for resource-constrained, low-end embedded devices that can support basic DR services. The system is based on Virtual Top Nodes (VTNs) that send messages and Virtual End Nodes (VENs) that receive them.

A VTN is a server that sends OpenADR signals to end devices or other intermediate servers. VENs are clients like an energy management system (EMS), a thermostat, or other end device that accepts the OpenADR signal from the server.

In the Silvair ADR service, the electricity supplier acts as a VTN and Silvair acts as a VEN.

The Silvair ADR service is activated for specific gateways in a project that has been commissioned using the Silvair Commissioning tools. ADR events affect all luminaires that report to that gateway.

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 No luminaires or zones can be excluded from an ADR event. All luminaires that report to a gateway for which the ADR service has been activated will respond to the ADR event.


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When a DR event is received, the Silvair Gateway sends a command to the luminaires in the project to reduce the power. Then, the light level of the luminaires that report to the gateway dim down to a level defined by the user.

An example reduction could be as follows:

- Level 1: 85% of full power
- Level 2: 85% of level 1 (that is, approximately 72% of full power)
- Level 3: 85% of level 2 (that is, approximately 61% of full power)

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 The same light level will always be applied to all zones. It is not possible to enable different light levels for different zones.

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The behavior of the system depends on the current light level and the scenario used at the time of the DR event. When the light level is above the DR limit, the behavior of the system will be different than when the light level is below it. See [Example behaviors](#) for examples.

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 There is no indicator in the web app or mobile app to show that a DR event is in progress.

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If the DR event allows a higher light level than the maximum limit defined in the scenario for the zone, the limit from the scenario will be applied.

After a DR event expires, the Silvair Gateway sends a second command to the luminaires in the project to return them to the default settings. Because these settings will be the levels defined by the automatic scenarios or schedule which may not be the same as before the DR event, the light level may change.

## 2.1 Example behaviors

Before ADR event (control scenario)	During ADR event	After ADR event
<i>Manual control and ON (that is, default light level)</i>	If the current light level is higher than the ADR limit, the lights will dim down. Otherwise there will be no change.	Lights will return to the default light level. Light level may change.
<i>Manual control and OFF</i>	No change. Lights remain off.	No change. Lights remain off.
<i>Manual control and scene A or B is set, or light level was changed by the user</i>	If the current level is higher than the ADR limit, the lights will dim down and automatic control will be turned off.	Lights will return to the default light level. If this level differs from the ADR limit or the previous user-set level, the light level may change.
Automatic control (occupancy / vacancy / daylight harvesting)	<p>If the current light level is higher than the ADR limit, the lights will dim down.</p> <p>Otherwise, automatic control continues.</p> <p>If the ON button is pressed during a DR event, the automatic control is turned on and the light level will not increase above the maximum.</p>	The lights will return to the <i>occupied</i> mode. That is, the DR event is treated as if occupancy is detected.
Automatic control (multiple scenes / scheduling)	<p>If no scenes are scheduled, scene 2 will be recalled (usually this is back to ON/Auto). And if the current light level is higher than the ADR limit, the lights will dim down.</p> <p>If scenes are scheduled and the current light level is higher than the ADR limit, the currently scheduled scene will be recalled. The controller will behave exactly as the scene defines. Scheduling will work as usual.</p> <p>In all cases at all times, the light level is reduced to the limits set by the DR event.</p>	<p>The default scene (ON or the scene due according to the schedule) will be recalled.</p> <p>The currently scheduled scene will be recalled, which may be different to what was set at the start of the DR event.</p>

## 3. Activation

The ADR service is activated by Silvair for a given project. The process is as follows:

1. Commission the project using the Silvair Commissioning tools and add at least one Silvair Gateway to the project.
2. Obtain the ADR credentials/certificates from your utility.
3. Contact Silvair support at [support@silvair.com](mailto:support@silvair.com) when you are ready to connect your installation to the service. In your email include:
  - project ID (from the Silvair web app),
  - Silvair gateway(s) serial number(s),
  - VTN URL, VEN ID, and all ADR credentials/certificates obtained from the utility,
  - reduction in light level required for each level of ADR control.
4. Silvair will configure ADR for the project, check the connection, and confirm that the activation has been completed.

## 4. Document revisions

Revision	Date	Editor	Changes
1.1	14 September 2022	ES, GM	Edits and corrections.
1.0	1 June 2021	LR, ES	Initial draft.



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