

Charge/Discharge Profile Programming through the Monitoring Portal – Application Note

Introduction

SolarEdge's StorEdge Solution can be used for various applications that enable energy independence for system owners, by utilizing a battery to store power and supply power as needed. One of the main applications of the StorEdge Solution is Charge/Discharge Profile Programming: the system operates according to a configurable charge/discharge profile, for example for time of use arbitrage (charge the battery from the PV/grid when tariffs are low and discharge the battery when tariffs are high).

A charge/discharge profile is created from a yearly calendar, repeated for 20 years as long as no profile changes are made. The yearly calendar is divided into segments, with one of seven charge/discharge modes assigned to each segment. This application note describes how to program a profile through the SolarEdge monitoring portal.

A profile comprises three components:

1. A daily profile type: defines the charge/discharge modes throughout a day. Different day types may be defined, for example, winter weekday, spring weekday, weekend, holiday, etc.
2. A seasonal profile: defines weekly profiles to use during specified periods of the year. These periods must cover the entire year. A typical use case is creating seasonal profiles corresponding to the seasonal changes of electricity rates.
3. Special day type: defines dates that should have a specific daily profile instead of the profile defined for the relevant period. For example, if you defined a seasonal profile from Dec. 15 to Jan. 15 but want the system to have a different daily profile for New Years, define a special day. Special days can be set as one-time events or as recurring events.

1. The following table describes the available modes:

Mode	Description
Off	No battery charging/discharging; can be used to extend battery lifetime by minimizing the number of shallow discharges (for example at night-time or during the winter).
Charge excess PV power	Charge the battery with PV power that is not self-consumed.
Charge from PV	Charge battery with all available PV power until it is full, and only then use PV power for self-consumption; useful when import rate is low.
Charge from PV and grid	Charge battery with all available PV power and with grid power until it is full, and only then use PV power for self-consumption; useful when import rate is very low and for StorEdge systems with backup in case a grid outage event is expected.
Discharge to maximize export	Discharge battery until the inverter reaches its AC limit; useful when export rate is high.
Discharge to minimize import	Discharge battery only for self-consumption, not for export to the grid; useful when import rate is relatively high.
Maximize self-consumption	Charge/discharge battery as needed to maximize self-consumption.

Configuring a Profile

This procedure can be completed before the system is installed or connected to the portal, that is, the site was defined in the monitoring portal but not connected.

→ To create a storage profile:

2. In the monitoring portal home page, click **My Account** and select the **Storage Profiles** tab.

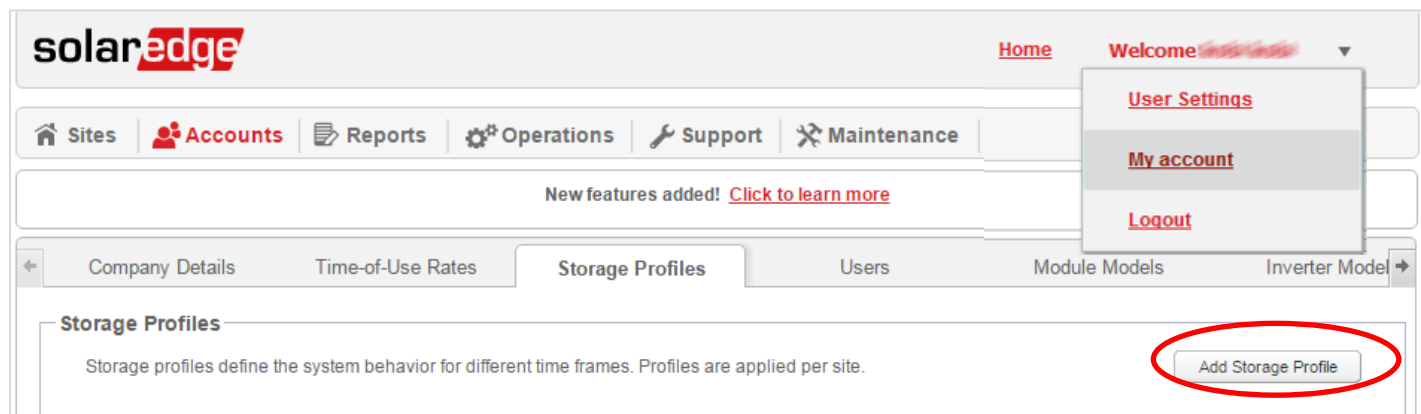


Figure 1: Storage Profiles tab and Add Storage Profile button

3. Click **Add Storage Profile**. The following window is displayed:

The screenshot shows the 'Add Storage Profile' form. It has a title 'Add Storage Profile' and a subtitle 'Storage Profiles'. The form contains several input fields: 'Name' (required), 'Country' (required, with a dropdown menu showing 'United States'), and 'Description'. Below these is a section titled 'Daily profiles' with a subtitle 'Use the daily profile to set hourly modes' and a '+ Add Daily Profile' button. This section contains a table with columns: Name, Default mode (# modes), Used in, and Delete. At the bottom of the form, there is a 'Backup reserve' field (required) with a percentage input box and a description: 'Reserve a portion of the battery capacity as backup for grid outage event'. The form ends with 'Cancel' and 'Create' buttons.

Figure 2: Add Storage Profiles

4. Fill in the profile details: name, country and optionally a profile description.
5. In the **Backup reserve** field enter the battery capacity portion to reserve for backup (in %). This is applicable only to StorEdge systems with backup.
6. Create daily profiles:
 - a. Click **Add Daily Profile Type**. The following window is displayed:

Add Daily Profile

Name:*

Description:

Default mode:*

?

Cancel

Create

Figure 3: Add Daily Profile

- b. Fill in the profile details: name and optionally a profile description.
- c. Select the profile default mode from the dropdown list. The default mode will apply to the entire day; you can then set different modes for selected timeslots.

Off

Charge excess PV power

Charge from PV

Charge from PV and grid

Discharge to maximize export

Discharge to minimize import

Maximize self-consumption

Figure 4: Profile modes

- d. Click **Create**. The Daily Profile Details window is displayed:

Daily Profile Details

Name:*

Weekend

Description:

Flat rates

Default mode:*

Maximize self-consumption

?

Mode

Change Schedule

6am

7am

8am

9am

10am

11am

12pm

1pm

2pm

3pm

4pm

5pm

6pm

Cancel

Delete

Create

Figure 5: Daily Profile Details

- e. You can set different modes for selected time slots, either by clicking **Change Schedule**, or by selecting a time slot in the window. The Change Schedule window is displayed.

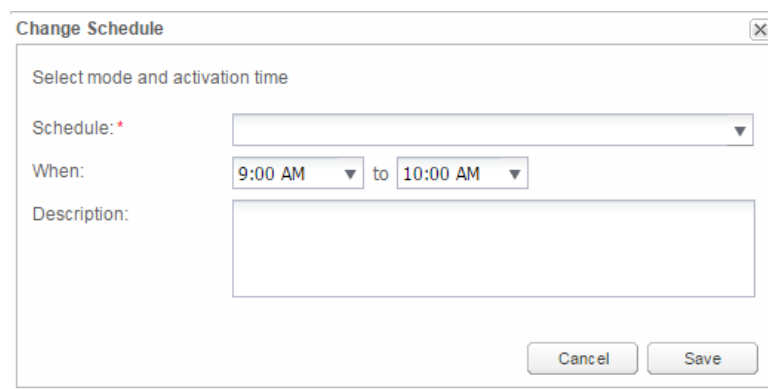
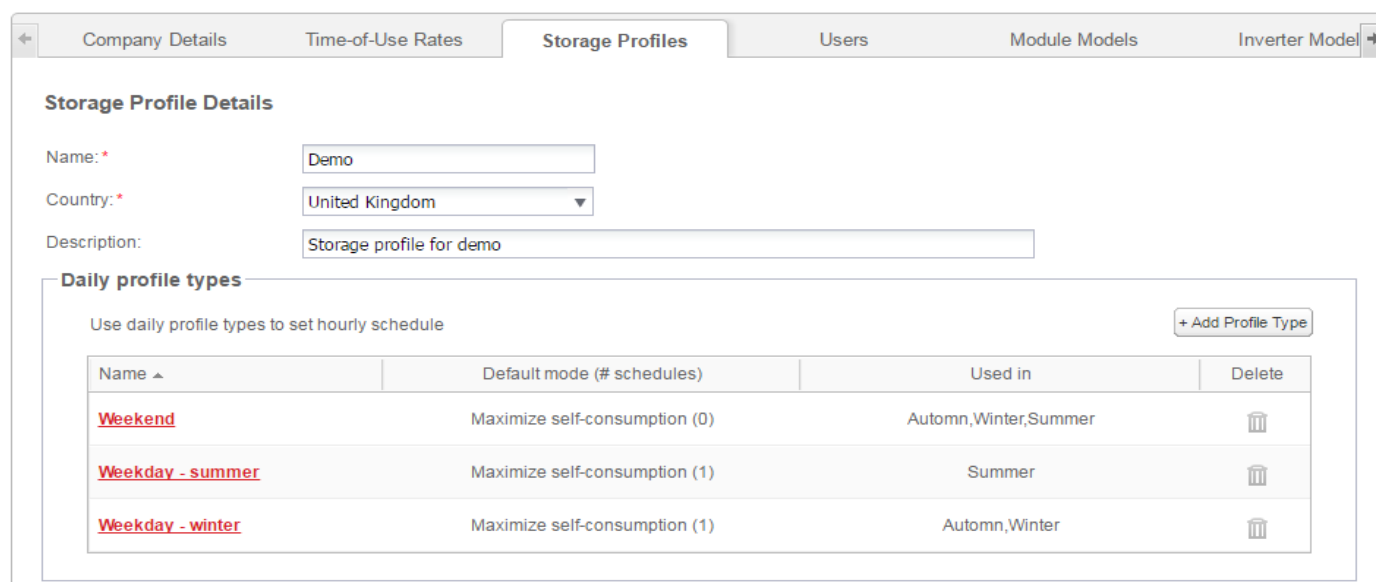
A modal window titled "Change Schedule" with a close button in the top right. It contains a label "Select mode and activation time". Below this is a "Schedule:" dropdown menu. Underneath is a "When:" section with two time pickers: "9:00 AM" and "10:00 AM", separated by "to". Below that is a "Description:" text area. At the bottom right are "Cancel" and "Save" buttons.

Figure 6: Changing the schedule in a daily profile

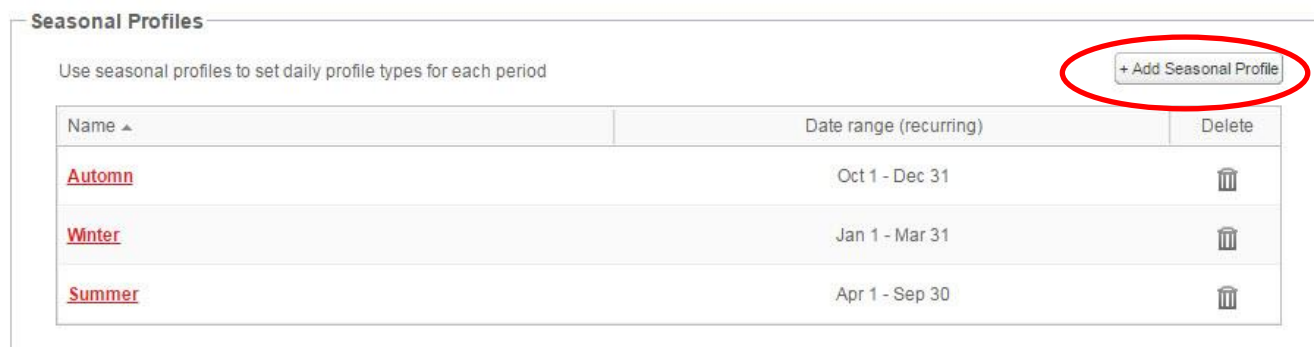
- Select the mode from the **Schedule** drop down and optionally add a description.
 - Click **Save**.
 - Click **Update** in the Daily Profile Details window.
- f. Click **Create**. The daily profile is added to the Storage Profiles window.

A screenshot of the "Storage Profiles" tab in a software interface. It shows "Storage Profile Details" for a profile named "Demo" in the "United Kingdom". Below this is a section titled "Daily profile types" with a sub-header "Use daily profile types to set hourly schedule" and a "+ Add Profile Type" button. A table lists three profile types: "Weekend", "Weekday - summer", and "Weekday - winter", each with a default mode, a count of schedules, and a list of seasons it is used in. Each row has a "Delete" button with a trash icon.

Name	Default mode (# schedules)	Used in	Delete
Weekend	Maximize self-consumption (0)	Autumn, Winter, Summer	
Weekday - summer	Maximize self-consumption (1)	Summer	
Weekday - winter	Maximize self-consumption (1)	Autumn, Winter	

Figure 7: Daily profile types

- g. To create additional daily profiles, click **Add Profile Type**. Repeat the steps above to create as many profile types as needed. For example, you can use Maximize Self-consumption mode on the weekend, Charge from PV mode in summer mornings, or Charge from PV mode in autumn noon hours.
7. Create seasonal profiles:
- a. In the Storage Profiles window, click **Add Seasonal Profile**.

A screenshot of the "Seasonal Profiles" section in the same software interface. It has a sub-header "Use seasonal profiles to set daily profile types for each period" and a "+ Add Seasonal Profile" button, which is circled in red. Below is a table with three rows: "Autumn", "Winter", and "Summer", each with a "Date range (recurring)" and a "Delete" button with a trash icon.

Name	Date range (recurring)	Delete
Autumn	Oct 1 - Dec 31	
Winter	Jan 1 - Mar 31	
Summer	Apr 1 - Sep 30	

Figure 8: Add Seasonal Profiles in the Storage Profiles window

The following window is displayed:

Seasonal Profiles

Name *

Description

Period (recurring) *

From: To:

	Monday *	Tuesday *	Wednesday *	Thursday *	Friday *	Saturday *	Sunday *
	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
6am							
7am							
8am							
9am							
10am							
11am							
12pm							
1pm							
2pm							
3pm							
4pm							
5pm							
6pm							

Cancel

Create

Figure 9: Adding Seasonal Profiles


- b. Fill in the profile details: name, optionally a profile description, and the start and end dates of the period when the profile should be used.
- c. For each day of the week, select a daily profile from the dropdown list. This weekly profile will recur each week of the defined period.
- d. Click **Create**. The profile is added to the Storage Profiles window.
- e. To create additional seasonal profiles, click **Add Profile Type**. Repeat the steps above to create as many profile types as needed.



NOTE

The seasonal profiles must cover the entire year, from Jan 1st to Dec 31st.

8. Optionally, create specific day profiles for holidays and other days requiring a different profile:
 - a. In the Storage Profiles window, click **Add Special Day**. The following window is displayed:



The 'Special Days' window is a form for creating a special day profile. It includes the following fields:

- Name:** A text input field with an asterisk indicating it is required.
- Description:** A text input field.
- Date:** A date input field with a calendar icon and a 'recurring' checkbox.
- Profile:** A dropdown menu with an asterisk indicating it is required.

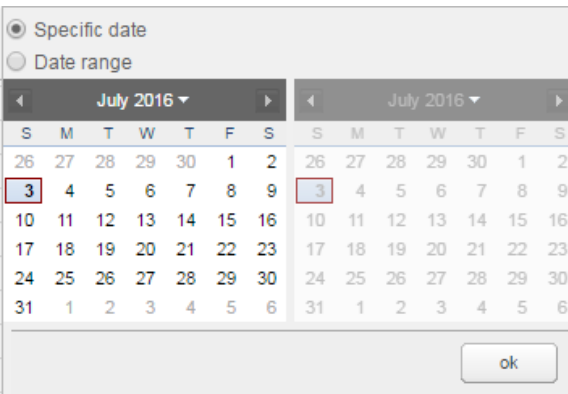
Below these fields is a table for defining the profile for each hour of the day:

Time	Profile
6am	
7am	
8am	
9am	
10am	
11am	
12pm	
1pm	
2pm	
3pm	
4pm	
5pm	
6pm	

At the bottom right are 'Cancel' and 'Create' buttons.

Figure 10: Creating a special day profile

- b. Fill in the profile details: name and optionally a profile description.
9. Click in the **Date** field. Enter a single date or click the calendar icon to select a date or a period that should be defined with the same settings.



The 'Calendar' dialog shows two calendar views for July 2016. The left view shows the full month, and the right view shows a 7-day window starting from the 26th. The date '3' is highlighted in both views. The dialog includes radio buttons for 'Specific date' (selected) and 'Date range'. An 'ok' button is at the bottom right.

Figure 11: Calendar

- a. To repeat the profile yearly, select the **recurring** check box.
 - h. Select a daily profile from the dropdown list.
 - i. Click **Create**. The profile is added to the Storage Profiles window.
10. Click **Create**. The profile is saved.

→ To edit a profile:

1. Click the profile name to open its details
2. Edit as required.
3. Click **Update**.

→ To apply a charge/discharge profile to a site:

4. In the monitoring portal site page, click **Admin** and select the **Energy Manager** tab.

Choose a site (insert at least 3 letters to search):

Dashboard Layout Chart Reports Alerts Admin

Site Details Revenue Performance **Energy Manager** Logical Layout Physical Layout

Storage profile

☒ Set profile from server

☒ Apply this profile Demo Profile

☐ Maximize self-consumption

☐ Backup only

☐ Disable StorEdge

Cancel Save

Inverter profiles

Inverter	Storage mode	Storage profile name	Last Update	Status	Log
Inverter 1 (7F10299C-54)	Storage Profile	Demo Profile			
Inverter 2 (7F19BFF2-49)	Storage Profile	Demo Profile			

Figure 12: Energy Manager tab

5. Select the **Set profile from server** check box.
6. Select **Apply this profile** and select the profile name from the drop-down list. The profile is applied to all inverters in the site.
7. Click **Save**. The Energy Manager window displays:
 - In the Storage mode column: "Storage Profile" (if you applied a profile)
 - In the Storage profile name column: The specific profile that was applied to the site, as reported by each inverter.
 The site will use the charge/discharge profile that was defined.