

# 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.

The following table describes the available modes:

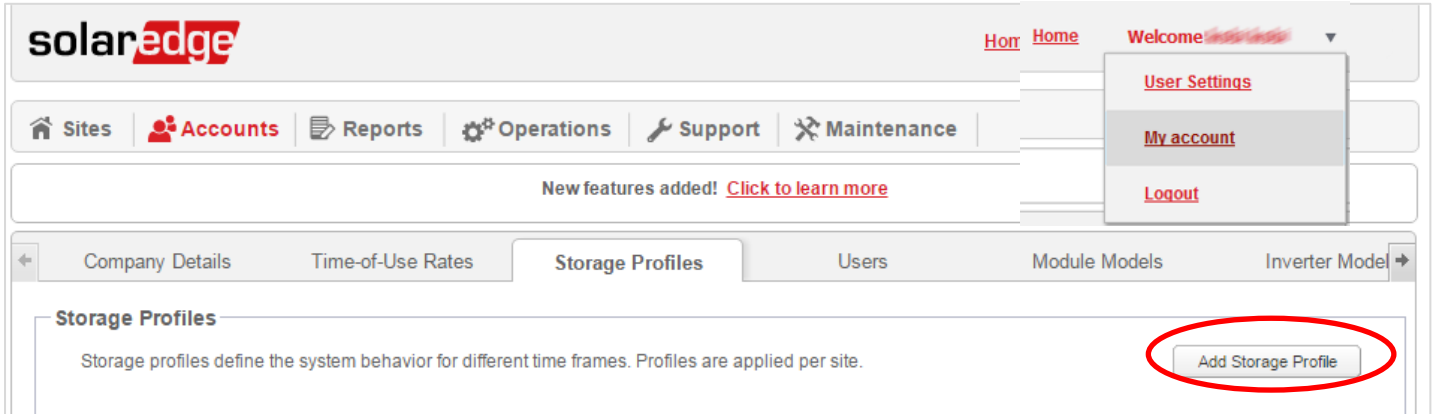
Mode	Description
<b>Off</b>	No battery charging/discharging; can be used to extend battery lifetime by minimizing the number of shallow discharges (for example at night-time or during the winter).
<b>Charge excess PV power</b>	Charge the battery with PV power that is not self-consumed.
<b>Charge from PV</b>	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.
<b>Charge from PV and grid</b>	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.
<b>Discharge to maximize export</b>	Discharge battery until the inverter reaches its AC limit; useful when export rate is high.
<b>Discharge to minimize import</b>	Discharge battery only for self-consumption, not for export to the grid; useful when import rate is relatively high.
<b>Maximize self-consumption</b>	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.

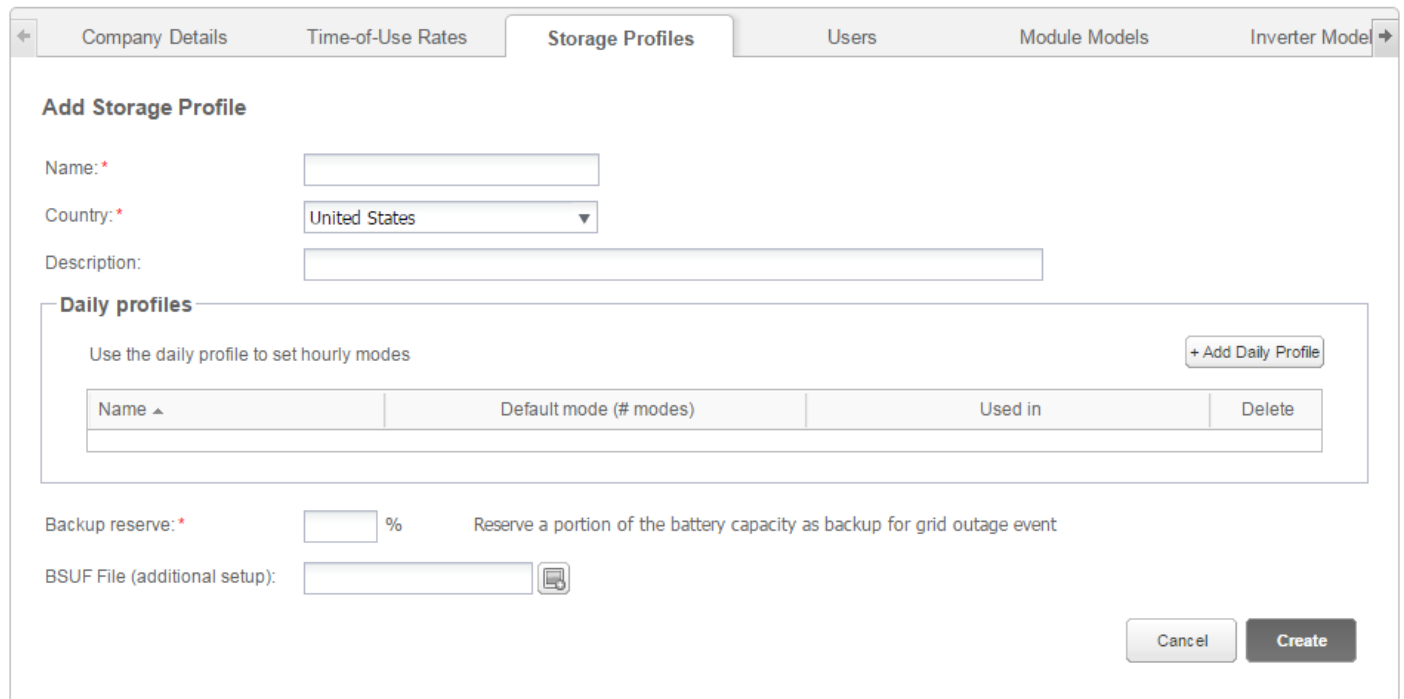
► **To create a storage profile:**

**1** 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**

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



**Figure 2: Add Storage Profiles**

**3** Fill in the profile details: name, country and optionally a profile description.

**4** In the **Backup reserve** field enter the battery capacity portion to reserve for backup (in %). This is applicable only to StorEdge systems with backup.

**5** Create daily profiles:

a. Click **Add Daily Profile Type**. The following window is displayed:

The 'Add Daily Profile' dialog box contains three input fields: 'Name:\*' (text input), 'Description:' (text input), and 'Default mode:\*' (dropdown menu). Below the fields are 'Cancel' and 'Create' buttons. A red box highlights the 'Default mode:\*' dropdown menu.

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.

The dropdown menu for profile modes includes the following options, each with a colored circular icon:

- Off (grey background)
- Charge excess PV power (green)
- Charge from PV (green)
- Charge from PV and grid (blue)
- Discharge to maximize export (orange)
- Discharge to minimize import (teal)
- Maximize self-consumption (light blue)

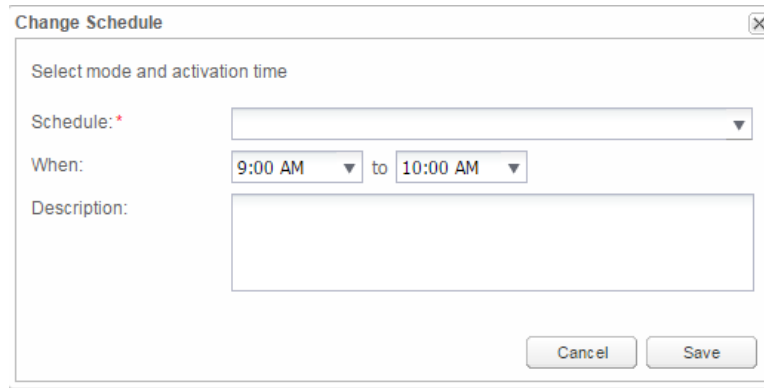
Figure 4: Profile modes

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

The 'Daily Profile Details' window shows the profile configuration. The 'Name:\*' field contains 'Weekend' and the 'Description:' field contains 'Flat rates'. The 'Default mode:\*' dropdown is set to 'Maximize self-consumption'. Below this is a 'Mode' section with a 'Change Schedule' button and a grid of time slots from 6am to 6pm. The entire grid is filled with a light blue color, indicating the selected mode. At the bottom are 'Cancel', 'Delete', and 'Create' buttons.

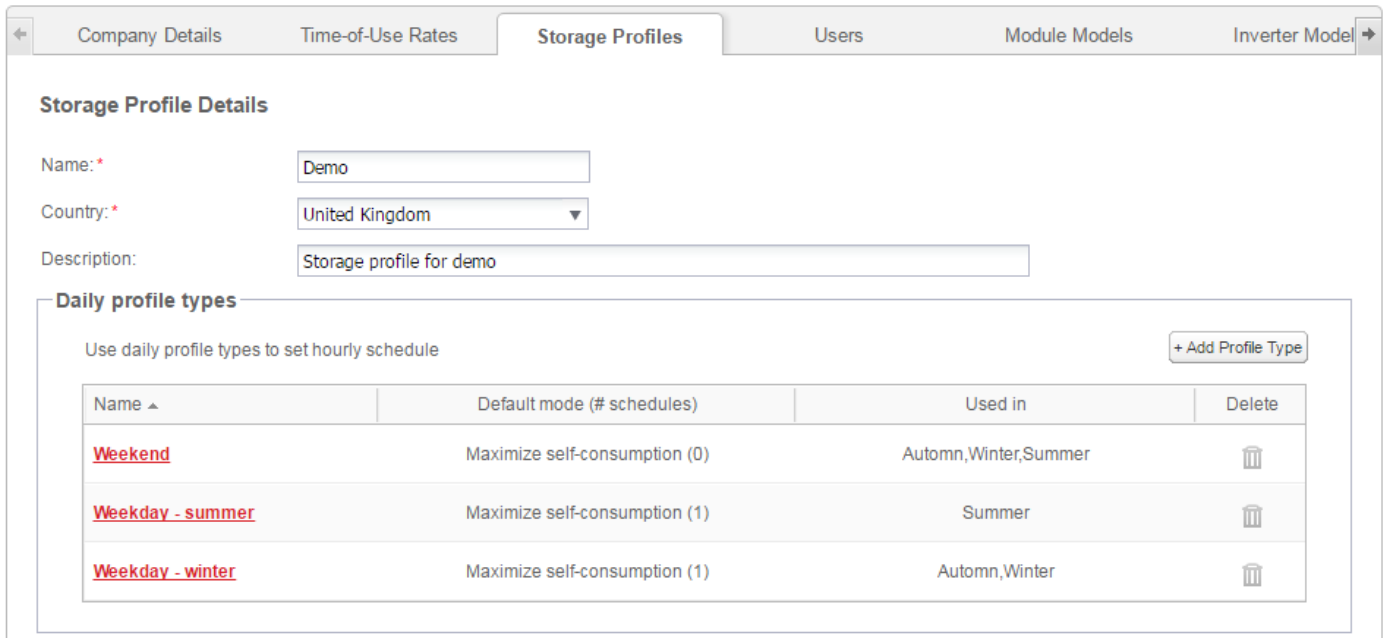
Figure 5: Daily Profile Details

- 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.



**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.

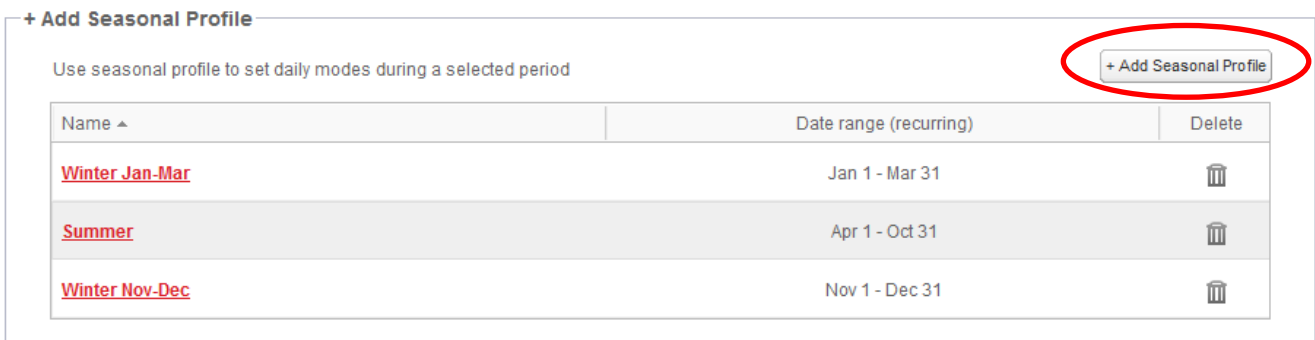


**Figure 7: Daily profile types**

- 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.

**6 Create seasonal profiles:**

- a. In the Storage Profiles window, click **Add Seasonal Profile**.



**Figure 8: Add Seasonal Profiles in the Storage Profiles window**

The following window is displayed:

The screenshot shows a window titled "Seasonal Profiles". At the top, there are input fields for "Name:", "Description:", and "Period (recurring):". The "Period" field includes "From:" and "To:" sub-fields with dropdown menus. Below this is a table with 13 rows representing time slots from 6am to 6pm in 1-hour increments. The columns represent the days of the week: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday. Each cell in the table contains a dropdown menu for selecting a profile. At the bottom right of the window, there are "Cancel" and "Create" buttons.

**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 1<sup>st</sup> to Dec 31<sup>st</sup>.

- 7 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' dialog box includes the following fields and components:

- Name:** A text input field.
- Description:** A text input field.
- Date:** A date selection field with a calendar icon and a checked **recurring** checkbox.
- Profile:** A dropdown menu.
- Time Slots:** A table with 13 rows representing hours from 6am to 6pm. Each row has a time label on the left and a large empty input area on the right.
- Buttons:** 'Cancel' and 'Create' buttons at the bottom right.

**Figure 10: Creating a special day profile**

- f. Fill in the profile details: name and optionally a profile description.
- 8 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 interface shows two views of July 2016. The 'Specific date' radio button is selected. In both calendar views, the date '3' is highlighted with a red box. The 'ok' button is located at the bottom right.

**Figure 11: Calendar**

- g. 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.
- 9 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:**

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

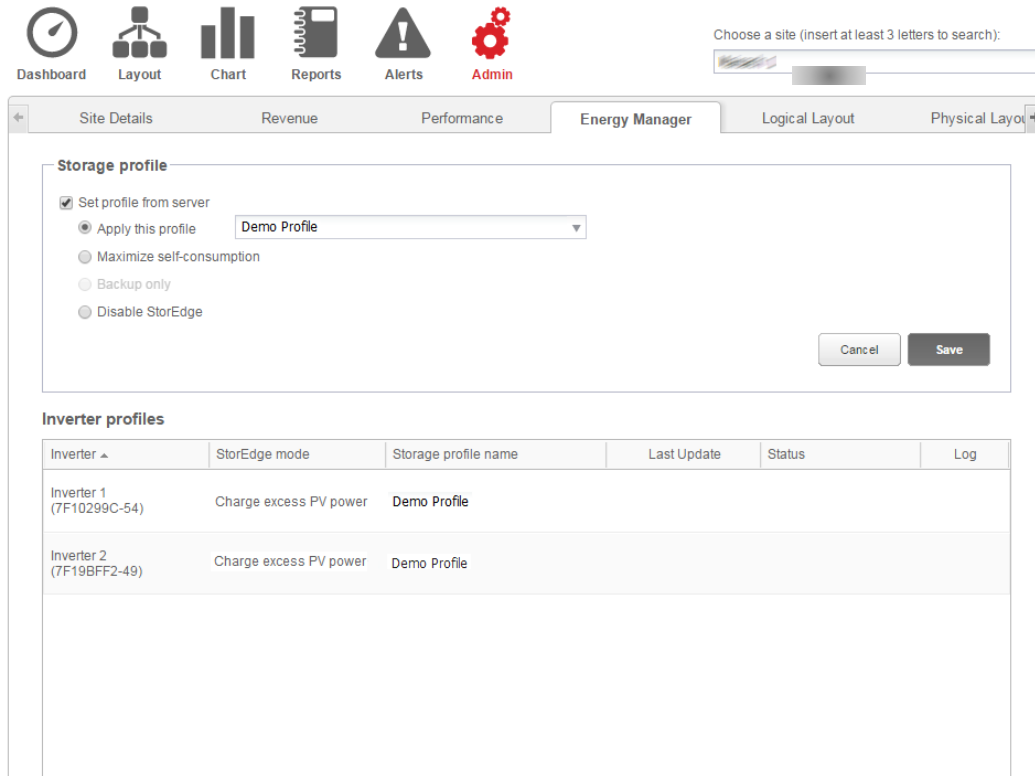


Figure 12: Energy Manager tab

- 2 Select the **Set profile from server** check box.
- 3 Select **Apply this profile** and select the profile name from the drop-down list. The profile is applied to all inverters in the site.
- 4 Click **Save**. The Energy Manager window shows the mode as reported by the inverter (typically the profile that was applied to the site). The site will use the charge/discharge profile that was defined.