User Guide

PowerChute™ Serial Shutdown v1.5 Agent

For Smart-UPS models with prefix SMT, SMX, SURTD, SRT, SMTL, SCL, SMC, and SRTL

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Introduction

PowerChute™ Serial Shutdown (PowerChute) provides UPS management, system shutdown, and energy management for devices connected to the UPS, via serial or USB interface.

In the case of a UPS critical event, the software performs a graceful system shutdown of connected devices before the UPS battery is exhausted.

Following installation, configure the software using the PowerChute initial setup wizard. This ensures that PowerChute is configured to monitor and manage your system for power events.

This document describes the options available in the PowerChute Serial Shutdown Agent user interface for a **Type A** UPS.

Supported UPS Types

During manual installation you are asked to select your UPS from a list of UPS model prefixes:

- The UPS model is found on the printed label at the rear of your UPS:
  - **Type A**

    Smart-UPS models with prefix SMT, SMX, SURTD, SRT, SMTL, SCL, SMC, and SRTL including models SRC2KUXI, SRC3KUXI, and SRC3KUXIX709.
  - **Type B**
    - Smart-UPS models excluding UPS models with prefix SMT, SMX, SURTD, SRT, SMTL, SCL, SMC, SRTL, and models SRC2KUXI, SRC3KUXI, and SRC3KUXIX709.
    - Easy Online UPS models with the SRV prefix.



Visit Knowledge Base article **FA315835** to find out more about UPS model types.

Related Documents

This document describes the PowerChute Agent web user interface:

- For information on installing PowerChute Serial Shutdown, see the **PowerChute Serial Shutdown Installation Guide**.
- For security-related information, see the **PowerChute Serial Shutdown Security Handbook**.
- For up-to-date information on the operating systems, JRE, service packs, and processors with which PowerChute Serial Shutdown is compatible, see the latest revision of **PowerChute Serial Shutdown Operating System and Processor Compatibility Chart.**

How to Log On

You can access the user interface of the PowerChute Serial Shutdown Agent in two ways, locally and remotely.

To access the PowerChute Serial Shutdown Agent on a **local** Windows computer, select the Windows **start** button, then select **PowerChute Serial Shutdown > PowerChute Serial Shutdown**.

To access the PowerChute Agent **remotely**, in a Web browser type the servername or Agent IP address and port:

```
https://servername:6547
```

```
https://agentipaddress:6547
```

For example, if your server is named COMP1, enter:

```
https://COMP1:6547
```

If you have forgotten the username or password created during installation, you can reset the credentials by using the PowerChute configuration file. See **Resetting your Username and Password**.

Account Lock-Out

PowerChute will automatically “lock out” for 2 minutes after three unsuccessful login attempts (incorrect username and/or password) to prevent brute force password cracking.

Changing Language

The PowerChute Agent User Interface (UI) is available in 7 languages: English, Chinese, French, German, Italian, Brazilian-Portuguese, and Spanish. To change the UI display language, click on the language selector in the top-right corner of the UI, and select a language from the drop-down list.

UPS Device Model

The model name of your UPS displays at the top level of these menu options, e.g. **Smart-UPS 1500**, **Smart-UPS 3000**. All of the menu options relate to your UPS.

UPS Status

The UPS Status screen has four sections — **System Status**, **Power Status**, **Battery Status**, and **Outlet Groups Status**.

Each of the sections is collapsible and expandable by clicking the – and + icon to the left of the section name.

System Status

The **Device Status** field under **System Status** indicates the present operating status of the UPS and displays one of the following states listed in the table below. **NOTE:** Possible states depend on the UPS model.

Possible Device Status	Description
On Line	The UPS is running normally on AC utility power.
On Line (Green Mode)	The UPS is running normally on AC utility power, and the electrical input is being utilized with high efficiency. In addition, the value must be above the **At runtime limit** value set on **Shutdown Settings**.
Initializing	The UPS is attempting to establish communications with the UPS.
On Battery	The UPS is using its battery to provide output power to the load.
Low Battery	The UPS is on battery, and the “Runtime Remaining” reported by the UPS is less than the **At runtime limit** value on the **Shutdown Settings** screen. By default, a **Low Battery** shutdown begins. (It is possible to reverse this setting on the **Event Configuration** screen).
Battery Discharged	The UPS is on line, and the “Runtime Remaining” reported by the UPS is less than the **At runtime limit** value on the **Shutdown Settings** screen. If you get a power outage when your battery is discharged, PowerChute immediately begins the process of gracefully shutting down your system. PowerChute can display this status immediately after a runtime calibration (which deeply discharges the battery) or when the UPS returns to On Line operation after an extended power outage. **NOTE:** It is possible to see this status when the “Battery Charge” under Battery Status on this screen is displaying as 100%. This can happen when the “Runtime Remaining” value falls below the **At runtime limit** value set on **Shutdown Settings**.
Replace Battery	The UPS battery has reached the end of its life. See **Battery Management** for more information.
No Batteries Attached	Your UPS cannot detect any batteries.

Possible Device Status	Description
UPS in Bypass*	Your UPS is in bypass mode.
Maintenance Bypass*	Your UPS is on bypass for maintenance purposes.
UPS Initiated Bypass*	The UPS is reporting an internal hardware issue that caused it to switch to bypass operation. For further information, see the support services at **www.se.com/support**.
User Initiated Bypass*	A user requested bypass operation through either the PowerChute Serial Shutdown or the UPS LCD user interface.
Bypass* Power Supply Fault	The UPS auxiliary power supply is not functioning. For further information, see the support services at **www.se.com/support**. **NOTE:** If you try to put the UPS on bypass while this condition exists, the UPS loses all output power and the connected load shuts off.
Overloaded	The UPS cannot support the current load. Unplug some equipment to reduce the load. If the UPS still indicates an overload, see the support services at **www.se.com/support**.
AVR Boost Active	The UPS is using AVR Boost (Automatic Voltage Regulator) to correct a low input voltage without switching to battery power.
AVR Trim Active	The UPS is using AVR Trim to correct a high input voltage without switching to battery power.
Performing Self Test	The UPS is performing a self test, see **Diagnostics**.
Performing Calibration	The UPS is performing a runtime calibration, see **Diagnostics**.
Sleeping	One or more outlets on your UPS are turned off but are scheduled to turn on.
Unknown	The status of the UPS is unknown.
UPS Communication Lost	The PowerChute Agent has lost communications with the UPS. Make sure that the UPS cable is securely connected at both ends.
UPS Off	Your UPS is turned off.

* While on bypass, the UPS can protect its supported equipment from power surges and minor power disturbances, but not from other power problems like a power outage.

System Status also reports the following:

Field	Description
UPS Load	In watts, the power supplied by the UPS as a percentage of its full rating.
Runtime Remaining	The amount of time the UPS — while on battery — could support the present load. The value is shown in minutes.
Internal Temperature	The temperature inside the UPS.
Load Power	In VA, volt-ampere, the power supplied by the UPS as a percentage of its full rating.
Load Current	The current drawn from the UPS by the connected equipment.

Field	Description
UPS LCD is Read-Only	**NOTE:** This field does not display for all UPS devices. This field informs you whether or not the UPS can be configured through its LCD interface. When this field value is Yes, you *cannot* configure values through the LCD user interface. (You can change this setting on the **UPS Settings** screen). Even when the value is Yes, you can still use the LCD on the UPS to: 1. Turn off the UPS with a delay. 2. Turn off immediately. 3. Reboot with a delay. 4. Reboot immediately. See also “UPS LCD is Read-Only” on **General Settings**.

Power Status

Power Status reports on the power voltage and frequency of your UPS.

Battery Status

Battery Status reports the following:

Field	Description
Battery Charge	The present charge of the UPS battery, as a percentage of the total possible capacity.
Battery Voltage	The present voltage of the UPS battery.
Total Battery Packs	This is only reported for some UPS types. It states the number of battery packs connected to your UPS.

Outlet Groups Status

Outlet Groups Status shows the name and present status of each outlet group on your UPS.



See **Outlet Setup**, **Outlet Sequence**, and **Outlet Control** for further information on outlet groups.

Outlet Setup

On this screen, you specify the outlet group that supplies power to the server with the PowerChute Agent. (This screen is also part of the shutdown configuration accessible through **Initial Setup**).



Specifying the outlet that supplies power to the server with the PowerChute Agent is **very important** for graceful shutdown.

Any delays set under the **Operating System and Application Shutdown section** in the **Shutdown Settings** screen will only apply to the outlet group supplying power to the server running the PowerChute Agent.

You can change the outlet group supplying power to the server with PowerChute Agent at any time. Be aware though that this can impact scheduled shutdowns and the sequencing of turn offs and turn ons of outlet groups and their loads. See **Scheduled Shutdown** and **Outlet Sequence**.

NOTE: The selected outlet group is always included in a shutdown sequence triggered by an event, or via the **Shutdown Now** page. If you change the outlet group supplying power to the server, the previously specified outlet group will remain included in the shutdown sequence. To remove an outlet group from a shutdown sequence, see **Outlet Sequence**.

The PowerChute logo, , displays beside the outlet group with the PowerChute Agent after you select it.

You can also name your outlet groups on this screen, using US-ASCII characters only, codes 32-126.

Battery Management

Use this screen to view the present status of your UPS batteries. The screen also lists information on your battery packs including the part numbers, and can predict when your batteries need replacing.

Some fields described in this section do not display for every UPS and configuration.

For more information, see **Battery Management for SRT/SMTL Model UPS units**.

Field	Description
Battery Status	The possible values here are **Normal**, **Replace Battery**, and **No Batteries Attached**. If you need to replace your battery, see **Battery Part Number** below.
Battery Charge	The present charge of the UPS battery, as a percentage of the total possible capacity.
Battery Voltage	The present voltage of your UPS battery (as distinct from AC utility power) in volts DC.
Runtime Remaining	The amount of time the UPS battery could support its load.
Number of Times on Battery	This value does not display for all UPS devices. The number of times the UPS battery supplied power to your system during AC utility power outages.
Total Time on Battery	This value does not display for all UPS devices. The total amount of time the UPS battery supplied power to your system during AC utility power outages.
Battery Part Number	This part number is essential for re-ordering.Click on the **Re-Order Battery** link to go to a web page where you can buy a new battery for your UPS online. If a part number is not shown for your UPS device, the **Re-Order Battery** link will take you to a web page where you can enter your UPS model number to find the correct replacement battery for your device.

Predicting the replacement date of your UPS battery

The **Predictive Battery Replacement** section of this Battery Management screen can help ensure your battery is in good working order by notifying you when your UPS battery is nearing the end of its life.

Field	Description
Battery Installation Date	This displays the date that your UPS battery was installed. For some UPS devices, this information is derived from the UPS itself. For other devices you can input an installation month and year.

Field	Description
Predicted Replacement Date	This date is supplied by the UPS and indicates when it is recommended that the battery be replaced.

Internal and External Battery Packs

For some UPS devices only, the collapsible sections named **Internal Battery Packs** and **Battery Packs** give up-to-date information on the number of battery packs installed within the UPS itself and the number of external battery packs attached to the UPS.

If PowerChute cannot identify an internal battery pack, the battery pack information will be displayed in the **Battery Packs** section.

For certain UPS models, the number of battery packs can be edited via the PowerChute Agent web interface. The range of values permitted for **Total Battery Packs** is 0-99. Changing the total number of battery packs changes the UPS “Runtime Remaining” on the UPS Status screen.

NOTE: Total Battery Packs must reflect the number of physical battery packs connected to the UPS, or unexpected behavior may occur.

Battery Management for SRT/SMTL Model UPS units

For SRT and SMTL model UPS units, use this screen to view the present status of your UPS battery cartridges. The screen also lists information on your internal and where relevant external battery packs, and can predict when your batteries need to be replaced.

There are two types of Battery Pack:

- Internal Battery Pack - a battery pack that is internal to the UPS. Internal battery packs contain one battery cartridge.
- External Battery Pack - a battery pack that resides outside of the UPS unit. External battery packs can contain two battery cartridges per battery pack. External Battery Packs are displayed in the Battery Packs section of the PowerChute UI.

Some of the fields detailed below will not be displayed unless a minimum load of 10% is connected to the UPS.

Battery Charge

The charge of all UPS batteries present, as a percentage of the total possible capacity. This field will display **No Batteries Attached** if all UPS batteries are disconnected.

Battery Voltage

The voltage of all UPS batteries present (as distinct from AC utility power) in volts DC. This field will display **No Batteries Attached** if all UPS batteries are disconnected.

Runtime Remaining

The amount of time the UPS batteries present can support its load. When additional batteries are added to the UPS, the Runtime Remaining value will increase. The Runtime Remaining value is set to 0 when all UPS batteries are disconnected.

Firmware Revision

The firmware version of the UPS Battery Pack. **NOTE:** This value does not display for all UPS devices.

Battery Pack - SKU

The SKU of the External Battery Pack.

Battery Pack Condition

This indicates the health of the External Battery Pack. For health status of the Cartridges within the Battery Pack, see “Battery Status”.

Possible values include:

Status	Description	Action
Normal	Battery is in normal state	No action required.
General Error	The Battery Pack is reporting a non-specific error.	Go to the **Schneider Electric website**, or contact your local Customer Care Center for more information.
Communication Error	There is a communication issue between the Battery Pack and the UPS.	Go to the **Schneider Electric website**, or contact your local Customer Care Center for more information.
Disconnected Battery Pack	The Battery Pack is disconnected.	Check that the battery pack is connected correctly. Go to the **Schneider Electric website**, or contact your local Customer Care Center for more information.
Firmware Mismatch	There is a mismatch between the Battery Pack Firmware and the UPS Firmware.	Go to the **Schneider Electric website**, or contact your local Customer Care Center for more information.
Overtemperature Warning	The battery temperature has exceeded the warning threshold.	Go to the **Schneider Electric website**, or contact your local Customer Care Center for more information.
Overtemperature Critical	The battery temperature has exceeded the critical threshold.	Do not attempt to use the UPS. Turn off the UPS and have it serviced immediately. Go to the **Schneider Electric website,** or contact your local Customer Care Center for more information.
Temperature Sensor Fault	There is an error in the temperature sensor.	Go to the **Schneider Electric website**, or contact your local Customer Care Center for more information.

Battery Status

Possible values include:

Status	Description
Normal	The battery is in a normal state.
No Batteries Attached	The battery is disconnected.
Battery near end of life	The battery will soon need to be replaced. See **This date is supplied by the UPS and indicates when it is recommended that the battery be replaced.**.

Status	Description
Battery lifetime exceeded	It is recommended that the battery is replaced. See **Order Battery Packs**.
Replace Battery	The battery needs to be replaced. See **Order Battery Packs**.
Battery lifetime alarm acknowledged	An alarm to indicate that the battery will need to be replaced or is near end of life has been acknowledged through the LCD screen of the UPS unit. See **Order Battery Packs**.

Battery Installation Date

This displays the date that your UPS battery was installed. For SRT model UPS units, this information is derived from the UPS itself. You can change the date by entering new month and year values.

Predicted Replacement Date

This date is supplied by the UPS and indicates when it is recommended that the battery be replaced.

Order Battery Packs

Use this section to order new Battery Packs:

Field	Description
Replacement Battery	The SKU of the Battery Pack in your UPS is displayed. Click on the **Re-Order Battery** link to open a web page where you can buy a new battery for your UPS.

Diagnostics

The Diagnostic screen displays the last diagnostic results, and enables you to initiate tests and calibrations.

There are three types of diagnostics:

- a **self test** performs internal UPS diagnostics
  NOTE: If the UPS is On Battery, a self test cannot be performed. Restore power to the UPS to run a self test.
- an **alarm test** of your UPS.
- a **runtime calibration** causes the UPS to recalculate its available runtime capacity based on its present load. This ensures that the runtime reported is more accurate. Not all UPS models support runtime calibration. See “Notes on Runtime Calibration” below.

You can initiate an immediate self test, a calibration, or a UPS alarm test by selecting an option in the drop-down box under the **Initiate Diagnostics** section and clicking on Apply.

Notes on Runtime Calibration

- Runtime calibrations deeply discharge UPS batteries, which can leave a UPS temporarily unable to support its equipment if a power outage occurs.
- You can perform a calibration only if battery capacity is at 100%.
- The load on your UPS must be at least 10% without fluctuating to guarantee that a calibration will be accepted. This percentage varies based on UPS model, and will be higher if you have external batteries; the percentage value will vary depending on the number and the type.
- To optimize the efficacy of the runtime calibration, it is recommended to perform the calibration using a connected device load that accurately represents the average load on the UPS.
- Frequent calibrations reduce the life of batteries. Therefore, select runtime calibrations to occur only annually or semi-annually. Also perform a calibration whenever you significantly change the load that the UPS is supporting.

In the Schedule Self Test section, you can configure your system to perform a self test at frequencies available in the drop-down box, explained in the table below.

Field	Description
On UPS start-up	The UPS performs a self test when it turns on.
On UPS start-up and every 7 days since start-up date	The UPS performs a self test when it turns on and subsequently performs a test every 7 days. (The dates do not deviate from the 7-day interval unless you turn the UPS off and then on again). **For example**, you turn on the UPS on September 3, so it performs a self test at turn-on and subsequently on Sept. 10, Sept. 17, Sept. 24, etc.
On UPS start-up and every 14 days since start-up date	The UPS performs a self test when it turns on and subsequently performs a test every 14 days. See the example in the row above.
On UPS start-up and every 7 days since last test	The UPS performs a self test when it turns on and subsequently performs a test every 7 days. However, if you manual initiate a self test, using this screen or directly on the UPS, this changes the dates (in contrast to the second item in the drop-down box where the dates would not change). For example, you turn on the UPS on September 3, so it performs a self test at turn-on and subsequently on Sept. 10. You then initiate a manual self test on Sept. 12, and the 7-date intervals continue on Sept. 19, Sept. 26, etc.
On UPS start-up and every 14 days since last test	The UPS performs a self test when it turns on and subsequently performs a test every 14 days. However, if you manual initiate a self test, using this screen or directly on the UPS, this changes the dates. See an example in the row above.

The UPS reports the following values for status:

Test Status	Description
In Progress	The diagnostic test is ongoing.
Passed	The self test passed. This is not relevant for the other tests: alarm test and calibration
Failed	Your self test, alarm test, or calibration did not succeed.

Test Status	Description
Refused	Your UPS refused the diagnostic test. For a calibration, this will happen when the load on the UPS is less than 10% of its full capacity. In addition, for a calibration the UPS battery must be fully charged.
Aborted	Your self test, alarm test, or calibration could not run to completion because something stopped it, for example, a power outage, or it was canceled by a user.
Completed	Your runtime calibration has finished successfully.
Unknown	The status of your diagnostic test is unknown. This could be caused by a communication issue.

UPS Settings

Use this screen to configure UPS values and thresholds, for example, output voltage and a maximum internal temperature.

The options explained below do not display for all UPS devices. Only supported options will be displayed for your UPS model.

Power Settings

Field	Description
Output Voltage[a]	The voltage the UPS will supply when operating on battery power. **NOTE:** For some UPS models, you can only change this setting on the UPS directly.
Upper Bypass Limit[b]	When operating in bypass, this is the highest voltage the UPS will supply to the connected load.
Lower Bypass Limit	When operating in bypass, this is the lowest voltage the UPS will supply to the connected load.
High Transfer Voltage	On UPS devices that do NOT support bypass, this is the *highest* voltage the UPS will supply to the connected load. **NOTE:** On UPS devices that support AVR Trim, it will be reported when the Input Voltage is higher than this value.
Low Transfer Voltage	On UPS devices that do NOT support bypass, this is the *lowest* voltage the UPS will supply to the connected load. **NOTE:** On UPS devices that support AVR Boost, it will be reported when the Input Voltage is lower than this value.
Sensitivity	The sensitivity of the UPS to distortions in the line voltage.

a
If you change the Output Voltage setting, the UPS sometimes changes the Upper and Lower Bypass Limit values, also displaying on this screen. When that happens, these fields become read-only. Check these values after you set output voltage.

b
If the supported equipment can tolerate a wide voltage range for On Line operation, you can increase the Upper Bypass Limit value and decrease the Lower Bypass Limit value. A wider voltage range reduces the number of times the UPS switches to battery operation, especially in areas where the input voltage is unstable or is chronically high or low.

General Settings

The options explained below do not display for all UPS devices. Only supported options will be displayed for your UPS model.

Field	Description
UPS Name	A user-customizable name for the UPS. You can use US-ASCII characters only, codes 32-126. **NOTE:** Depending on the UPS type, a maximum of between 8 to 16 alphanumeric characters is allowed. The PowerChute Server Description in the top-left corner of the UI defaults to the UPS Name. This description is user-customizable and if edited, it will override the UPS Name.
UPS LCD is Read-Only	This field does not display for all UPS devices and firmware. Choose **Yes** or **No** from the drop-down box to determine whether a user can configure the UPS through its LCD interface. When this field value is Yes, you *cannot* configure values through the LCD user interface. The default is No. Even when the value is Yes, you can still use the LCD on the UPS to: • Turn off the UPS with a delay. • Turn off immediately. • Reboot with a delay. • Reboot immediately. Setting the UPS LCD to read-only and turning off the outlet group with the PowerChute Agent will necessitate a UPS reboot to turn the outlet group back on[a]. **NOTE:** • The ability to set your UPS LCD to read-only depends on your UPS firmware version. • Regardless of this LCD setting, if you can access this PowerChute user interface, you can configure the values.
UPS Output Load Threshold	Each UPS has a maximum rating, for example, 1500 VA. Use this field to set the preferred highest percentage of this rating used by the load. For example if this threshold is set to 70(%), when the load consumes more then 1050 VA (70% of 1500), the **Output Load Threshold Exceeded** event is generated.

Field	Description
High Internal Temp Threshold	When this temperature is exceeded, an **UPS Internal Temperature Threshold Exceeded** event is generated. (By default, this event causes a shutdown). This temperature should be greater than (or at least equal to) the **High Internal Temp Warning Threshold** in the row below. **NOTE**: Set this value above the normal temperature range of the UPS. If you don't, the Internal Temperature Exceeds Critical Range event will be continually generated. To troubleshoot this, see **UPS Internal Temperature Threshold Exceeded**.
High Internal Temp Warning Threshold	When this temperature is exceeded, a **UPS Internal Temperature Warning** event is generated.

a
One specific outcome could be as follows:

1. Set the LCD to read-only.
2. Use the PowerChute Outlet Control screen to shut down (without reboot) the outlet providing power to your server with the PowerChute Agent installed.
3. You cannot subsequently turn on that outlet manually (as the LCD is read-only).
4. Furthermore, because the PowerChute outlet is turned off, the Agent interface is unavailable, so you cannot change the LCD read-only setting.
5. To turn the outlet group back on, you need to restart your UPS manually, which means that every device temporarily loses power.

Alarm Settings

Field	Description
Audible Alarm	With this field, you can enable or disable the UPS audible alarm that sounds in response to power problems. On the top right of your screen, one of the following four alarm icons displays:  The alarm is enabled.  The alarm is currently in operation.  The alarm is disabled.  Your system has lost communications with your UPS.

Bypass Settings

The UPS can be placed into bypass mode for maintenance.

The options explained below do not display for all UPS devices. Only supported options will be displayed for your UPS model.

Mains Input Condition

When the UPS is in bypass, it cannot support its load if a power outage occurs.

To place the UPS in bypass, the input voltage to the UPS must fall between the upper and lower bypass limits.

Possible values include:

Status	Description
Acceptable	Input voltage is within the bypass limits. The UPS can be placed into bypass mode.
Pending Acceptable	Input voltage is marginally outside the bypass limits.
Voltage Too High	Input voltage is above the upper bypass limit.
Voltage Too Low	Input voltage is below the lower bypass limit.
Distorted	Input voltage is distorted.
Frequency Too Low	The frequency of the mains input is too low to allow bypass. Check the UPS LCD for the acceptable bypass frequency.
Frequency Too High	The frequency of the mains input is too high to allow bypass. Check the UPS LCD for the acceptable bypass frequency.
Frequency and Phase not locked	The Frequency and Phase of the mains input is not locked.

Select Bypass Action

Action	Description
Put in Bypass	This option is available when the UPS is not in bypass mode.
Return from Bypass	This option is available when the UPS is in bypass mode.

Event Configuration

The **Event Configuration** screen lists the events that can occur and separates them into three categories - critical (severe), warning, and informational. You cannot change an event's category.

By default, the Informational events are hidden, click the **+** icon beside **Informational** to display them. You can also click the **-** sign to hide any of the three categories.

You can configure events to cause certain actions, named in separate columns:

- **Logging**: Records the event in the Event Log when the checkbox is selected.

You can disable all logging, see **Log Settings**.

- **E-Mail**: Sends an e-mail message to users and administrators when an event occurs. The checkbox must be selected to enable this. E-mail must be configured in PowerChute, see **E-Mail Settings**.
- **Shutdown**: Initiates an operating system shutdown sequence in response to an event when the checkbox is selected. See **Shutdown**.

IMPORTANT: Changing the shutdown and command file options for events has a direct effect on the configuration you specify on the **Shutdown Settings** page. See **Power Outage Configuration and Shutdown on Event Configuration**.

- **Command File**: Runs a user-specified command file when an event occurs.

Command files are often used to shut down open applications in order to avoid loss of data. They have to be placed in this folder:

```
<Installation folder>\APC\PowerChute Serial Shutdown\agent\cmdfiles
```

which for example is, by default on Windows, this folder:

```
C:\Program Files\APC\PowerChute Serial Shutdown\agent\cmdfiles
```

Click on the Command File icon to enable it, and choose a file to run and a duration.

All command file types are supported.

IMPORTANT: PowerChute does not check the contents of a command file before executing it.

When you have enabled a command file for an event, the icon color changes from grey, , to green,  .

See also **Command file durations and shutdowns** and **Power Outage Configuration and Shutdown on Event Configuration**.

Some events cannot be configured to trigger certain actions and have no checkbox for that action. For example, most informational events cannot cause a shutdown so the checkbox is missing in the Shutdown column for those events.

Description of events

For descriptions of individual events, see:

- **Critical events**
- **Warning events**
- **Informational events**



The events that display depend on your UPS, some events described below might not display for your UPS.

Critical events

Critical (severe) events can cause the UPS to stop supplying power to its supported equipment. These events require your immediate attention.

Event Name	Description
Communication Lost While on Battery	A problem occurred causing PowerChute to lose communication with the UPS while the UPS was operating on battery power. Make sure that the proper communications cable is being used and that it is connected correctly.
UPS Internal Temperature Threshold Exceeded	The internal temperature of the UPS has exceeded the user-configured threshold. This causes a shutdown which cannot be canceled, even if the internal temperature returns to normal. You can set this threshold in the **High Internal Temp Threshold** under **UPS Settings**. After this event occurs, to prevent it occurring repeatedly, when you log onto the machine with the Agent installed, you must stop the Agent service immediately. You should disconnect your UPS and wait for the temperature to cool down. See “Starting and Stopping the PowerChute Agent” in the **Installation Guide** available on the **Schneider Electric website**.
Low Battery	A UPS *that is operating on battery power* has reached the low runtime threshold - the **Runtime Remaining** reported by the UPS is less than the **At runtime limit** value on the **Shutdown Settings** screen.

Warning events

Warning events alert you to situations that should be monitored

Event Name	Description
On Battery	The UPS has switched to battery operation due to a power outage or poor power quality.
Battery Discharged	An On Line UPS has reached the low runtime threshold. If a power outage occurs, a shutdown will begin immediately. The low runtime threshold indicates that the **Runtime Remaining** reported by the UPS is less than the **At runtime limit** value on the **Shutdown Settings** screen.

Event Name	Description
Overload	The UPS cannot support the current load. It is at 105% or more of its maximum capacity. (This percentage varies between UPS devices and can be as high as 110%). If the overload was not caused by adding new load equipment, do the following: 1. Run a UPS self test to see if the problem clears. 2. If the problem persists, disconnect all equipment from the UPS and reboot the UPS. 3. If the problem is cleared, reconnect and turn on the load equipment, one piece at a time, to determine which piece of equipment causes the overload. If the overload still exists, the UPS needs to be repaired or replaced. For further information, see the support services at **www.se.com/support**.
Self Test Failed	The UPS did not pass its last self test. It might have a bad battery. If the system is reporting an **Insufficient Runtime Available** or an **Overload** condition, clear the event and test the UPS again. If the self test fails again, see the support services at **www.se.com/support**.
Communication Lost	Communication between PowerChute and the UPS has been lost while the UPS was On Line. Make sure that the proper communications cable is being used and that it is connected correctly. See also **Communication Lost While on Battery**.
Time on Battery Threshold Exceeded	The UPS is on battery and has breached the user-configured threshold. Specifically, the time that the UPS has been on battery exceeds the **After UPS has been on battery for** value on the **Shutdown Settings** screen.
Output Load Threshold Exceeded	The UPS has exceeded the user-defined load threshold. See **UPS Output Load Threshold** on **UPS Settings**. This threshold event can be seen as a warning. The UPS itself determines when the UPS is actually overloaded and this generates another more serious event, see **Overload**.
Insufficient Runtime Available	The UPS is On Line and is below the low runtime threshold - the **Runtime Remaining** reported by the UPS is less than the total turn-off delays for the outlet group supplying power to the Agent. This outlet group is designated by the PowerChute logo on the **Outlet Sequence** screen, see **Using the graph and common fields**. In a forced shutdown, the UPS might not have enough runtime available to perform a graceful shutdown.

Event Name	Description
Low Runtime Available	The UPS is on battery and is below the low runtime threshold - the **Runtime Remaining** reported by the UPS is less than the total turn-off delays for the outlet group supplying power to the Agent. This outlet group is designated by the PowerChute logo on the **Outlet Sequence** screen, see **Using the graph and common fields**. In a forced shutdown, the UPS will NOT have enough runtime available to perform a graceful shutdown.
Battery Needs Replacing	One or more UPS batteries need to be replaced. See **Battery Management**.
UPS Internal Temperature Warning	The warning threshold in place for your UPS internal temperature has been exceeded. See **High Internal Temp Warning Threshold**.
Bypass Internal Fault	The UPS has reported an internal hardware problem.
AVR Boost Enabled	The UPS began using AVR Boost to correct a low voltage condition.
AVR Trim Enabled	The UPS began using AVR Trim to correct a high voltage condition.
Battery Disconnected	The battery in your UPS has been disconnected or removed. Reconnect the battery. If this does not clear the problem, see the support services at **www.se.com/support**.
Frequent Overvoltage	The UPS has been using its AVR Trim feature to decrease a high input voltage more than five times during the last 24 hours, or more than fifteen times during the last seven days. This may indicate that the quality of the input voltage provided to the UPS needs to be improved. This event will resolve when the input voltage returns to normal, or the input voltage becomes too high to be gracefully decreased (**On Battery** event). If the devices connected to the UPS can accept a less sensitive input power quality, configure the UPS to use the AVR Trim feature less frequently, by setting **High Transfer Voltage** to its highest setting, and the **Sensitivity** to **Low.**
Frequent Undervoltage	The UPS has been using its AVR Boost feature to increase a low input voltage more than five times during the last 24 hours, or more than fifteen times during the last seven days. This may indicate that the quality of the input voltage provided to the UPS needs to be improved. This event will resolve when the input voltage returns to normal, or the input voltage becomes too low to be gracefully increased (**On Battery** event). If the devices connected to the UPS can accept a less sensitive input power quality, configure the UPS to use the AVR Boost feature less frequently, by setting the **Low Transfer Voltage** to its lowest setting, and the **Sensitivity** to **Low**.

Event Name	Description
Extended Overvoltage	The UPS has been using its AVR Trim feature to decrease a high input voltage continuously for at least one hour. This may indicate that the quality of the input voltage provided to the UPS needs to be improved. This event will resolve when the input voltage returns to normal, or the input voltage becomes too high to be gracefully decreased (**On Battery** event). If the devices connected to the UPS can accept a less sensitive input power quality, configure the UPS to use the AVR Trim feature less frequently, by setting the **High Transfer Voltage** to its highest setting, and the **Sensitivity** to **Low**. Contact **Schneider Electric Support** for information on how to improve the quality of UPS input power.
Extended Undervoltage	The UPS has been using its AVR Boost feature to increase a low input voltage continuously for at least one hour. This may indicate that the quality of the input voltage provided to the UPS needs to be improved. This event will resolve when the input voltage returns to normal, or the input voltage becomes too low to be gracefully increased (**On Battery** event). If the devices connected to the UPS can accept a less sensitive input power quality, configure the UPS to use the AVR Boost feature less frequently, by setting the **Low Transfer Voltage** to its lowest setting, and the **Sensitivity** to **Low**. Contact **Schneider Electric Support** for information on how to improve the quality of UPS input power.
Invalid Configuration File	The contents of the `pcssconfig.ini` file are invalid. Open the `pcssconfig.ini` file using a text editor (e.g. Notepad) to view and resolve the errors.
Invalid User Login	A user has unsuccessfully attempted to log in to the PowerChute user interface. **NOTE:** PowerChute will automatically “lock out” for 2 minutes after three unsuccessful login attempts (incorrect username and/or password) to prevent brute force password cracking.

Informational events

Informational events report data about the operation of the UPS device.

Event Name	Description
On Line (Green Mode)	Your UPS has begun operating in green mode: it is running normally on AC utility power, and the electrical input is being utilized with high efficiency. **NOTE:** Some UPS devices can incorrectly signal they are in this mode when the internal battery is disconnected.
No Longer On Battery	AC utility power has been restored; the UPS is no longer running on battery power. This event follows **On Battery**.
Overload Solved	The overload condition has been corrected. See **Overload**.
Output Load in Range	The UPS load out-of-range condition has been corrected. See **Output Load Threshold Exceeded**.
Shutdown Starting **Shutdown in Progress**	Various stages of the shutdown procedure.
Calibration Started **Calibration Complete** **Calibration Canceled**	Various stages of a runtime calibration. A calibration cancellation can be caused by either a user or a power outage. See **Diagnostics**.
Communication Established	PowerChute has established communication with the UPS.
Monitoring Started **Monitoring Stopped**	PowerChute has started or stopped monitoring the UPS.
Sufficient Runtime Available	This event follows **Insufficient Runtime Available**. Your UPS now has enough runtime available to perform a graceful shutdown.
Administrative Shutdown Scheduled	You have commanded a shutdown to start soon. This event is shown either ten minutes before a scheduled shutdown is due to occur, or when a shutdown has been created in the Shutdown Now screen. An administrative shutdown is caused by a user rather than an event such as a power outage. See **Shutdown**.
Administrative Shutdown Pending	A shutdown will start after the user-specified delay has expired. This delay is specified in the Scheduled Shutdown screen, or under 'Begin OS Shutdown Sequence In' in the Shutdown Now screen. See **Shutdown**.
Administrative Shutdown Canceled	Cancel Server Shutdown was selected by the user and the shutdown process was aborted. An administrative shutdown is caused by a user rather than an event such as a power outage. See **Shutdown**.
Self Test Initiated **Self Test Passed**	The UPS has started or passed its internal diagnostic self test. See **Diagnostics** for details of the date and status of the self test.
AVR Boost No Longer Active	The UPS no longer needs to use AVR Boost to correct a low voltage condition. This event follows **AVR Boost Enabled**.
AVR Trim No Longer Active	The UPS no longer needs to use AVR Trim to correct a high voltage condition. This event follows **AVR Trim Enabled**.
Battery Reconnected	The battery in your UPS had previously been disconnected and is now reconnected.
Bypass Maintenance	The UPS has been switched to bypass using the rear-panel switch on the device.
Bypass User-Initiated	A user has initiated a bypass using either the software or the UPS front-panel control.
Bypass Ended	The UPS is no longer on bypass.
Battery Replaced	Various states relating to the battery.

Event Name	Description
Internal Temperature in Range	The internal temperature of the UPS has returned to an acceptable level. This event follows **UPS Internal Temperature Threshold Exceeded** or **UPS Internal Temperature Warning**.
Configuration File Changed	The `pcssconfig.ini` file has been edited directly.
User Logged On	A user has successfully logged into the PowerChute user interface.
User Logged Off	A user has successfully logged out of the PowerChute user interface or the PowerChute session has expired. By default, the PowerChute session times out after 15 minutes of inactivity and users will be automatically logged out of the PowerChute UI.

Command file durations and shutdowns

The **Time for other applications to shut down** on the **Outlet Sequence** screen is an important element in a shutdown (see the **OFF sequence** for more details). The value is read-only on the **Outlet Sequence** screen.

It represents the longest command file duration configured for any event that has shutdown enabled. **Time for other applications to shut down** is automatically updated when the longest command file duration is increased by using the **Event Configuration** screen.

For example, the Battery Discharged and On Battery events are both configured to shutdown. If you configure the command file associated with the Battery Discharged event to have a duration of 3 minutes, and the On Battery command file duration to 4 minutes, **Time for other applications to shut down** will be 4 minutes.



E-Mail Settings

The **E-Mail Settings** screen lists the e-mail addresses of users configured to be notified when an event occurs. In order to receive e-mail notifications when an event occurs, the e-mail address must be set up here. See **Event Configuration** for information on configuring an event to send an e-mail when it occurs.

The following five fields must be defined to enable PowerChute to send e-mail messages when events occur. (This includes messages to pagers that accept e-mail).

- **SMTP Server (Hostname, IPv4, or IPv6)** identifies the SMTP server by one of the three methods mentioned: its name, its IPv4 address, or its IPv6 address. An example hostname is mail.server.com.
- **From E-Mail Address** specifies the e-mail that the recipient gets the mail from. It is the e-mail account to be used to send notifications.
- **Port** specifies the port number from which e-mail is sent via SMTP. Port numbers can have a maximum of five digits and can be set to 25, 465, 587, or any number ranging from 5000 to 32768. If you do not enter a port number, the default of 25 is used.
- **Use SSL/TLS** defines the e-mail encryption protocol that will be used when e-mail is sent. There are three options available:
  - **None selected** – if authentication is disabled, no e-mail encryption protocol will be used and e-mail will be sent unencrypted. If authentication is enabled, e-mail will be encrypted using the SMTPS protocol.
  - **SSL** – e-mail will be encrypted using the SSL encryption protocol. You must select port 465 or the port your email administrator has assigned for SSL communications.
  - **TLS** – e-mail will be encrypted using the TLS encryption protocol. You must select port 587 or the port your email administrator has assigned for TLS communications.

The **Enable Server Identity Check** checkbox, if selected, verifies that the provided SMTP Server has a valid certificate to ensure you are connected to the correct server. This setting reduces the risk of man-in-the-middle attacks and should be selected if SSL/TLS is selected.

Click the **Test** button to send a test e-mail to all configured recipients. This button is only enabled when valid e-mail settings and e-mail recipients are provided. If you do not receive a test e-mail, check the pcss.log file for errors. Common reasons for the test e-mail not being received are incorrect credentials, server identity mismatch, proxy issues, the SMTP server is unreachable, or the chosen protocol is not supported.



If you are using SSL/TLS and your SMTP Server uses a self-signed certificate, the certificate must be added to the trusted certificate store of the bundled Java JRE.

On Windows:

1. Stop the PowerChute service via the services console – PowerChute Serial Shutdown – or using the command `net stop APCPBEAgent`
2. Copy `server.crt` (or `server.cer`) to the security directory in the installed PowerChute directory (e.g. `C:\Program Files\APC\PowerChute Serial Shutdown\jre\lib\security`).
3. Open a command prompt with Administrator privileges and navigate to this security directory.
4. Execute the following command to import the email certificate into the JRE trusted certificate store:

   ```
   ..\..\bin\keytool -import -alias mailserv -file server.crt -keystore cacerts -storepass changeit
   ```

5. Accept the certificate when prompted.
6. Start the PowerChute service via the services console – PowerChute Serial Shutdown – or using the command `net start APCPBEAgent`

On Unix/Linux:

1. Stop the PowerChute service using one of the following commands: `service pbeagent stop`, or `systemctl stop PBEAgent.service`, or `/etc/init.d/PBEAgent stop`
2. Copy `server.crt` (or `server.cer`) to the security directory in the installed PowerChute directory (e.g. opt/APC/PowerChuteSerialShutdown/jre/lib/security)
3. Open a Terminal with Administrator privileges and navigate to this security directory.
4. Execute the following command to import the email certificate into the JRE trusted certificate store:

   ```
   ../../bin/keytool -import -alias mailserv -file server.crt -keystore cacerts -storepass changeit
   ```

5. Accept the certificate when prompted.
6. Start the PowerChute service using one of the following commands: `service pbeagent start`, or `systemctl start PBEAgent.service`, or `/etc/init.d/PBEAgent start`

NOTE: In the above examples, mailserv is the alias of the mail server used within the cert file, and `server.crt` is the self-signed SSL cert of the mail server. `.cer` files are also accepted.

For more information, see **Replace Default PowerChute SSL Certificate**.

See also: **Authenticating e-mail**.

Adding and removing e-mail recipients

To add an e-mail, under the **Add/Remove E-Mail Recipients** section, type an e-mail address and click the Apply button.

To remove an e-mail, select the checkbox to the right of the address, and click Apply.

Filling in the **Contact Name** and **System Location** under **Contact Information** is optional. If present, the information is included in e-mails. The name is intended to represent the person responsible for the maintenance of the UPS. The location is the physical location of the server hosting the PowerChute Agent.

See also: **Authenticating e-mail**



We advise testing your e-mail settings after configuration. You can do this by selecting an E-Mail checkbox for an event with **Event Configuration**, and then create that event.

Authenticating e-mail

Authenticating e-mail is optional. You can enable it by selecting the **Basic E-Mail for Authentication** checkbox. Contact your e-mail administrator if you're not sure about authentication.

If you are going to use authentication, you can specify a server username and password in the respective fields, but you do not have to do so. If you don't specify a server username and password, PowerChute uses the **SMTP Server (Hostname, IPv4, or IPv6)** to obtain a list of IP Addresses that are allowed to send authenticated e-mails.

SNMP Settings

PowerChute Serial Shutdown can be configured to communicate via Simple Network Management Protocol (SNMP), and can be discovered via SNMP by a Network Management System (NMS). Using SNMP and the PowerNet MIB, you can query and configure PowerChute settings, and generate SNMP traps to automatically notify you of UPS shutdown events and lost communication events.

The PowerNet MIB is located in the etc directory in the PowerChute installation directory. The latest version is also available on the **Schneider Electric website**, choose **Firmware Upgrades - MIB** from the **Filter by Software / Firmware** drop-down box.

SNMPv1 and SNMPv3 are supported by PowerChute Serial Shutdown, and are enabled via the Agent web interface. The SNMP Agent is not discoverable via SNMP until SNMPv1 or SNMPv3 is enabled, and one user profile is configured.

SNMPv1 is less secure than SNMPv3. SNMPv1 does not provide encryption or authentication, and the Community Name is sent over the network in plain text. To use encryption and authentication with SNMP, configure SNMPv3 settings.

See below for:

- SNMPv1 Configuration
- SNMPv3 Configuration
- SNMP Trap Configuration
- SNMP Data Points

SNMP v1 Configuration

Select **Enable SNMPv1 access** to configure the User Profiles required to communicate via SNMPv1. Select **Add Profile** or edit the default profile (PCSSUser) and configure:

1. **Community Name**: The Community Name is sent with each SNMP request to obtain access to a device. The maximum length is 15 ASCII characters.
2. **NMS IP/Host Name**: The IP address, Host Name or Fully Qualified Domain Name of the Network Management System (NMS). An NMS is software that is used to manage software and hardware components on the network. It can be used to manage PowerChute via SNMP by issuing SNMP GET and SET commands. The default value of 0.0.0.0 permits access from any NMS.
3. **Access Type**:
   - **Disable**: No SNMP GET or SET requests are permitted.
   - **Read:** Only SNMP GET requests are permitted.
   - **Read/Write**: SNMP GET and SET requests are permitted.

To edit an existing SNMPv1 user profile, click the pen icon. To delete an SNMPv1 user profile, click the bin icon.

Click **Apply** to save the SNMPv1 configuration.

Certain Network Management Systems require the SNMP Engine ID to communicate via SNMP. The SNMP Engine ID is displayed under the Miscellaneous section of the SNMP Settings page.

See also: SNMP Data Points below.

SNMP v3 Configuration

Select **Enable SNMPv3 access** to configure the SNMPv3 settings. Select **Add Profile** and configure:

1. **User Name**: In SNMPv3, all GET and SET requests and SNMP Traps are matched to a user profile by the User Name. Enter a user name of a length less than or equal to 32 ASCII characters.
2. **Authentication Protocol**: Select MD5, SHA-1 or SHA-2 (SHA256 or SHA512) protocol. It is recommended to use an SHA-2 protocol, if the NMS supports it.
3. **Authentication Passphrase**: Enter an authentication password for the protocol selected, of 8-32 ASCII characters.
4. **Privacy Protocol**: Select AES-128, AES-192, AES-192 Ex†, AES-256, AES-256 Ex†, or DES. It is recommended to use the AES-256 protocol, if the NMS and PowerChute JRE support it:

   NOTE: Certain SNMP Network Management Systems use a non-standard AES key extension algorithm for 192 and 256 bit key lengths. This non-standard implementation or “Key extension algorithm” is specified by the IETF.

   If your NMS requires the use of the Key Extension algorithm, select Privacy Protocol options AES-192 Ex or AES-256 Ex.
5. **Privacy Passphrase**: Enter a privacy password for the encryption protocol selected, of 8-32 ASCII characters.
6. **Access Type**:
   - **Disable**: No SNMP GET or SET requests are permitted.
   - **Read**: Only SNMP GET requests are permitted.
   - **Read/Write**: SNMP GET and SET requests are permitted.

To edit an existing SNMPv1 user profile, click the pen icon. To delete an SNMPv1 user profile, click the bin icon.

Click **Apply** to save the SNMPv1 configuration.



Certain Network Management Systems require the SNMP Engine ID to communicate via SNMP. The SNMP Engine ID is displayed under the Miscellaneous section of the SNMP Settings page.

See also: SNMP Data Points

SNMP Trap Configuration

You can specify the device(s) that receive the SNMP traps generated by PowerChute for UPS critical and lost communication events.

To configure a Trap Receiver, select **Add Trap Receiver** and configure:

1. **Enable**: Select the checkbox to enable the Trap Receiver.
2. **NMS IP/Host Name**: The IP address, Host Name or Fully Qualified Domain Name of the NMS.
3. **Port**: The port on which the NMS will listen for incoming traps. The default port number is 162.
4. **SNMPv1**: Select this if you want to send the traps via SNMPv1.
   - **Community Name**: Enter the Community Name of the SNMPv1 user profile to be used as an identifier when SNMPv1 traps are sent to this receiver.
5. **SNMPv3**: Select this if you want to send the traps via SNMPv3.
   - **User Name**: Select the user name of the SNMPv3 user profile to be used as an identifier when SNMPv3 traps are sent to this receiver.

Click the **SNMP Trap Receiver Test** to send a test trap to the configured Trap Receiver. Check the Trap Receiver to ensure that the test trap was received.

To edit an existing SNMPv1 user profile, click the pen icon. To delete an SNMPv1 user profile, click the bin icon

UPS Critical Events

PowerChute sends SNMP traps to the configured Trap Receiver(s) upon the following events:

- **PowerChute Shutdown Event Occurs**

  When a shutdown event occurs and a Shutdown is triggered, PowerChute sends an SNMP trap to the configured Trap Receiver detailing the Event Name.

Lost Communication Events

PowerChute sends SNMP traps to the configured Trap Receiver(s) when the **Communication Lost** event occurs.

If the option to **Send Trap when condition is cleared** is enabled, a Communications Established trap is sent when the communications lost event is resolved.

Other Events

Software Update Available Trap

When the PowerChute Auto Update functionality detects that there is a new update available; a trap is sent to the configured Trap Receiver.

PowerChute Test Trap

When configuring a Trap Receiver, a test trap can be sent to determine if the Trap Receiver is receiving the traps. See **SNMP Trap Configuration**.

Configuring SNMP Trap Notification Settings

To configure the settings for UPS Critical Event or Lost Communication traps:

1. Go to **SNMP Settings > SNMP Traps**
2. Click on the icon next to **UPS Critical Events** or **Lost Communication Events**
3. Select the **Enable** checkbox to enable traps for those events.
4. **Delay**: Specify the length of time that Event must persist before a trap is sent. If the Event is cleared before this time, no trap is sent.
5. **Repeat Interval**: Specify the time interval in seconds that the trap is re-sent.
6. Select:
   - **Repeat until condition clears** if you want the trap to be sent at the repeat interval until the Event is cleared.
   - **Repeat X times** to specify the number of times the trap will be sent when the Event occurs.
7. Select **Send Trap when condition is cleared** to be notified when the Event is cleared.

   NOTE: If the PowerChute Serial Shutdown Agent is shutdown due to a UPS Critical Event, no clearing Trap will be sent to the NMS.



See also: SNMP Data Points > SNMP Traps

SNMP Data Points

The following table lists the SNMP Object Identifiers (OIDs) supported by PowerChute Serial Shutdown.

NOTE: Your UPS may not support all SNMP OIDs listed.

Refer to the PowerNet MIB available on the **Schneider Electric website** for detailed descriptions of each OID, including parameters for SET and GET operations.

UPS Information

SNMP OID Name	Access	Description
upsBasicIdentModel	read-only	The UPS Model Name (e.g. APC Smart-UPS 1000).
upsBasicIdentName	read-write	The UPS Name.
upsAdvIdentFirmwareRevision	read-only	The version number of the UPS firmware.
upsAdvIdentDateOfManufacture	read-only	The date that the UPS was manufactured, in mm/dd/yy or mm/dd/yyyy format.
upsAdvIdentSerialNumber	read-only	The internal serial number of the UPS internal microprocessor. **NOTE:** This value does not correspond to the serial number at the back of the UPS.
upsBasicBatteryStatus	read-only	The status of the UPS batteries.
upsBasicBatteryTimeOnBattery	read-only	The elapsed time since the UPS switched to battery power.
upsBasicBatteryLastReplaceDate	read-write	The date that the UPS batteries were last replaced, in mm/dd/yy or mm/dd/yyyy format.
upsAdvBatteryCapacity	read-only	The remaining battery capacity, expressed as a percentage of full capacity.
upsAdvBatteryTemperature	read-only	The current internal UPS temperature, in Celsius.
upsAdvBatteryRunTimeRemainin g	read-only	The time remaining before the UPS batteries will be depleted.
upsAdvBatteryReplaceIndicator	read-only	This value indicates if the UPS batteries need to be replaced.
upsAdvBatteryNumOfBattPacks	read-only	The number of external battery packs connected to the UPS.
upsAdvBatteryActualVoltage	read-only	The battery voltage, in Volts.
upsBasicInputPhase	read-only	The current AC input phase.
upsAdvInputLineVoltage	read-only	The current voltage of the input power to the UPS, in VAC.
upsAdvInputFrequency	read-only	The current input frequency to the UPS, in Hertz.
upsAdvInputLineFailCause	read-only	The most recent reason why the UPS transferred to battery power.
upsBasicOutputStatus	read-only	The current state of the UPS (e.g. On Line, On Battery, etc.).
upsBasicOutputPhase	read-only	The current output phase.
upsAdvOutputVoltage	read-only	The output voltage of the UPS, in VAC.
upsAdvOutputFrequency	read-only	The current output frequency of the UPS, in Hertz.
upsAdvOutputLoad	read-only	The current UPS load expressed as a percentage of the UPS rated capacity.
upsAdvOutputCurrent	read-only	The current (in amperes) drawn by the load connected to the UPS.

upsAdvConfigRatedOutputVoltag e	read-write	The nominal output voltage from the UPS, in VAC.
upsAdvConfigHighTransferVolt	read-write	The maximum line voltage in VAC permitted before the UPS transfers to battery power. See **High Transfer Voltage**.
upsAdvConfigLowTransferVolt	read-write	The minimum line voltage in VAC permitted before the UPS transfers to battery power. See **Low Transfer Voltage**.
upsAdvConfigAlarm	read-write	An indication of how the UPS should handle audible line fail alarms.
upsAdvConfigSensitivity	read-write	The sensitivity of the UPS to input power noise.
upsAdvConfigLowBatteryRunTim e	read-write	The desired runtime of the UPS, once the low battery condition is reached, in seconds.
upsAdvConfigShutoffDelay	read-write	The number of seconds the UPS remains on, once it has been commanded to turn off.
upsAdvConfigAllowedSetTable	read-only	Read this OID to get the UPS data points for which you set values, using an SNMP SET. Querying this table returns the following OIDs: • upsAdvConfigRatedOutputVoltage • upsAdvConfigHighTransferVolt • upsAdvLowTransferVolt • upsAdvConfigLowBatteryRunTime • upsAdvConfigHighBypassTransferVolt • upsAdvConfigLowBypassTransferVolt The query also returns the acceptable range of values you can set for each OID. If your UPS does not support an OID, the query will return `null`.
upsAdvConfigAllowedSetTable	read-write	When operating in bypass, this is the highest voltage the UPS will supply to the connected load. It is the allowable input voltage that will be passed through “bypass”. See **Upper Bypass Limit**
upsAdvConfigLowBypassTransfe rVolt	read-write	When operating in bypass, this is the lowest voltage the UPS will supply to the connected load. It is the allowable input voltage that will be passed through “bypass”. See **Lower Bypass Limit**
upsAdvControlFlashAndBeep	read-write	Write to this OID to control the UPS audible alarms and UPS display indicator lights.
upsAdvControlBypassSwitch	read-write	Write to this OID to control the UPS bypass mode.
upsAdvTestDiagnosticSchedule	read-write	Write to this OID to control the battery test schedule of the UPS.
upsAdvTestDiagnostics	read-write	Write to this OID to command the UPS to perform a diagnostic self test.
upsAdvTestDiagnosticsResults	read-only	The results of the last diagnostic UPS Self Test.

upsAdvTestLastDiagnosticsDate	read-only	The date of the last UPS diagnostic test in mm/dd/yy format.
upsAdvTestRuntimeCalibration	read-write	Writing to this OID provides options to perform a Runtime Calibration Test.
upsAdvTestCalibrationResults	read-only	The results of the last Runtime Calibration test.
upsAdvTestCalibrationDate	read-only	The date the last Runtime Calibration test was performed, in mm/dd/yy format.
upsCommStatus	read-only	The status of the SNMP Agent's communication with the UPS.
powerNetSoftwareSystemDescription	read-only	A description of the PowerChute Serial Shutdown Agent.
upsOutletGroupStatusTableSize	read-only	The number of outlet groups in the UPS.
upsOutletGroupStatusTable	read-only	This table allows you to get the status of the outlet groups in a UPS, as defined in the PowerNet MIB. The number of entries in this table depends on **upsOutletGroupStatusTableSize**
upsOutletGroupConfigTableSize	read-only	The number of outlet groups in the UPS.
upsOutletGroupConfigTable	read-write	A list of outlet groups that can be configured with a range of parameters as defined in the PowerNet MIB: • Name • PowerOnDelay • PowerOffDelay • RebootDuration • MinReturnRuntime • LoadShedControlSkipOffDelay • LoadShedControlAutoRestart • LoadShedControlTimeOnBattery • LoadShedControlRuntimeRemaining • LoadShedControlInOverload • LoadShedTimeOnBattery • upsOutletGroupConfigLoadShedRuntimeRemaining

PowerChute Serial Shutdown Identity Information

SNMP OID Name	Access	Description
pcbehostname	read-only	The hostname of the PowerChute Serial Shutdown Agent.
pcbeVersion	read-only	The PowerChute Serial Shutdown version number, in the format x.x.x.x.
pcbeOS	read-only	The operating system and version on which the PowerChute Serial Shutdown is installed.
pcbeJavaVersion	read-only	The version of Java installed with PowerChute Serial Shutdown.

pcbeUIProtocol	read-only	The protocol used to connect to the PowerChute Agent web interface (http/ https).
pcbeHttpsPort	read-only	The port used for the PowerChute https web interface.

PowerChute Serial Shutdown Alarm Information

SNMP OID Name	Access	Description
pcbeCriticalFlag	read-only	This OID indicates that PowerChute Serial Shutdown has begun a graceful shutdown of the host.
pcbeCriticalCause	read-only	This OID provides the reason that PowerChute Serial Shutdown has begun a graceful shutdown of the host.
pcbeComsLostFlag	read-only	This OID indicates that PowerChute cannot communicate with the UPS.
pcbeUpdateAvailableFlag	read-only	This OID indicates that a new version of PowerChute is available.
pcbeUpdateDesc	read-only	This OID provides the description of the new version of PowerChute that is available.

SNMP Traps

The tables below details the OID names of the SNMP traps sent by PowerChute for critical and lost communication events.

UPS Critical Events

SNMP OID Name	Level	Description
pcbeCriticalEventActive	Severe	PowerChute Serial Shutdown has begun a graceful shutdown of the host due to a critical event.
pcbeCriticalEventResolved	Informational	The PowerChute critical event has been resolved, and a graceful shutdown of the host continues.

Lost Communication Events

SNMP OID Name	Level	Description
pcbeComsLost	Severe	PowerChute cannot communicate with the UPS.
pcbeComsLostResolved	Informational	PowerChute has re-established communications with the UPS.

Other Events

SNMP OID Name	Level	Description
pcbeTest	Informational	PowerChute has sent a test trap to the NMS.
pcbeUpdateAvailable	Informational	PowerChute has detected that an update is available.

Shutdown

In PowerChute Serial Shutdown, shutdowns can be initiated:

- Through an event occurring, see **Event Configuration**.
- By using a schedule, see **Scheduled Shutdown**.
- By manually shutting down your system, see **Shutdown Now**.
- By manually shutting down an outlet, see **Outlet Control**.

Shutdowns can also be initiated manually through the UPS LCD, or via UPS **Load Shedding**, or from "outside" PowerChute, e.g. from the Network Management Card (NMC). However, using the NMC in conjunction with PowerChute Serial Shutdown is not supported.

Initial Setup

This option guides you through a series of screens that enable you to complete your shutdown configuration.

You can select this menu option at any time but this screen displays automatically until you have confirmed which outlet group is supplying power to the server hosting the PowerChute Agent (which displays on the **Outlet Setup** screen).

The configuration screens are listed below in their display order. You can also access these screens individually at any time.

- **Preferences**
- **Outlet Setup**
- **Shutdown Settings**
- **Outlet Sequence**
- **Scheduled Shutdown**



You can exit the shutdown configuration on any of the screens. When you click the Next or Advanced Setup button, your changes are saved and are retained even if you cancel out of the Initial Setup sequence before the end.

The Initial Setup screen is the default user interface until:

1. You accept the default outlet group presented by selecting the checkbox **Confirm <Outlet Group name> is powering the server with the PowerChute Agent** and clicking Apply

OR

2. You select a different outlet group in the drop-down box and click Apply.

Shutdown Settings

This screen summarizes your shutdown configuration and also enables you to configure some steps of the shutdown sequence. (This screen is also part of the shutdown configuration accessible through **Initial Setup**).

The summary includes timing and delays, with the "base time" being the occurrence of the On Battery event. Note also that when load shedding is enabled, a warning is displayed at the bottom of this screen (see **Load Shedding**).

The options chosen on this screen can affect the configuration of events, set up in **Event Configuration**. This can include which events are selected to cause a shutdown. Read the other sections below for further information.

See also:

- **Power Outage Configuration**
- **Power Outage Configuration and Shutdown on Event Configuration**
- **Interactivity in shutdown durations**

Power Outage Configuration

The **Power Outage Configuration** options define the response when a power problem causes the UPS to switch to battery operation.

- **Immediately** initiates a shutdown as soon as a **On Battery** event indicates that the UPS switched to battery power.
- **After UPS has been on battery for** initiates a shutdown when the UPS has been operating on battery power for the period of time configured here.
- **At runtime limit** configures the **Low Battery** event to shut down; this is viewable on the **Event Configuration** screen.
  The Low Battery event is generated when the UPS is on battery and the battery runtime falls below the number of seconds you set here.
  The Battery Discharged event is generated when the UPS is on line and the battery runtime falls below the number of seconds you set here.
- **Do not shut down during a power outage** relies on the **Low Runtime Warning** event to cause a shutdown.
  The Low Runtime Warning event is generated when battery runtime falls below the combined time configured for Application and Operating System shutdown: see the **Operating System and Application Shutdown** section of this screen.

NOTE: This Low Runtime Warning event does not display on the **Event Configuration** screen as it is not configurable (because it *always* causes a shutdown).

When you select different radio button options here, the displayed summary information on this screen (under the **Shutdown Summary** heading) changes.

When any of the **Outlet group turns off when** checkboxes on **Load Shedding** are selected, this can impact how this screen works. A warning displays on this screen to inform you of this.

Power Outage Configuration and Shutdown on Event Configuration

Choosing one of the four **Power Outage Configuration** options on Shutdown Settings (discussed above) works interactively with the Event Configuration **Shutdown** checkboxes for different events.

You can see this by selecting a radio button option here, pressing Apply, and going to the **Event Configuration** screen to note the differences.

This is also true in reverse: changing a **Shutdown** checkbox for an event in Event Configuration can change which radio button option is selected here on Shutdown Settings.

If the check box is selected, a warning appears on the screen to inform you of this.

This table summarizes the interaction:

With this On Battery option selected:	...the Shutdown checkbox of these events is selected		
	Low Battery	On Battery	Time on Battery Threshold Exceeded
Immediately	No	**Yes**	No
After UPS has been on battery for	No	No	**Yes**
At runtime limit	**Yes**	No	No
Do not shut down in the event of a power outage	No	No	No

* The **Low Runtime Remaining** event is always configured to shutdown for these **Power Outage Configuration** options. This event is only displayed in the **Event Log**, and is not configurable on the **Event Configuration** page.

For example, if you choose **Immediately** here and apply it, you will see in the **On Battery** row of **Event Configuration** that the **Shutdown** checkbox has been selected automatically.

And if you then clear the **Shutdown** checkbox for the **On Battery** event of Event Configuration, apply it, and return here to **Shutdown Settings**, the **Immediate** option will NOT be the selected option.

Interactivity in shutdown durations

The value for **Time for operating system to shut down** on this **Shutdown Settings** screen displays as a read-only field on the **Outlet Sequence** screen, see **OFF sequence**. By default, upon installation this value is set to 180 seconds.

Another field on this **Shutdown Settings** screen, **Time required for command file to run** under Operating System and Application Shutdown, interacts with the **Command File Execution Duration** field for the **Shutdown Starting** event on **Event Configuration**. When they are changed, these fields automatically update each other.



Shutdown Starting command file duration (Event Configuration)

Time required for command file to run

(Note that the **Time required for command file to run** field only displays on **Shutdown Settings** when you have chosen a command file).

Hyper-V Server operating system shuts itself down only after shutting down its virtual machines. Allow for this in the **Time for operating system to shut down** value. Perform a test shutdown to gauge the time needed.

Scheduled Shutdown

Use this option to view and create scheduled shutdowns. (This screen is also part of the shutdown configuration accessible through **Initial Setup**).



See **Outlet Sequence** for information on setting up delays and sequencing in shutdowns.

Viewing and creating scheduled shutdowns

The calendar view is by **month**. Move from month to month by clicking on the arrow buttons on the top left. Click on the **today** button beside the arrow buttons to make today the highlighted date.

You can schedule a shutdown to:

- **Occur once**: runs once only
- **Repeat Daily**: runs every day at the same time.
- **Repeat Weekly**: runs on the same day of the week, every week.

A schedule that displays in red or with a red outline indicates one of the following:

1. The scheduled shutdown is due to run within ten minutes. At this point, you cannot edit a schedule though you can cancel it. The schedule is labeled as **Pending**.
2. The schedule can't be run: something has happened since you created the scheduled shutdown. For example, you might have changed the outlet providing power to the PowerChute Agent (see **Outlet Setup**).
   - You should edit or delete this schedule, see "Creating and Editing Schedules".

See also:

- **Moving and resizing schedules**
- **Overlapping scheduled shutdowns**
- **Daylight savings and scheduled shutdowns**

Creating and editing schedules



Ensure that your local time settings (timezone, date, and time) are correct. We recommend that you don't create schedules from a web user interface in a different time zone.

To create a schedule:

- Click on a date in the main calendar view, and the **Scheduled Shutdown** dialog displays.

NOTE: You can only create shutdown schedules for a future time and date.

- Fill in the fields:
  - **Schedule Name:** Provide a meaningful name for the schedule. Schedule name must be unique.
  - **Shutdown sequence starts at:** Enter the date and time at which you want the shutdown sequence to begin.

    Notes:
    - You can define the shutdown sequence by configuring the **Shutdown Settings**.
    - Once you enter a date and time to start the shutdown sequence, you must consider the values of **Time required for command file to run** and the **Time for Operating System to shutdown,** defined in the **Shutdown Settings**, when configuring the Turn-on sequence time. The UPS cannot turn on before it has completed a shutdown.
    - **T urn-on sequence starts at:** Enter the date and time at which you want the turn on sequence to begin.

NOTE: You can define the turn on delay settings on the **Outlet Sequence** page.

- If you select a Main Outlet Group to shut down, its Switched Outlet Groups are automatically selected also. A Main Outlet Group always turns off its Switched Outlet Groups before it turns off; see **Outlet Sequence**.

- Click OK and the schedule displays back on the calendar view.
- You can enter as many schedules as you like during a session and they all display in the calendar.

NOTE: Browser performance may suffer if you enter more than 1000 schedules.However, they are not saved until you press the Apply button.

To **change** or **delete** a schedule:

1. Click on the scheduled shutdown in the main calendar view and the **Scheduled Shutdown** dialog displays with the current details.
2. Change any field value as necessary and choose OK.
3. Choose the Delete button to erase it from the calendar view.

A schedule is removed from the calendar after it runs.



A scheduled shutdown starts with the shutdown being initiated, and ends with the turn-on command. Though the **schedule duration** does not appear to include the turn-on delays, they are added to the schedule when it is executed. See **Outlet Sequence**.

Moving and resizing schedules

You can **move** a schedule in the calendar view by clicking and dragging. However, you can't copy a schedule.

You can **expand** a schedule into a future date, but not into a past date. Expanding can save you time because you don't need to open the Scheduled Shutdown dialog.

To expand in the calendar view, hover the mouse pointer over the right edge of the schedule until you see the double-headed arrow, and click and drag.

Overlapping scheduled shutdowns

Two overlapping scheduled shutdowns have some or all of their timing in common.

PowerChute Serial Shutdown uses criteria to ensure that the overlapping schedules you enter make sense, as well as actually being possible to run.

To achieve this, PowerChute prevents the creation of some overlapping schedules and enforces priorities and rules, as outlined in "Guidelines for running overlapping schedules".

Guidelines for running overlapping schedules

If schedules overlap when they have one outlet group in common, **then only one schedule is actually run**.

How does PowerChute decide which one is run? By using this logic:

A **once-off** schedule has priority over:

1. a **weekly** schedule which has priority over
2. a **daily** schedule

The starting and ending times of the schedules are irrelevant in this.

For example, see the graphic, showing two overlapping schedules which both shut down the outlet called "Main Server". Even though it begins later, the "Once off with Main Server" schedule has priority over the "Weekly for Main Server" schedule, and it is the only schedule which will run.



Prioritizing **once-off schedules** enables you to schedule a unique shutdown like a public holiday.

Prioritizing **weekly over daily schedules** enables you to shut down at the weekend, while maintaining daily scheduled shutdowns.

IMPORTANT : As indicated, a schedule could be designated to start *before* an overlapping one and still not run.

Daylight savings and scheduled shutdowns

Don't schedule a shutdown to start or finish during a Spring daylight savings "transition hour".

The transition hour means the skipped hour when daylight savings commences in Spring.

Outlet Sequence

The Outlet Sequence screen enables you to configure your outlet groups to turn off and on in a specific sequence during a shutdown. (This screen is also part of the shutdown configuration accessible through **Initial Setup**).

Additionally, you can choose whether outlet groups should automatically turn back on after a shutdown. (By default, they turn on).

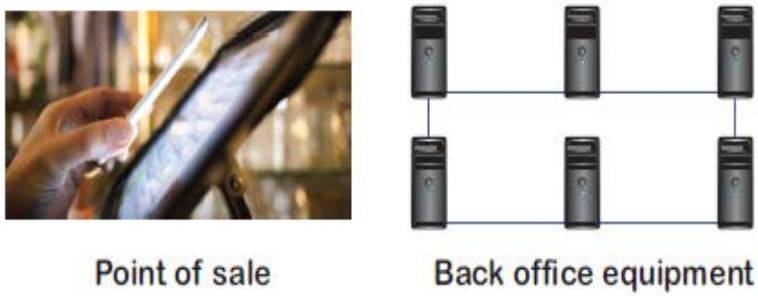
The delays on this screen apply to all shutdowns whether initiated by a power event, a scheduled shutdown, or manually by a user.

IMPORTANT : The **Load Shedding** settings impact these on the Outlet Sequence screen page.

Examples of how you might use this screen

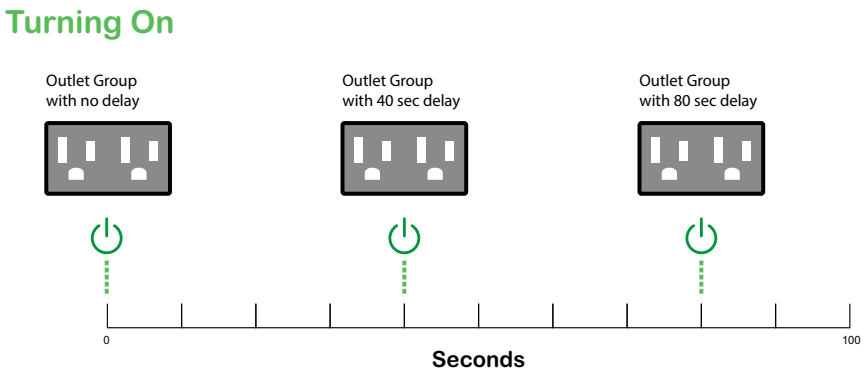
You configure the **OFF sequence** of your outlet groups by specifying the turn-off delays of individual outlet groups.

An example of this usage is in electronic "Point of sale" transactions, where it is essential to ensure that all the front office equipment has been shut down gracefully before the back office equipment shuts down also. This maintains the accuracy of the sales transaction data.



Similarly, On Sequencing is achieved by delaying the turning on of individual outlet groups. This applies when your system is starting up initially or on the return of AC utility power after an outage.

You might use on sequencing to avoid a temporary overload if all the devices connected to your UPS try to turn on at the same time. Another use might be to ensure that certain equipment, such as network switch devices, turns on before other equipment, such as servers, which need the network switch in order to communicate.

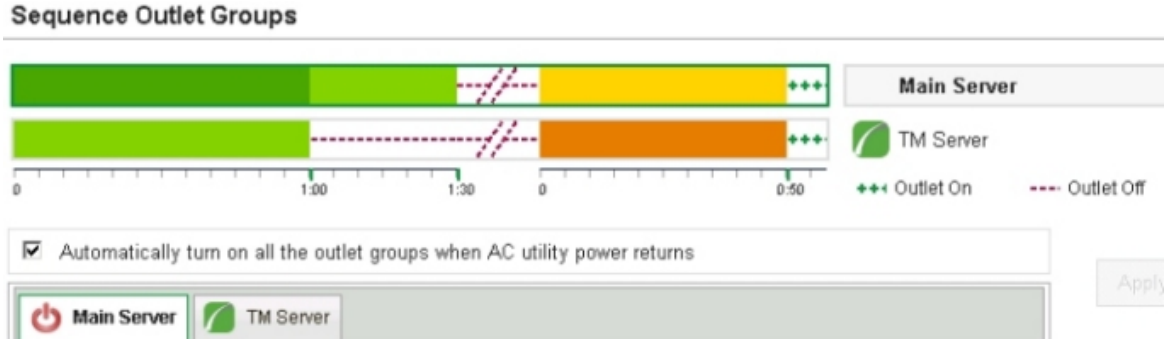


Understanding the usage of outlet groups can be facilitated by thinking of them as separate UPS devices in their functionality, or “virtual UPS devices”.

Using the graph and common fields

The graph at the top of this Outlet Sequence screen shows a timeline of delays, turn offs, and turn ons, for each outlet group included in a shutdown.

Each outlet group has its own row in the graph, with the outlet group name on the same row, to the right. The outlet group supplying power to the PowerChute Agent is designated by the PowerChute logo.



Time, in minutes and seconds, is measured along the bottom of the graph. The selected outlet group has a green border in the graph.

Move your pointer over each section in the graph to display text with information on time values for that outlet group.

View and edit the turn off and turn on values in individual fields lower down on the screen.

To move between outlets, you can either click on a different row in the graph, or select a different tab.

The Automatically turn on all outlet groups when AC utility power returns checkbox underneath the graph applies to all outlet groups displayed on this screen. If you want to turn on outlets manually after your system has turned off, clear this checkbox.

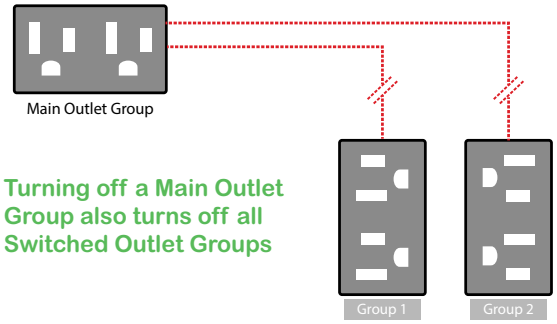
Choosing which individual outlet groups to turn off in a shutdown

At the top of each area under the tabs, a message states whether the selected outlet group turns off during a shutdown. The outlet group supplying power to the PowerChute Agent *always* turns off during a shutdown, so **This outlet group is included in a turn-off sequence** always displays under that tab.

What displays here for other outlet groups depends on which type of outlet group — Main or Switched — supplies power to *the server that the PowerChute Agent is protecting.* The different set-ups are discussed below.

NOTE: On Smart-UPS devices, any outlet group labeled Group 1, Group 2, is a Switched Outlet Group. Any unlabelled outlet group is a Main Outlet Group. (Some devices have no Main Outlet Group).

- If your UPS has a **Main Outlet Group** and it supplies power to the PowerChute Agent, then all outlet groups will automatically turn off. When turning off, a Main Outlet Group always turns off all the Switched Outlet Groups.



- If you use a **Switched Outlet Group** to supply power to the server running the PowerChute Agent, then that server automatically turns off in a shutdown; the Main Outlet Group has a checkbox **Turn this outlet group off** enabling you to choose whether or not to turn the group off.
  - If you choose to turn this Main Outlet Group off, then all other Switched Outlet Groups turn off in a shutdown.
  - If you choose not to turn off the Main Outlet Group in a shutdown, then you have the choice whether to turn off other Switched Outlet Groups.
- If you have **only Switched Outlet Groups**, then the group supplying power to the PowerChute Agent always shuts down and ALL other groups have a choice of whether to be shut down or not.

When the **Turn this outlet group off** checkbox displays, and you clear the box, then the outlet group disappears from the timeline graphic.

Deciding on delay times for individual outlet groups

You can set delay times for both turning OFF an outlet group and turning it back ON with the **Time for outlet group to turn off** and **Time before outlet group turns on** fields respectively.

Referencing the timeline graph for individual outlet groups in comparison with any other outlet groups can be very helpful in understanding how they work in tandem.

Simply placing the mouse pointer over the different graph rows displays values and delay labels. The graph also shows the order, from left to right, of delay times coming into play.

OFF sequence

Any Main Outlet Group can only turn off AFTER all the Switched Outlet Groups are off. The outlet group supplying power to the PowerChute Agent has these possible turn-off delay times:

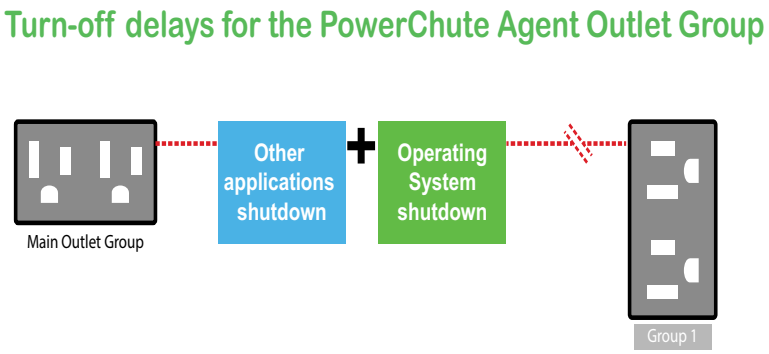
- **Time for other applications to shut down**: this value represents a duration for applications like Siebel and Microsoft SQL to shut down gracefully and for any command file to run.

  This is a read-only value here. In many circumstances, it derives from **Time required for command file to run** on **Shutdown Settings**. However, if you configure ANY individual shutdown event to use a greater command file running time, then that is displayed here instead. (You configure this on **Event Configuration**). See also the **Interactivity in shutdown durations**.

- **Total time for <outlet group name> to turn off**: This displays when the PowerChute Agent outlet group is also the Main Outlet Group. The field shows the greatest length of time configured for the other outlets

groups to turn off, in the **Turn outlet group off after** field. (Any Main Outlet Group has to wait for the Switched Outlet Groups to turn off first).

- **Time for operating system to shut down**: this value is configured on the **Shutdown Settings** screen.



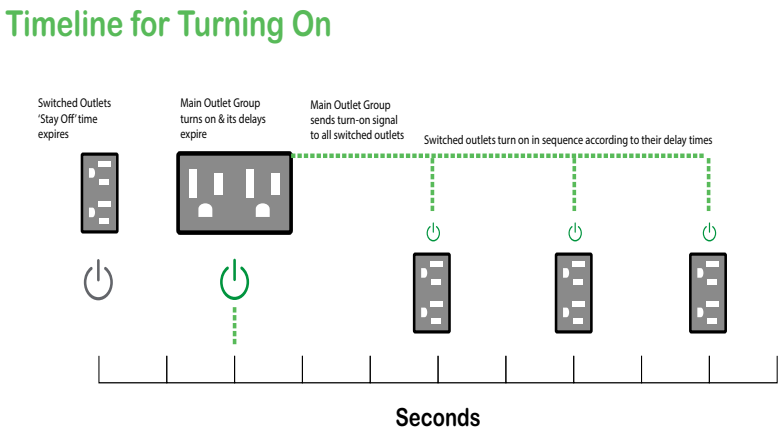
As indicated in the bullets above, any outlet group other than the group supplying power to the PowerChute Agent has this field: **Turn outlet group off after**.

ON sequence

When turning on, the Main Outlet Group turns on first, and its delays must have expired before the Switched Outlet Groups turn on.

The “stay off” times and “turn on” delays are separate concepts, and have separate values.

All configured Switched Outlet Groups receive the command to start the turn-on process at the same time: their different delays can vary their actual turn on.



The following fields are present for all outlet groups, Main or Switched:

- **Outlet group stays off for a minimum of**: Regardless of any other outlet group, the individual group always stays off for at least the amount of time specified here.

NOTE: A Main Outlet Group cannot start its turn on until the Switched Outlet Groups have finished their stay-off delay times

- **Minimum battery runtime required before outlet group turns on**: Entering a value in this field ensures that the outlet group does not turn on unless the UPS can support the load on this outlet group for this amount of time.
- **Use this additional delay to sequence outlet group turn-on**: Entering different delay values in this field causes the sequencing of turn ons. See the different possibilities below. Place the mouse pointer over the different graph rows for further information on the delay values shown.
  - If you have a UPS with Switched Outlet Groups only:
    Their individual **Use this additional delay...** delay times start to count down simultaneously.
  - If you have a UPS with both Main and Switched Outlet Groups:
    On the Main Outlet Group, the turn on begins after the minimum stay-off times for all outlet groups have expired and its own **Use this additional delay...** time has elapsed, in that order.
    On the Switched Outlet Groups, after the Main Outlet Group is turned on, their individual **Use this additional delay...** delay times begin to count down.
- **Waiting for other outlet groups** is a non-editable value that shows how long a group must wait for other outlet groups before starting its own **Use this additional delay...** delay time. It does not always have a value. (Move your pointer over the graph rows to understand this concept in practice). It can be derived from several factors:
  - waiting for a Main Outlet Group to turn on
  - the turn-off delays of other outlet groups
  - the stay-off delays of other outlet groups

Load Shedding

Load shedding enables you to specify conditions to turn off power to individual Switched Outlet Groups.



See **Shutdown Now** for information on manually turning off outlet groups with immediate effect.

An example of using this load shedding option would be for turning off non-critical loads like monitors when the UPS is running on battery or is overloaded. This would preserve the battery charge and the runtime for essential loads.

Another example would be to disable an automatic restart after an overload in order to investigate the cause of the overload before turning the outlet group back on.



Load shedding is available for UPS devices with Switched Outlet Groups but NOT for a Main Outlet Group. If your UPS has no Switched Outlet Groups, then the menu item does not display.



IMPORTANT : The Load Shedding settings impact those on the **Outlet Sequence** page! You should clear the top three checkboxes if you don't want to use load shedding.

If you have more than one Switched Outlet Group, click on the relevant tab.

When any checkbox is selected under the **Outlet group turns off when** heading, and the individual condition is met, then that outlet turns off. It is NOT necessary for all three conditions to be met to have the outlet group turn off.

The UPS determines when an overload event occurs, see **Overload**.

If you have selected the **UPS Overload condition exists** checkbox and an overload occurs which turns off the outlet group, it might not be possible to turn the outlet group back on without first clearing the checkbox.

As displayed under **Associated actions**, you can enable two actions to occur when load shedding turns off an outlet group.

- The **Use Turn Off Delay** value is derived from **Outlet Sequence**.



The turn-off delay is NOT observed with an overload *even if you select* Use Turn Off Delay.

It is observed with the other two labels: Time on battery exceeds and Remaining runtime while on battery falls below.

- You can configure an outlet group to restart by selecting **Turn on outlet group automatically when AC utility power returns**.

Outlet Control

The Control Outlet Groups screen shows you the name and present status of each outlet group on your UPS. In addition you can specify actions to occur immediately by choosing from lists in the drop-down boxes.

.No actions are available for the Main Outlet Group unless all Switched Outlet Groups are turned off, and their status here is displayed as Off.

The possible types of **status** for each outlet group are:

- On
- On, turning off
- On, processing shutdown
- On, processing reboot
- On, processing sleep
- On, processing shutdown for load shedding
- Off
- Off, turning on
- Off, processing shutdown
- Off, processing reboot
- Off, processing sleep

To choose an **action** for an outlet group, select it from the drop-down box and click Apply. These actions include rebooting which is useful for bringing unresponsive equipment back into operation. The Off action can be used to prevent other people from adding unauthorized equipment to a UPS.

The available actions are below, (see also **Outlet Sequence**):

- **Off with Delay** - turn off the outlet group power while enforcing the configured delays.
- **Off Immediately** - turn off the outlet group power without any delays.
- **Shut down with Delay, AC restart** - turn off the outlet group while enforcing the configured delays; if AC utility power subsequently returns, the outlet group will restart, with configured delays.
- **Shut down Immediately, AC restart** - turn off the outlet group without any delays; if AC utility power subsequently returns, the outlet group will restart, with configured delays.
- **Reboot with Delay** - turn off and restart the outlet group while enforcing all the configured turn-off and turn-on delays.
- **Reboot Immediately** - turn off immediately; restart the outlet group with the configured delays.

This user interface always displays a confirmation screen before carrying out any of these actions. Use the Confirm button on that screen to continue with the action or Cancel to stop. The confirmation screen also specifies any configured delays in seconds.

IMPORTANT: Setting the UPS LCD to read-only and turning off the outlet group with the PowerChute Agent will necessitate a UPS reboot to turn the outlet group back on. See **UPS LCD is Read-Only** and the table footnote.

Shutdown Now

Use the Shutdown Now screen to initiate a shutdown sequence, either immediately or within fifteen minutes. You can also control how and when the UPS turns on after the shutdown.

The screen can be used as a quick alternative to scheduling a once-off shutdown.In addition, it gives you the option of manually turning on power to the UPS after a shutdown.

UPS Shutdown Type	With both of these options in this drop-down box — **Delayed Wakeup** and **Manual Restart** — the **turn-off delays** you have set up on **Outlet Sequence** are observed. However, the **turn-on delays** are observed with Delayed Wakeup but they are NOT observed with Manual Restart.
Wakeup Delay	This field displays only when you choose **Delayed Wakeup**. Use it to specify the amount of time the UPS will remain turned off. The **Time for operating system to shut down** and **Time for other applications to shut down** are subtracted from this **Wakeup Delay,** to ensure that all switched outlet groups commence turn on at the same time. Example: For a UPS with two switched outlet groups (1 & 2): • Outlet Group 1: **Time for operating system to shut down** and **Time for other applications to shut down** are set to 2 minutes each. • Outlet Group 2: **Time for operating system to shut down** and **Time for other applications to shut down** are set to 1 minute each. • If you set the Wakeup Delay for the UPS to 6 minutes: - Outlet Group 1 is asleep for **2 minutes** (6 minutes minus 2+2 minutes) - Outlet Group 2 is asleep for **4 minutes** (6 minutes minus 1+1 minutes) - Both Switched Outlet Groups commence Turn On delay at the same time.



Use the **Cancel Pending Shutdown** button on this screen if you change your mind about shutting down. It displays on this screen before the shutdown commences.

Logging

Event Log

A PowerChute event can be critical, warning, or informational. An example of a critical event is a low battery, and a warning event could be when power to the UPS has been interrupted. Informational events are everyday occurrences such as the monitoring of your system has started, or a self test has passed.

The **View Event Log** screen lists and classifies the recent UPS events and the date and time each event occurred. The list starts with the most recent events. See **Event Configuration** for descriptions of events.

To export the log to a text file, `EventLog.txt`, click the **Export** button. View this file in `C:\Program Files\APC\PowerChute Serial Shutdown\agent` (or wherever it is installed).

To delete the contents of the event log, click the **Clear Log** button at the bottom of the screen.

Click **Refresh** to view events that might have occurred after you first displayed this screen.

Energy Usage Log

PowerChute stores the connected UPS device's energy usage in a log file, located in the `C:\Program Files\APC\PowerChute Serial Shutdown\agent\energylog` directory (or wherever it is installed).

The energy usage logs have the following structure:

`2010timestamp;realLoad(watts);relativeLoad(percentage);calculatedLoad(watts)`

For example: `368633153;200.0;200.0;200.0`

Reading the Log File

Timestamp: To interpret the timestamp:

1. Calculate the difference between the UNIX timestamp starting point (01/01/1970) and the `2010timestamp` value from the log (01/01/2010), which is 1262304000.
2. Add the timestamp value from the log file (for example `368633153`) to 1262304000, which equals 1,630,937,153.
3. Using a third-party tool such as **Epoch Converter**, enter the value calculated in step 2 into the text box and click **Timestamp to Human date**. The output will reveal the timestamp:

   Converting 1630937153:

   Assuming that this timestamp is in seconds:

   GMT: Monday, September 6, 2021 2:05:53 PM

   Your time zone: Monday, September 6, 2021 3:05:53 PM GMT+01:00 DST

   Relative: 2 days ago

Load Entries: Each entry in the log file captures the UPS device's energy usage in Watts over a 5-minute period. If the `realLoad` column has a value other than null, it will be used. If the `realLoad` value is null, the `calculatedLoad` is used instead. If both values are null, the line is skipped. For example: `368633153;200.0;200.0;200.0` equals 200.0 Watts.

Calculating Energy Usage

To convert the load value in Watts used in 5 minutes into kilowatt hours (kWh), divide the load value by 12,000. For example: 200.0 Watts used in 5 minutes equals 0.01666667 kWh. This 12,000 value is calculated using the following formula:

1. Multiply the load value by 300,000 to convert the interval from 5 minutes into milliseconds (5 x 60 x 1000).
2. Divide the value by 3,600,000,000 to convert the interval into seconds, then hours, and then from Watts to Kilowatts (3600 x 1000 x 1000).

Data Log

The View Data Log screen logs are sorted by date, then time, with the most recent data appearing at the top of each screen. This table gives a brief description of the fields:

Field	Description
Input Line Voltage (VAC)	The AC voltage being provided to the UPS at the time that the entry is made in the data log.
UPS Output Voltage (VAC)	The voltage, in volts AC, supplied by the UPS to its supported equipment.
Battery Voltage (VDC)	The voltage, in volts DC, on the UPS device's battery.
Battery Charge (%)	The percentage charge of the UPS battery capacity.
Input Frequency (Hz)	The frequency, in Hertz, of the input voltage to the UPS.
Output Frequency (Hz)	The frequency, in Hertz, of the output voltage.
UPS Load (%)	The percentage of the possible UPS load that your equipment used during the recording interval.
Internal UPS Temp (°C)	The UPS temperature in degrees Celsius or Fahrenheit. **NOTE:** If the UPS has no internal temperature sensor, this column does not display.

Use the **Show / Hide Columns** button to hide any of the displayed columns, other than date and time which cannot be hidden.

Click the button to display the column checkboxes and clear any checkbox to hide that column. This feature affects the display only; all data is still recorded.

By clicking and dragging on a column heading, e.g. Output Frequency (Hz), you can move and re-arrange columns. To return to the original, default arrangement, click on the **Reset Columns** button.

To delete all records in the data log, click **Clear Log** at the bottom of the screen.

Click **Refresh** to view new data since you first displayed this screen.

Log Settings

Log Settings enables you to configure the recording parameters of both the Event and Data Logs. This includes disabling logging. If event logging is disabled, the options relating to logging in **Event Configuration** are also disabled.

The Event Log records individual event occurrences. The Data Log, by contrast, provides you with a snapshot of your system by recording values at regular time intervals.

Use **Event Log Entry Expiration** and **Data Log Entry Expiration** to choose a time interval for deleting log entries. For example, if you choose a month, then entries are deleted when they are a month old.

Log files taking up disk space

The log files can take a lot of disk space on your server. Be aware of this when you configure the options on this screen:

- With the **Expiration** fields (Event Log Entry Expiration and Data Log Entry Expiration), choosing *a long time interval* could mean that your log eventually takes up a lot of disk space.
- The **Data Recording Interval** field specifies how often the data is recorded to the Data Log. The *smaller the interval*, the more times the data is recorded and the larger the log file.
- If you choose **Do Not Delete Entries**, the files might get very large after a period of time.

Energy Management

Energy Management enables you to monitor the energy consumption of equipment attached to your UPS. This includes carbon dioxide consumption and your energy costs.

Energy Management accesses data on Schneider Electric servers by using the Internet.

Energy Reporting

The energy report gives you information on **Energy** consumed in kilowatts per hour and the **Cost** incurred in your local currency.

On installation, PowerChute references your operating system and determines your system locale. From the locale, PowerChute determines average prices and emissions for your country. (See **Energy Settings**).

CO2: The carbon dioxide that was emitted in generating this energy. This is measured over the chosen time period in kilograms or pounds.

Carbon dioxide is a greenhouse gas — it traps heat radiation that would otherwise escape from Earth — and is a primary cause of climate change.

Energy report time span

The energy report period is by default from the PowerChute Serial Shutdown installation date today.

You cannot enter a date prior to the PowerChute installation date in the **From** field. You cannot enter a date after today's date in the **To** field.

If you change the From date, this new date becomes the default, whereas the To date is always today's date.

(If you have performed a PowerChute upgrade, the **From** date is still the *original* installation date).

Energy usage reported by the UPS

For some UPS devices, cumulative energy from your UPS is displayed in the **Cumulative energy from your UPS** field at the bottom of the screen. This will always correspond to the kWh on the UPS LCD. It is the total energy usage of the UPS, so will also include any energy used prior to the PowerChute installation.

If you replace the UPS supporting your server with another UPS, the existing energy report values are not deleted.

Energy Settings

With this screen, you can change the country used in energy calculations, the cost of your energy, and your CO2 emissions calculation.

If you change your country here, ALL historical values, including CO2 emissions, are deleted. This is because energy costs vary between countries, so the historical costs would be very likely inaccurate.

The country selected is used to calculate average costs. However, if you know your energy costs from your electricity bill, then you can use the **Cost per < Kilowatt/Pounds>Hour** column to input a different value.

Click on the **plus symbol** at the foot of the **Energy Cost History** table to add another row.

Click on the **pen icon** to edit a row and the **bin icon** to delete a row.

If you delete a row, it will not be used in any future energy calculation.

Energy calculation

The costs and dates on display here combine to generate the report on **Energy Reporting**.

For example, suppose your screen by default displays 04/25/2017 with a cost of 0.1. You add a row with a date of 10/30/2017 and a cost of 0.15.

For the example, let’s say today’s date is January 3, 2018 (displayed as 01/03/2018).

In calculating the total cost, the Energy Reporting screen uses the 0.1 cost per hour for the dates 04/25 to 10/29 in 2017, and the 0.15 cost per hour for the period from 10/30/2017 to 01/03/2018.

About

The About dialog provides information about the UPS, and the system connected to the UPS.

UPS Information Parameters

Parameter	Description
UPS Model	The model name of the UPS, e.g. Smart-UPS 750.
UPS SKU	The SKU of the UPS, e.g. SMT750.
Firmware Revision	The revision of the UPS firmware. **NOTE:** This value does not display for all UPS devices.
Manufacture Date	The date that the UPS was manufactured.
Serial Number	The serial number of the UPS. This number is also printed on the label of the UPS.
Battery Installation Date	The date the UPS battery was installed.
UPS Name	The UPS name, as defined on the **UPS Settings** page.

Protected System Information

Parameter	Description
Server Name	The name of the server connected to the UPS on which the PowerChute Agent is running.
IP Address	The IP address(es) of the server connected to the UPS.
Operating System	The operating system running on the server connected to the UPS.
UPS Communication Port	The communication port on the server to which the PowerChute Agent is connected.
Contact Name	The contact name assigned to the server connected to the UPS.
System Location	The location of the server connected to the UPS.

Product Version

Parameter	Description
PowerChute Serial Shutdown Agent Version	The version number of the PowerChute Serial Shutdown Agent running on the server.
Java Version	The version number of Java running on the server. To update the Java version used with PowerChute, see **Java Update**.

General

PowerChute Configuration File

PowerChute stores some configuration settings in a file called `pcssconfig.ini`, located in the Agent directory in the installed PowerChute directory. If the default location was chosen during installation, the `pcssconfig.ini` file can be found at:

- `C:\Program Files\APC\PowerChute Serial Shutdown\agent` for Windows systems
- `/opt/APC/PowerChuteSerialShutdown/Agent/` **for Linux systems**

It is not recommended to edit the `pcssconfig.ini` file directly as this may lead to invalid configurations.

It is not recommended to delete the `pcssconfig.ini` or `pcssconfig_backup.ini` files from the installation directory. Deleting these files will result in the PowerChute service not starting, and PowerChute must be uninstalled and re-installed.

PowerChute stores the below settings to the configuration file:

- **Scheduled Shutdown**
- **SNMP Settings**

:SNMPv3 passphrases are not saved to the configuration file as they need to be stored securely. When the configuration file is copied over to another machine, you must manually enter the passphrases. For more information, see Knowledge Base article FA360658.

- **Changing Language**

After you have configured one installation of PowerChute, you can use the `pcssconfig.ini` file to apply the same configuration to another copy of PowerChute on a different machine.

To apply the settings on the target machine:

1. Stop the PowerChute service. For more information, see Knowledge Base article **FA360654.**
2. Replace the existing copy of `pcssconfig.ini` in the Agent directory.
3. Start the PowerChute service.

Resetting your Username and Password

If you have forgotten the username or password created during installation, you can reset the credentials by using the `pcssconfig.ini` file:

1. Open the `pcssconfig.ini` file with a text editor (e.g. Notepad) and add the following:

```
[Credentials]
username=
password=
```

Enter the new username and password directly after the equals sign.

- The username must be between 6 and 128 characters in length.
- The password requires:
  - Minimum 8 and maximum 128 characters in length
  - 1 upper and lower case letter
  - 1 number or special character
  - The username cannot be part of the password.

NOTE: The username and password cannot contain double-byte characters.

2. Save the `pcssconfig.ini` file.
3. Restart the APC PBE Agent service. See Knowledge Base article **FA360654.**
4. If the username and password meet the requirements, the `[Credentials]` section is deleted from the `pcssconfig.ini` file, and the new credentials are ready to use.
   - If the credentials entered in `pcssconfig.ini` do not meet the requirements, an error is written to the file. Check the file for the error, adjust the credentials accordingly, and restart the Agent service.
5. Log in to the PowerChute web interface with your new credentials.

Java Update

The Java Update feature enables you to change the Java Development Kit (JDK) used by PowerChute to any other JDK already installed on your system. Follow the steps below to update the Java version used by PowerChute:

1. Download a valid JDK on your system. JDKs can be downloaded from the **Adoptium OpenJDK website**.



PowerChute v1.5 ships with latest version of Adoptium OpenJDK release. You can only update the Java version used with PowerChute to a 64-bit JDK.

The Java versions supported by PowerChute are detailed in the **OS Compatibility Chart**.

2. Navigate to the PowerChute installation directory, and create a new folder called “Updates”. If the default installation directory was chosen during installation, this location will be:
   - `C:\Program Files\APC\PowerChute Serial Shutdown\Updates` for Windows systems
   - `/opt/APC/PowerChuteSerialShutdown/Updates/` for Linux systems
3. Copy the Java file (tar.gz or zip) downloaded in Step 1 above to the Updates directory.
4. Navigate to the **About** dialog in the PowerChute UI. Under **Software Updates**, the downloaded Java file will be listed in a drop-down box in the **Java Update Available** field.
5. Select the Java version you want to update PowerChute to use from the drop-down box, and click **Update Java**.
6. An authentication dialog will appear asking for your PowerChute credentials if you are upgrading the Java version used for the first time. Enter your credentials and click **Sign In**. Upon successful authentication, the Java upgrade process begins.
7. PowerChute restarts automatically during the Java upgrade process. Wait 3-5 minutes for the Java version to successfully update.
8. When the PowerChute service restarts, refresh your browser and navigate to the **About** dialog. The **Java Version** field will be updated to show the new Java used by PowerChute.

Replace Default PowerChute SSL Certificate



For more information on how to replace the default PowerChute SSL certificate, see the **PowerChute Serial Shutdown Security Handbook**.

Third Party Licenses

Third party licenses used in PowerChute Serial Shutdown are available to view in the THIRDPARTYLICENSEREADME.txt file in the Agent directory. If the default location was chosen during installation, this text file can be found at:

- `C:\Program Files\APC\PowerChute Serial Shutdown\agent` for Windows systems
- `/opt/APC/PowerChuteSerialShutdown/Agent/` **for Linux systems**

Preferences

Customer Experience Improvement Program (CEIP)

PowerChute's Customer Experience Improvement Program (CEIP) provides us with the information that enables us to improve our product and services, and helps us to advise you on how best to deploy and configure PowerChute.

As part of the CEIP, we will collect certain information about how you configure and use PowerChute Serial Shutdown in your environment. This information is completely anonymous, and cannot be used to personally identity any individual. For more information, please refer to the **CEIP Frequency Asked Questions**.

By default, you are participating in the PowerChute CEIP. If you prefer not to participate, unselect the **Join PowerChute Customer Experience Improvement Program ("CEIP")** checkbox in the PowerChute Customer Experience Improvement Program page. You can join or leave the CEIP at any time.

PowerChute Updates

PowerChute automatically checks for updates and informs you if a new version of the software is available to download. This update check sends anonymous PowerChute environment data to the Schneider Electric update server.

The **Enable PowerChute Updates** checkbox is selected by default. If you prefer to opt-out of checking for updates, unselect this checkbox.

Troubleshooting

PowerChute Files ZIP Archive

To help the PowerChute team resolve customer issues, the PowerChute files ZIP archive feature creates a ZIP archive of the necessary PowerChute configuration files for troubleshooting. This feature can be found in the **Troubleshooting** section in the **About** dialog. This ZIP archive will be saved in the Agent directory in the installed PowerChute directory. If the default location was chosen during installation, the `PcssFiles-<TimeStamp>.zip` file can be found at:

- `C:\Program Files\APC\PowerChute Serial Shutdown\agent` for Windows systems
- `/opt/APC/PowerChuteSerialShutdown/Agent/` for Linux systems

The PowerChute configuration files exported to the ZIP archive are:

energylog directory	DataLog file
etc directory	EventLog.txt file
EventLog_Eng.txt	cmdfile.log file
log directory	pcssconfig.ini file
comps.m11 file	PCSS-Summary.json file
critical.cfg file	proclog.txt file
data.dat file	

If you have a PowerChute customer issue, contact your regional **Technical Support team**, and provide the `PcssFiles-<TimeStamp>.zip` file to help resolve your issue.

Worldwide Customer Support

Access to customer support terms may vary by product. Customer support is available in the following ways:

- Visit the Schneider Electric web site, to access documents in the Schneider Electric Knowledge Base and to submit customer support requests.
  - **www.se.com** (Corporate Headquarters)
    Connect to localized Schneider Electric web site for specific countries, each of which provides customer support information.
  - **www.se.com/support/**
    Global support searching Schneider Electric Knowledge Base and using e-support.
- Contact the Schneider Electric Customer Support Center by telephone or e-mail.
  - Local, country-specific centers: go to **www.se.com/support** for contact information.

For information on how to obtain local customer support, contact the Schneider Electric representative or other distributor from whom you purchased your Schneider Electric product.

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this publication.
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