Chapter 20
Restart

HCA is a program different than others that you may run on your computer. Unlike an email program or a word processor which you may start and exit many times a day, HCA is designed to be running almost all the time. Because of this when HCA is started and stopped, special things can happen.

Whenever HCA is started it attempts to pick up where it left off when it was shutdown. Of course, if it is starting for the very first time HCA has no prior state so it just begins. But from that point on when HCA is started, it is restarting from some prior shutdown.

This restart could happen after a power failure or after you selected Shutdown from the File menu

While restart after a normal shutdown will be explained, the most important use of this feature is to recover after a power failure.

Power failure detection and recovery is a very complex area. In general terms, the goal of power failure recovery is to restore the state of HCA and your home to what it would have been if the power had not failed.

Example: Suppose that HCA is active and the power fails at 7 p.m. When the power is restored at 8 p.m., HCA attempts to:

1. Make sure that lights that were on at 7 p.m. are turned on.

2. Make sure that any lights that should have come on between 7 p.m. and 8 p.m. also come on.

3. Make sure lights that were on at 7 p.m., and were scheduled to be off by 8 p.m. are not on.

Of course, more than just lights may be involved, and HCA checks and corrects status for **all** participating devices, programs, and groups. In fact, HCA will restart programs that were running when the power failed at the point they were interrupted. If the programs were executing delay or wait elements at that time, they are restarted and take into account the lost time due to the power failure.

This chapter discusses power failure and recovery, and includes:

- Types of power supply
  - No uninterruptible power supply
  - Using uninterruptible power supply
- Controlling restart
- Restart from a normal shutdown
- Some hints about power failure and recovery

Types of power supply

HCA handles power failure recovery differently, depending on whether the computer is or is not connected to an Uninterruptible power supply (UPS). HCA has been designed to work with any UPS because it doesn't actually communicate with it.

No uninterruptible power supply

If you are not using a UPS, and you enable power failure recovery, then while the power is on, HCA writes information to the disk about once a minute. This information includes the current time, state of all devices, and information on the state of any running programs.

When the power fails, the computer powers down and this stops HCA as well. When power returns, the computer restarts. Windows loads, and if HCA is in the Windows StartUp group, HCA restarts. If the HCA StartUp properties are set to reload the last design, HCA then performs three steps:

1. HCA determines that the power has failed by looking on the disk for the file that it has been writing its state to.

2. Once it finds that file, HCA should know the approximate time the power failed (to the nearest minute), and the state of all devices.

3. HCA looks at the current schedule and determines what would have happened during the time power was out, and restores all devices, programs, groups, and schedule entries.

UPB and Insteon Devices don't require HCA to keep track of their state. All these devices have their power restored to the state they were in when power was lost. HCA does have to restore them in accord with the current schedule like it does forall devices. This is described later in this chapter.

Hint: To add HCA to the Windows StartUp group, search for "StartUp" in Windows Help. Read and follow the directions in the topic, "Starting a program each time Windows starts."

Using an uninterruptible power supply

If your computer is attached to a UPS, nothing described above is done differently except that the state file may not be written until the house power has failed. Once the power returns, power failure recovery is as described above.

If, however, you have a UPS and the power fails but is not out long enough to drain the UPS batteries, HCA just needs to know the power has failed and when the power has returned. When power has been restored, HCA restores the state of your home.

None of this power failure recovery happens **unless**:

- The restart option is checked

- HCA is added to your Windows startup group

- The Startup option *Reopen the last design loaded* is checked

Additionally, you can independently set each device, program, and group to participate or not participate in power failure recovery. You do this in the device, program, and group properties, with the power failure recovery options.

HCA really doesn't know that the power has failed

The odd thing about all this "power out" talk is that HCA doesn't really know that the power has failed. What it does know is that one of its power line interfaces plugged into the wall is no longer communicating with the computer. If it stops communicating HCA reports this as a power failure and acts accordingly.

Controlling restart

There are many different ways to control the actions of Restart. To start with, the whole feature can be enabled or disabled from the HCA Properties dialog on the Startup tab.
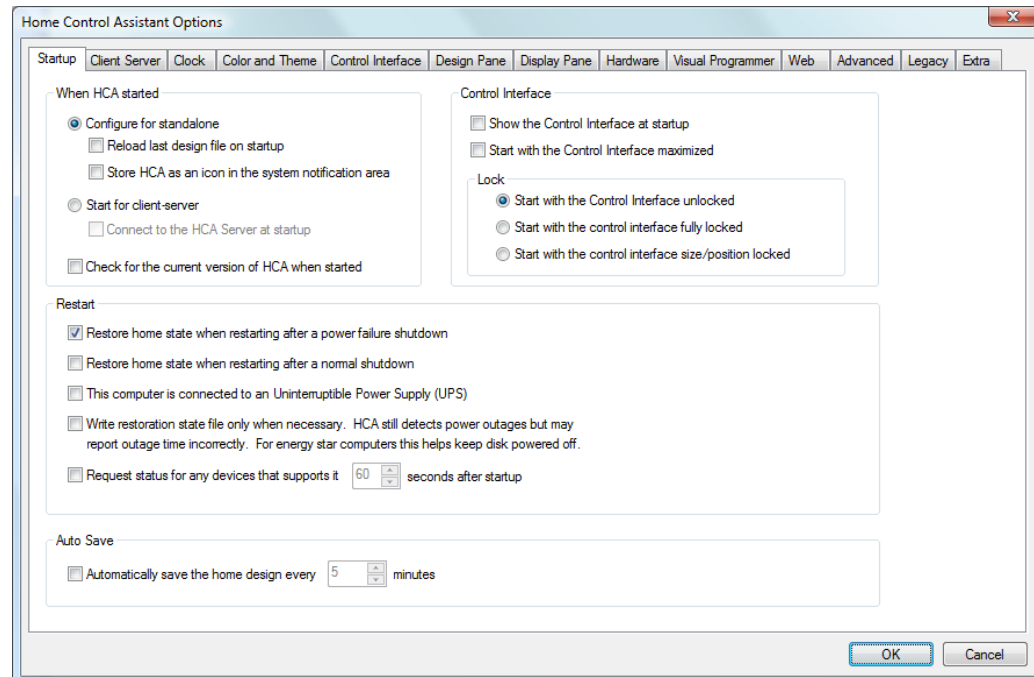
The first two options in the Restart group enable or disable the restart feature in the case of a normal or power failure restart.

The next option is for having a UPS as described above.

The next option in the section controls how often the state file is written. For computers that power off their hard drives after some period of inactivity, having HCA write the file once a minute defeats this. This option attempts to limit the writes to the state file to only when something has changed.

One important point you should be aware of if the state file write limit option is used. When HCA restarts after a power failure it shows the time and date of when the power failed and when it is restarted. If this option is used it may report an incorrect time for the power failure.

The final option of this section directs HCA that when started, to poll all devices that support status requests. This updates HCA's internal state to the device's state. It's best to wait a bit after startup before these polls happen so that they don't compete with any programs that run upon startup or HCA transmissions to restore state.

In addition to these options which turn on or off restart, you can also control restart on an individual device, program, or group basis.

For example, in the case of a device, these options are on the Restart tab of the device properties.
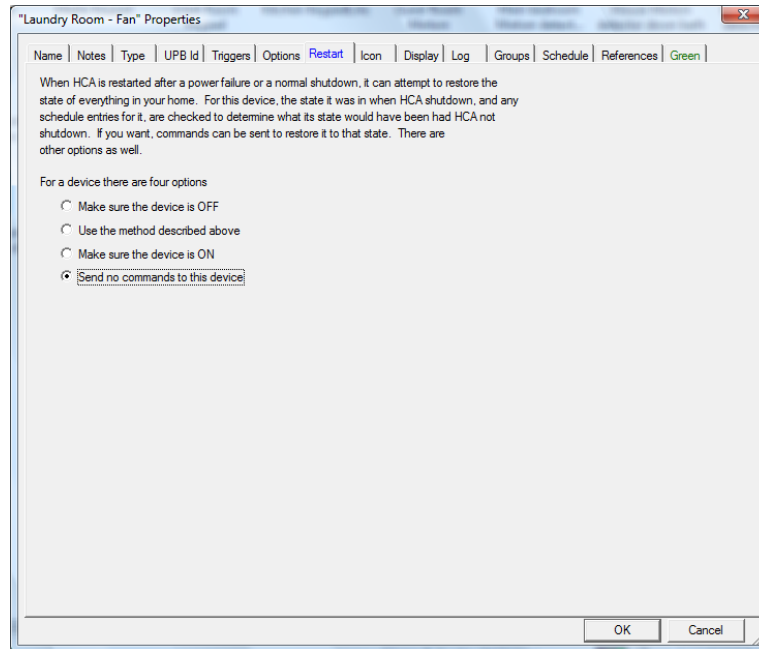
The restart options for the device allow you to control restart for just this device. Similar options are available from devices, programs and groups.

Restart from a normal shutdown

Up until now all the discussion has focused on restart after a power failure. What is different when starting after a normal shutdown? Almost nothing. HCA still has a state file that is marked with the time of the shutdown. That state file contains the state of all devices, the current schedule, all the values of the flags, etc.

When HCA starts after a normal shutdown it proceeds as described above. That is, it catches up to where it would have been if it had not been shutdown.

Restart from a normal shutdown must be enabled as one of the options on the Startup tab as shown above.

Some final information about power failure and recovery

Here is some additional information about restart

- **Restart is a very complex subject and this brief explanation is discussed in much more depth in a technical note on the support web site.**

- Power failure recovery is so complete that you may not notice that power has failed while you were out. Check the log—entries are made when power fails and when it is restored.

- If you are using an uninterruptible power supply, make sure that you power only the appropriate parts of the interface hardware from the UPS. Any interface that would plug into a wall outlet needs to be not plugged into the UPS.

- When HCA is restoring from a power failure, devices in your home are sent commands to control them. If your home contains devices where it doesn't make sense to set their level – like a device that makes noise – set their restart option to "send no commands to this device".

- If you want to have a specific program run when a power outage is detected (of course, the computer must be powered by a UPS) or when power is restored, there are triggers for this. Add a trigger of the *Special Trigger* type and choose the trigger type you want.

- For restart to happen after a power failure your computer must start, log in, and start HCA. Use the web to find ways to automatically log in when the computer starts and how to automatically start a program when Windows starts.