

Ingersoll Rand Comments (red font) on the ENERGY STAR Residential Climate Controls Discussion Document
October 2011

The U.S. Environmental Protection Agency (EPA) recognizes and appreciates Residential Climate Controls stakeholders' support of the ENERGY STAR program and interest in helping EPA develop requirements for this product category. While work continues on the usability test method that will play a central role in this specification, EPA is working with stakeholders on establishment of other aspects of the specification such as those included in the attached ENERGY STAR Residential Climate Controls Discussion Document.

This ENERGY STAR Residential Climate Controls Discussion Document is intended to engage stakeholders in the further development of the ENERGY STAR Climate Controls specification. Included in this document are EPA's initial thoughts on the relevancy of remote interfaces, humidity sensing and rate tier display. EPA will host a conference call on November 2 to discuss the proposals in this document with stakeholders. EPA also welcomes written comments received via email to ClimateControls@energystar.gov; those received no later than November 11, 2011 will inform Draft 3 of the requirements. Comments received after that date will be considered as part of the Draft 3 comments process.

Considered Changes to Residential Climate Controls Requirements

EPA has evaluated stakeholder input regarding the requirements in the most recent Draft 2 Version 1.0 Climate Controls Specification and is considering the following refinements.

I. Remote Interfaces

Communicating Residential Climate Controls that may be managed by *Remote Interfaces* (RIs), such as smartphone apps and PC web browser control interfaces, have come to market in greater number over the last few years. EPA believes this emerging shift to remote energy management presents significant opportunities for energy savings. Recognizing this market shift, EPA is considering allowing Residential Climate Controls with remote interfaces to earn the ENERGY STAR.

EPA anticipates that both the performance-based and prescriptive paths, as proposed in the Draft 2 Version 1.0 Climate Controls specification, the previous Draft Usability Framework, and the Draft Usability Performance-Based Test Method, could be adapted to allow evaluation of climate controls with RIs. In addition, EPA is considering a modified requirement that would allow for streamlined testing of Residential Climate Controls with RIs that are qualified for usability. These Residential Climate Controls would need to be associated with one or more RI(s) that comply with performance-path tasks #1 – 5 or prescriptive path requirements #6 – 11. Such Residential Climate Controls would need to include the ability for the consumer to set the date and time and to create or modify HVAC schedules. However, required performance-based tasks would be reduced to tasks 2, 3 and 5. Task 1, Set Date & Time and Task 4, Modify Program Schedule would not be required for the Residential Climate Control. Under this proposal these functions would be provided by one or more RI(s) associated with the Residential Climate Control and demonstrated to comply with performance-path tasks 1 and 4. EPA believes these provisions will enable lower cost products by encouraging these more complex and interactive tasks to be performed from RI(s) on devices such as PCs, smartphones & tablets that are likely to foster a better user experience.

¹ EPA is further considering additional prescriptive requirements that define suitable base levels of functionality for Residential Climate Controls qualified with RIs. For example, EPA believes that Residential Climate Controls should provide the user with control and indication of:

- room temperature,
- setpoint,
- HVAC mode,
- fan mode,
- energy saving/away mode, and

- long-term hold

EPA is considering the following RI types:

PC RI (dedicated software or web interface),

Mobile/Other RI (includes apps and mobile web interfaces for smartphones & tablet computers, and “other” control interfaces such as energy management displays and security systems)

In order to provide an overview of the full set of qualification criteria and how they would apply, EPA has provided Figure 1, which illustrates these requirements in a flowchart format.

Information to Consumers

To incorporate Climate Controls with RIs into the specification, EPA is considering the following packaging requirements: Packaging for qualified Residential Climate Controls must identify additional hardware or software requirements to enable communications (e.g. “Must have mobile device with Wi-Fi and running iOS x.y or later or Android z.k or later”, or “Must have an 802.11 B/G/N WiFi network in the home”). Packaging for qualified Residential Climate Controls evaluated to the streamlined performance-based usability path (tasks 2, 3 and 5, i.e. not including testing of HVAC programming or Date/Time adjustment), must identify one or more associated RI(s). **Special packaging/labeling requirements should not apply for professionally installed products. Marketing literature and web sites can adequately communicate features and requirements for controls that are professionally installed.**

Questions for Discussion

1. What are the perceived implications of allowing RI(s) into the Climate Controls specification? **Remote interface will save energy by providing a simple and convenient method of remotely turning their HVAC system heat cool settings up or down while at home or more importantly “Away” to reduce energy usage and cost of operation. Programming on a PC would also allow an easy method of programming so that a low cost programmable thermostat compatible with previous Energy Star requirements could be programmed and could control the HVAC system remotely.**
2. The previously proposed prescriptive-path includes ‘single user action’ requirements intended to ensure quick access to setpoints and Away mode. To ensure quick access to these settings from an RI, should EPA retain ‘single user action’ requirements, after the RI is launched? **No, the advances in user interface designs have made multi-touch or multiple actions with clicking a mouse a very simple method of making setting adjustments. Let the consumer decide what they like in the way of control designs.i.e. iPhone, Blackberry, Android phone, etc.**
3. EPA understands that it would be possible for one company to produce the hardware of a Climate Control (OEM) and another to write an RI to control it (3rd party). If sufficient information on the Climate Control is publicly available, the 3rd party could write an RI independent of the OEM. What are the advantages and disadvantages of limiting listing of 3rd Party RIs to only to those approved by the OEM? **Open protocols should allow the code for 3rd party RIs to be written and certified with OEM controls. The 3rd party RI developer should be required to provide support (800#).**

What would be an appropriate mechanism for OEMs to indicate approval?

The OEM and RI developer should own the responsibility of listing the climate controls or RIs that their respective products are certified with. The respective manufacturer’s web site is the preferred method of identifying the approved RIs or Thermostats.

4. What is the appropriate minimum functionality for a Climate Control intended to be paired with one or more RI? **System Modes, Heat/Cool set points, 7 day programming, Permanent Hold (same as Energy Savings Mode requirement now that ESM allows multiple single touches to enable).**
5. Climate Controls associated with listed RI(s) may be eligible for evaluation to a streamlined version of the usability test. EPA envisions defining a subset of tasks to perform locally on the Climate Control.

What are the implications of this approach? When a RI (PC or Cell-phone) is available for test usability testing of the control itself should be waived.

6. For streamlined qualification of Residential Climate Controls to the performance-based path, EPA is proposing waiving Task 1, Set Date & Time and Task 4, Modify Program Schedule. Is this a reasonable approach that will encourage qualification of lower cost products? When paired with an RI, is it likely this combination would provide a high quality package to the consumer?

Yes, in fact all thermostat usability should be waived when a RI is available because when you are away and have a need to adjust the HVAC set points, you will now have an easy method of doing this remotely or in the home via your cell phone. Having remote access is more important than limiting the setpoint while away. If the occupants want to save energy they will use the RI to adjust or turn off their system completely while away. This will allow lower cost solutions for Energy Star controls that offer RIs.