

**Date:** February 18, 2011

**To:** Daikin Sales, Service and Distribution

**Subject:** Version 6.02 Software Upgrade for Intelligent Touch Controller DCS601C71

In response to market demand, Daikin AC is pleased to announce a new Intelligent Touch Controller software upgrade (hereafter referred to as V6) with advanced features for use with the VRV, SkyAir, and Split System family models (See table below). Hereafter ITC stands for Intelligent Touch Controller.

The new software has been specifically designed to meet the requirements of the North American Market. The control features, which are unmatched in the VRF industry, have been improved in comparison to the current version and now provide the following benefits:

- Advanced zone configuration and greater application flexibility with features such as setback setpoints, setpoint range limit, and auto-changeover
  - All are now accessible through the web with web option activation
- Individual cooling and heating setpoints in the occupied period (unit on)
- Independent cooling and heating setback setpoints in the unoccupied period (unit off with setback)
- Independent cooling and heating occupied setpoint range limits
- Setback setpoints outside of occupied setpoint range (40°F-95°F)
- 7-day, 5+2, 5+1+1 weekly scheduling with individual occupied or setback cooling and heating setpoints for year long schedule (seasonal schedule no longer necessary)
- 8 individual schedules with up to 8 On/Off actions per day and 40 exception days per schedule
- Auto-changeover for Heat Pump and Heat Recovery systems based on independent setpoints

Other changes include:

- Temperature Limit Mode has been replaced by the flexible Setback Mode
- Heating Optimization is no longer available
- Version 6.02 also corrects issues apparent in Version 6.00

**Applicable Models**

All VRV Family Indoor Models	FXAQ, FXDQ, FXFQ, FXHQ, FXLQ, FXMQ, FXNQ, FXOQ, FXSQ, FXTQ, FXZQ
SkyAir Indoor Models	FAQ, FCQ, FHQ, FTQ
SkyAir Indoor Models (with KRP928B2S)	FTXS
Single Split, Multi-Split Indoor Models (with KRP928B2S)	CTXS, FDXS, FTKN, FTKS, FTXN, FTXS
Quaternity (with KRP928B2S)	FTXG

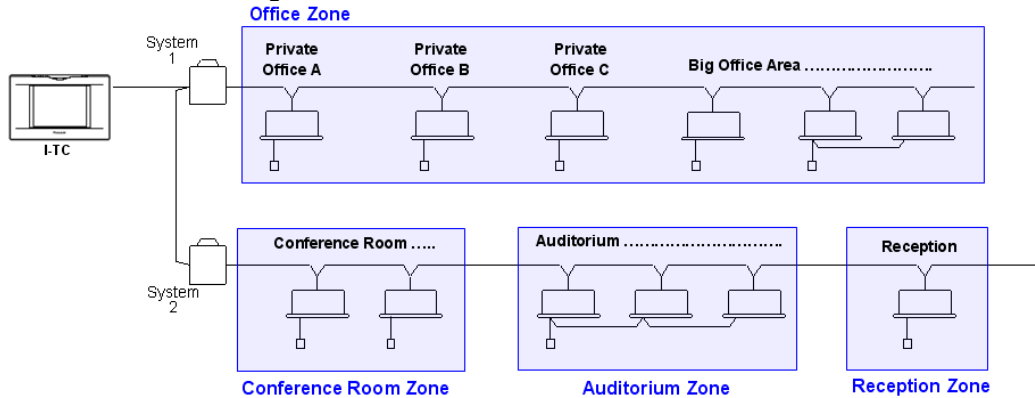
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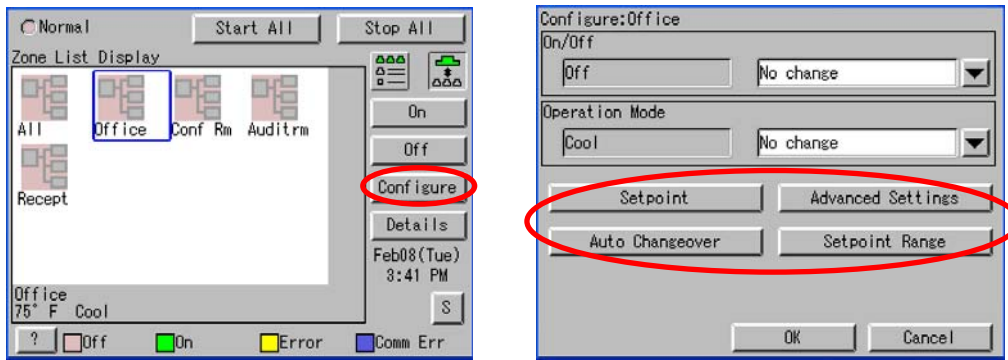
## Control Zones

With V6 comes the introduction of Control Zones which is a grouping of units with similar control characteristics. See Figure 1.

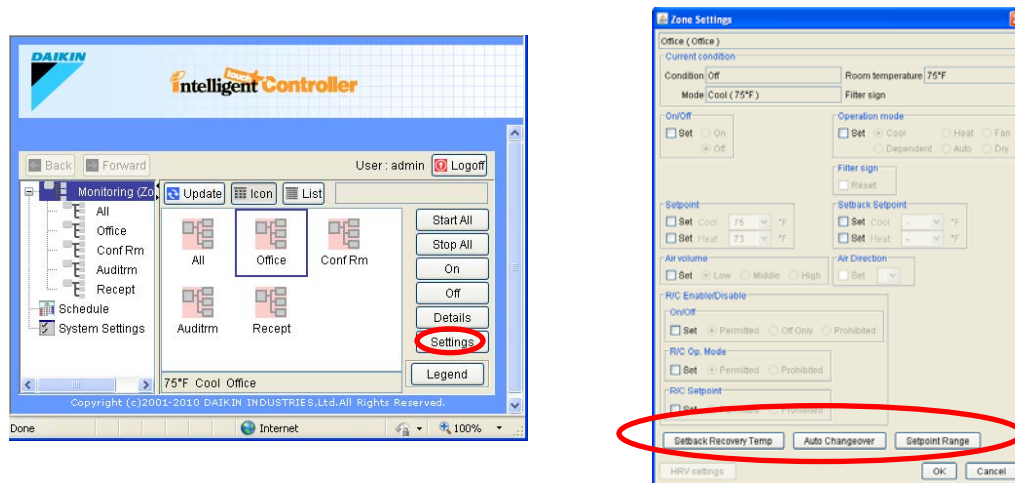


**Figure 1 – Control Zones**

Configuration of advanced features such as Setback, Auto-changeover, and Setpoint Range Limit have been moved to the Zone Configuration Screen which is accessible from the main screen on the ITC or through the Web Option. See Figures 2 and 3.



**Figure 2 – Control Zone Configuration (ITC)**



**Figure 3 – Control Zone Configuration (Web Option)**

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## Independent Occupied and Setback Setpoints

ITC V6 software brings control of occupied and unoccupied (setback) modes of operation introduced in the BRC1E71 Navigation Remote Controller to the zone level. In the occupied mode, the unit is on and controls to active setpoints. In the unoccupied period with setback enabled, the unit is off and shall energize once setback setpoints have been reached. It will de-energize once the temperature has dropped (when cooling) or risen (when heating) the set differential, which is configurable in the zone configuration menu.

Temperature control is achieved by independent cooling and heating setpoints in cooling, heating, or Auto-changeover. For occupied and unoccupied (setback) operation, in the cooling mode only the cooling setpoint shall be valid and the heating setpoint shall be ignored and vice-versa. Both setpoints shall be valid in Auto-changeover. See the section below on Auto-changeover for details on the sequence of operation.

## Setpoint Range Limit

Each setpoint can be bound by a range limit in order to maximize energy savings. The cooling and heating setpoint ranges can be set between 60°F (16°C) and 90°F (32°C) for occupied operation (unit on). The cooling setpoint range shall be equal or higher than the heating setpoint range. The cooling and heating setback setpoints can be set between 40°F (5°C) and 95°F (35°C) outside of the occupied setpoint ranges. See Figure 4.

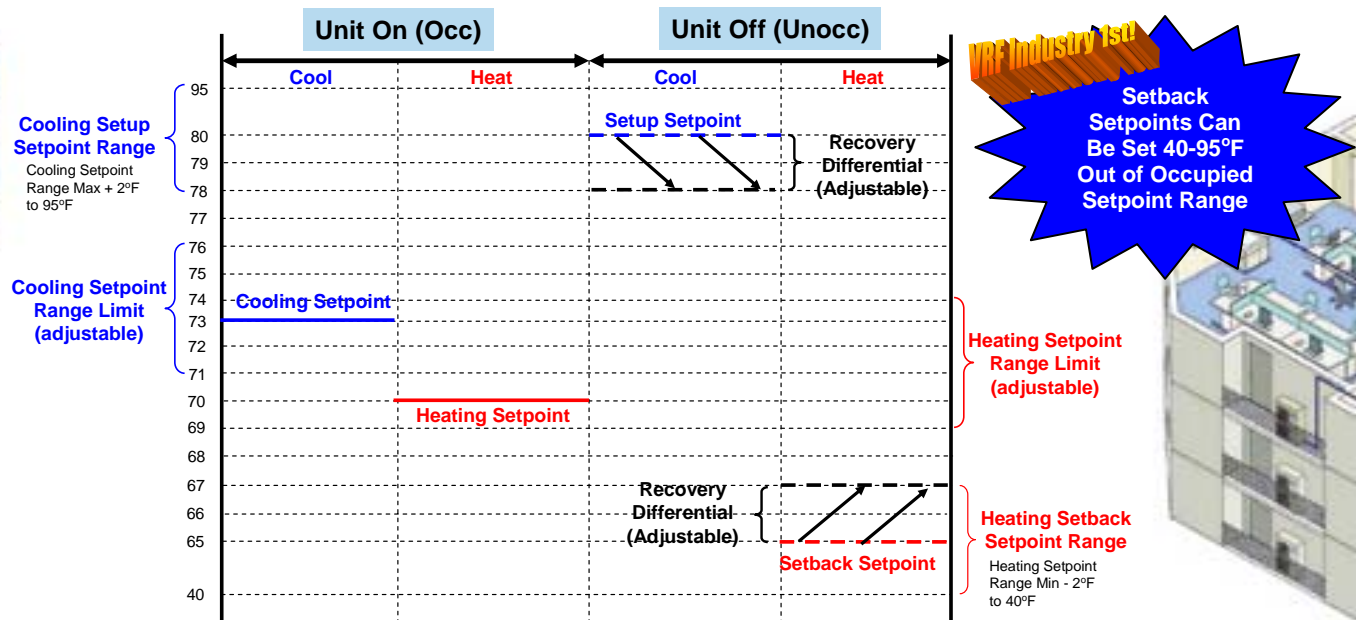


Figure 4 – Setpoints and Setpoint Range Limits

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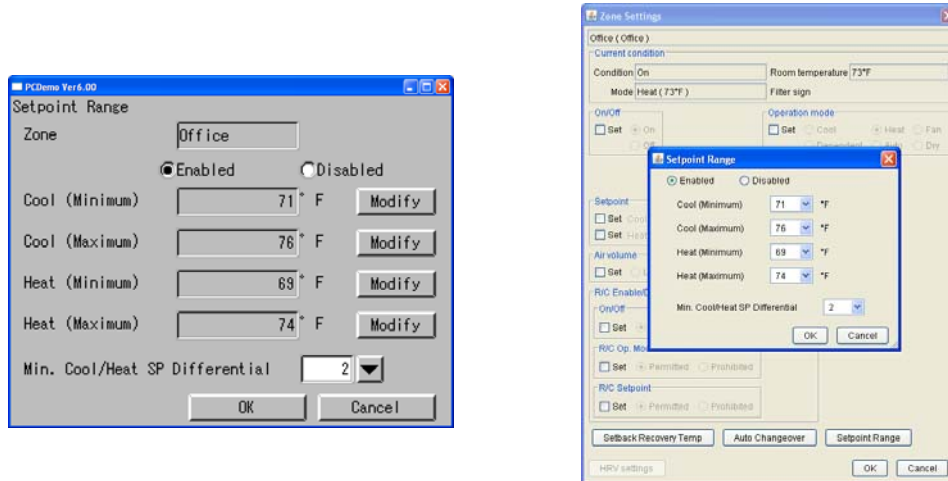
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## Minimum Setpoint Differential

To maximize energy savings, the dead-band between cooling and heating setpoints can be maintained by setting a minimum setpoint differential. The range is 0 to 7°F (0 to 4°C). The minimum differential can also be set to 0\* which eliminates the dead-band and forces heating and cooling setpoints to track each other (Single Setpoint Mode).

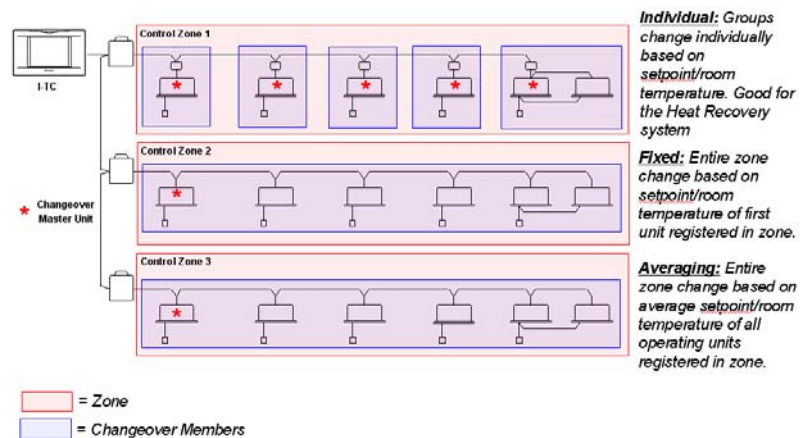
0\* should be used in conjunction with the BACnet® or LON® Interface as they work with one setpoint object or network variable in the current operation mode.



**Figure 5 – Setpoint Range Limits and Minimum Setpoint Differential Configuration (ITC & Web Option)**

## Auto-changeover

The ITC V6 Auto-changeover allows the optimal room temperature to be maintained without the user having to change the mode by automatically switching the indoor unit's mode (heat or cool) according to the room temperature and temperature setpoint of the unit or average room temperature and average setpoint of a group of units. There are three methods of Auto-changeover in the ITC V6. Individual, Fixed, and Averaging. See Figure 6 below.



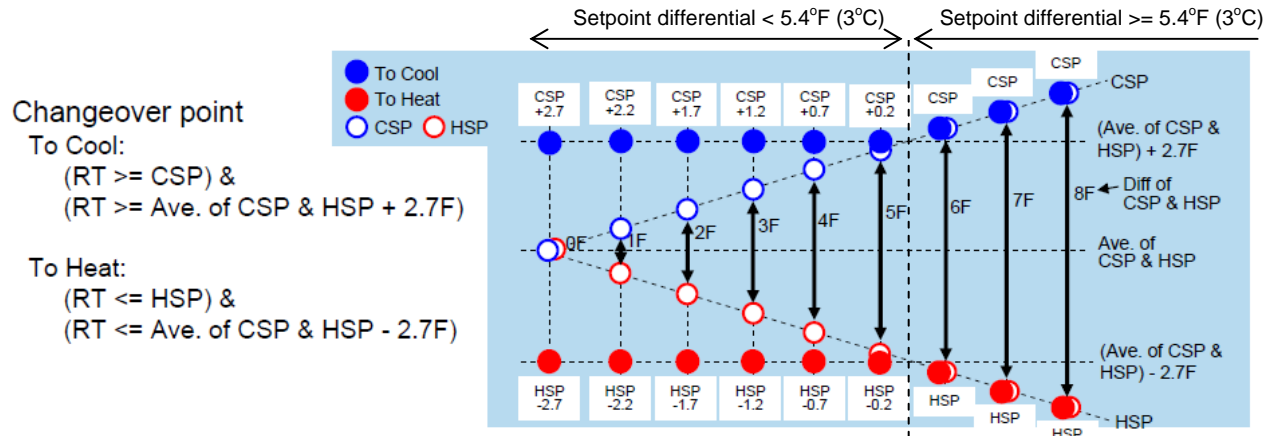
**Figure 6 – Three methods of auto-changeover**

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When the setpoint differential is greater than or equal to 5.4°F (3°C), changeover to cooling mode shall occur at cooling setpoint. Changeover to heating mode shall occur at heating setpoint. When the setpoint differential is smaller than 5.4°F (3°C), changeover to cooling mode shall occur at 2.7°F (1.5°C) above the average of the cooling and heating setpoints. Changeover to heating mode shall occur at 2.7°F (1.5°C) below the average of the cooling and heating setpoints. See Figures 7 to 10 below.



**Figure 7 – Changeover Point versus Setpoint Differential**

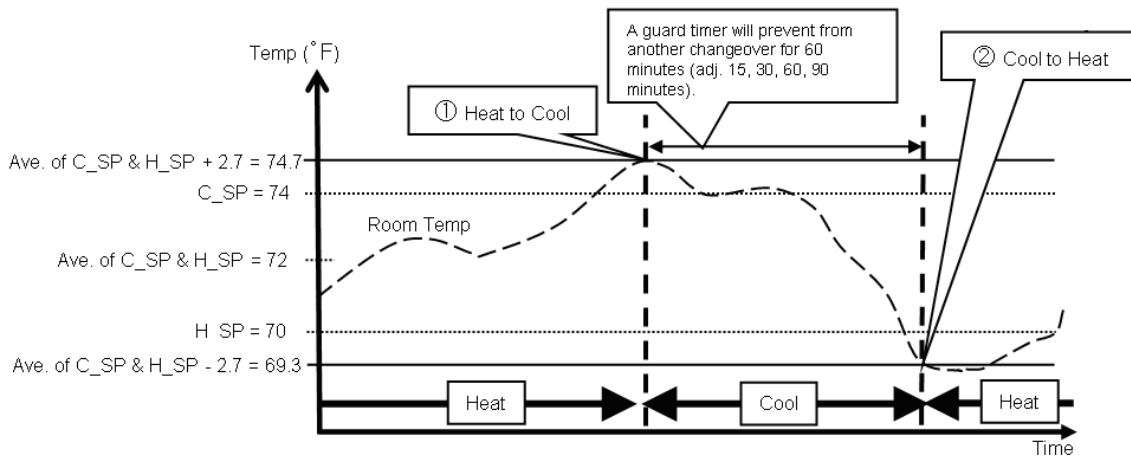
**CASE 1)**

When the difference between Cooling Setpoint (C\_SP) and Heating Setpoint (H\_SP) is less than 5.4°F (3.0°C).

- ① Change to Cool mode: Main room temp ≥ Average of C\_SP & H\_SP + 2.7°F (1.5°C)
- ② Change to Heat mode: Main room temp ≤ Average of C\_SP & H\_SP - 2.7°F (1.5°C)

**Example:** In case of C\_SP = 74°F and H\_SP = 70°F,

- ① Change to Cool mode at Main room temp ≥ 74.7°F ← (74 + 70) / 2 + 2.7
- ② Change to Heat mode at Main room temp ≤ 69.3°F ← (74 + 70) / 2 - 2.7



**Figure 8 – Example: Auto-changeover with Setpoint Differential less than 5.4°F (3.0°C)**

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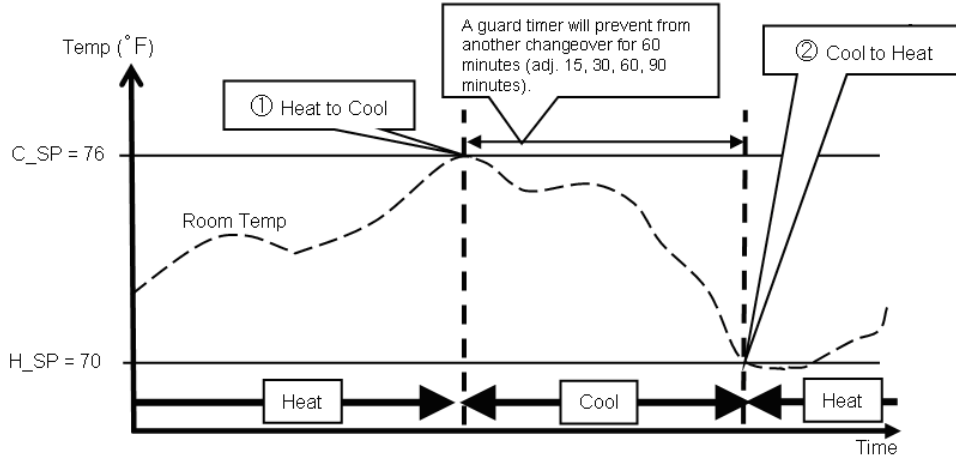
**CASE 2)**

When the difference between Cooling Setpoint (C\_SP) and Heating Setpoint (H\_SP) is equal to or greater than 5.4°F (3.0°C).

- ① Change to Cool mode: Main room temp  $\geq$  C\_SP
- ② Change to Heat mode: Main room temp  $\leq$  H\_SP

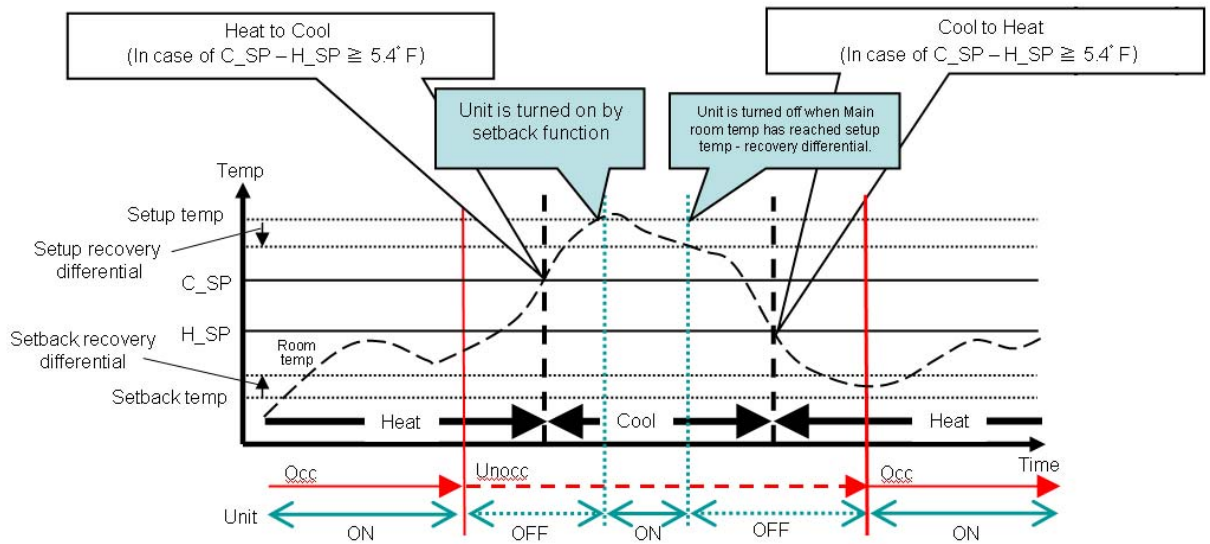
**Example:** In case of C\_SP = 76°F and H\_SP = 70°F,

- ① Change to Cool mode at Main room temp  $\geq$  76°F
- ② Change to Heat mode at Main room temp  $\leq$  70°F



**Figure 9 – Example: Auto-changeover with Setpoint Differential greater than or equal to 5.4°F (3.0°C)**

**Example: Combination of Changeover and Setback**



**Figure 10 – Example: Combination of Auto-changeover and Setback**

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## Schedule

ITC V6 has 8 independent schedules available with 40 exception days per schedule. Exception days can be a set date (Jan 1) or floating (2<sup>nd</sup> Sunday in May). Each schedule has three selectable weekly schedule pattern options: 7-Day, 5+2 (weekday + weekend), and 5 + 1 + 1 (weekday + Saturday + Sunday). The schedule supports up to 8 operations per day. Functions able to be scheduled per operation include On/Off, Operation Mode, Occupied Cooling Setpoint, Occupied Heating Setpoint, Setup Cooling Setpoint, Setback Heating Setpoint, Remote Controller On/Off Prohibit, Remote Controller Mode Prohibit, Remote Controller Setpoint Prohibit, and Timed Override Enable. See Figures 11 and 12 below.

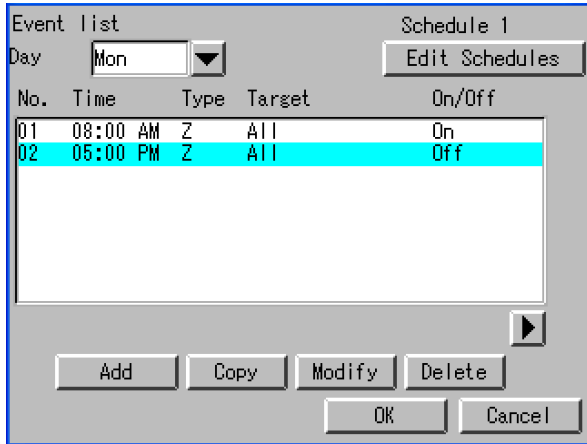


Figure 11 – Schedule Setup (ITC & Web Option)

Comfort setpoints when the unit ON  
Setup/setback setpoints when the unit OFF

Day	Time	Target	On/Off	Op. Mode	Setpoint	R/C buttons	Override
Weekday	6:00am	Office Zone	ON	No Change*	No Change*	Permit On/Off	n/a
	8:00am	Conf room Zone	ON	No Change*	72F Cool 70F Heat	Prohibit On/Off and Setpoint buttons	n/a
	5:00pm	Conf room Zone	OFF	No Change*	No Change for setback*	Prohibit On/Off and Setpoint buttons	No
	5:00pm	Office Zone	OFF	No Change*	65F Setup 85F Setback	No Change*	Yes
Weekend	6:00am	Office Zone	OFF	No Change*	65F Setup 85F Setback	No Change*	Yes
	8:00am	Conf room Zone	OFF	No Change*	No Change for setback *	Prohibit On/Off and Setpoint buttons	No
Holiday (Exception day)	6:00am	Office Zone	OFF	No Change*	65F Setup 85F Setback	Prohibit On/Off	No
	8:00am	Conf room Zone	OFF	No Change*	No Change for setback *	Prohibit On/Off and Setpoint buttons	No

(\*) No change – use the latest setting in the indoor unit group

Figure 12 – Schedule Example

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## Timed Override

When enabled by schedule, the Timed Override feature will turn off indoor units which have been turned on manually during the scheduled unoccupied period after a two hour delay. This feature is useful for allowing the indoor units to energize and maintain temperature control for users that occupy the space during unoccupied times without having to modify the schedule.

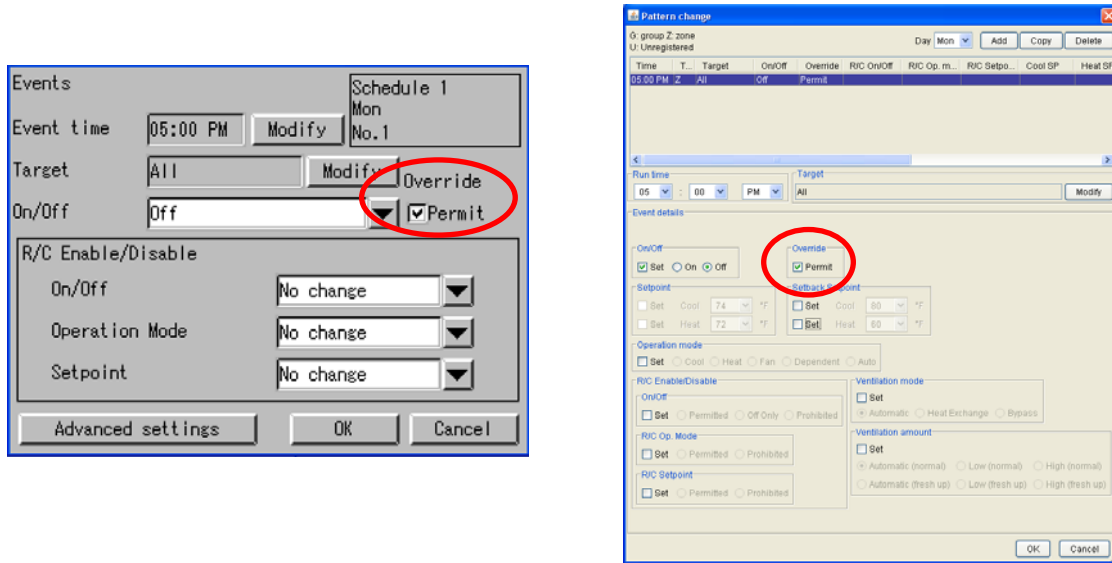


Figure 13 – Timed override Configuration (ITC & Web Option)

## ITC Model Numbers

Item	Model
Intelligent Touch Controller	DCS601C71
DIII-Net Plus Adapter	DCS601A72
Web/E-mail Option for Web access and Alarm E-mail	DCS004A71
HTTP Option for Crestron Integration	DCS007A51
PPD (Power Proportional Distribution) Option	DCS002A71

## Software and Technical Documentation

ITC version 6.02 software upgrade, Installation and Operation Manual, Web Operation Manual, Engineering Guide, Commissioning Guide, Backup tool (Pre-set tool) are available through the Daikin AC Controls Engineering FTP site located at:

<ftp://ftp.daikinac.com/Controls%20DACA/I-Touch/ITC%20v6/>

Username and password for login will be informed by the Daikin AC Service Helpdesk to customers certified for ITC commissioning.

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## Notes

- 1) When the ITC V6 is used in conjunction with a Daikin BACnet® or LON® Interface, the ITC V6 setpoint differential should be set to 0\* (Single Setpoint Mode, refer to page 4 for details) to prevent undesired operation. This is to prevent the ITC V6 algorithm which maintains independent setpoints from conflicting with setpoints written through the interface as heating and cooling setpoints through the interface cannot be independently written. When the ITC V6 is used for Crestron integration, the same setting should be required.
- 2) ITC version 6.02 fixes the version 6.00 issue which turned off some indoor units in two hours automatically.
- 3) Auto Mode built into the indoor unit for Heat Recovery systems will no longer be available. Once the ITC V6 detects the indoor unit in Auto Mode, it will automatically override the unit into Cool or Heat Mode accordingly.
- 4) When upgrading a site from ITC version 4.XX to 6.02, all zones need to be deleted and recreated in version 6.02 or zone functions such as Auto-changeover, Setback, and Setpoint Range Limit might not work properly. Please see the ITC Version 6.02 Engineering Guide for more details or contact Daikin AC Tech Support for more information.

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