

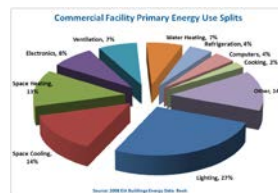
Office Of The Future



- You won't see the old-fashioned thermostat or sensors on the wall.
- The offices of the future will save billions of dollars a year in energy while improving HVAC and lighting comfort.
- Cloud-based computing, analytical software, data harvesting, wireless sensors and controls working together for intelligent buildings.
- Every office desk or individual workstation desk will monitor temperature, motion and light level.
- Each office desk and workstation will monitor the cost of HVAC, lighting and plug load while occupied and unoccupied for their area.
- Temperature setpoints will be averaged, to control the HVAC. If you're the only one occupying your desk in your zone then you are in complete control.
- The low cost of wireless sensors/controls will provide the cost justified improvements that will fuel the \$75-\$50 billion savings a year in our commercial office industry.
- Voice activated control of temperature, lighting or automated window drapes right at your desk.



- Fighting over the thermostat settings will no longer be a problem.
- Wireless sensors and zone controls will not require batteries.
- Offices now days are only occupied on an average of 50% during the normal working hours in the future the average will be higher.
- Mechanical equipment will be monitored with inexpensive wireless sensors allowing the managers and owners to know the operating cost in BTUs for chillers and boiler's. Including costs of pumps, fans etc.
- Building operators and engineers will be able to make energy adjustments and realize their success or failure in actual dollars amounts.
- Owners will know the cost per square foot of HVAC, lighting and plug loads at any given time.
- Analytical software predictive alarms and diagnostics will be enhanced by inexpensive wireless sensors monitoring amperage of mechanical equipment.
- Decisions to upgrade equipment and return on investments will not be guesswork.

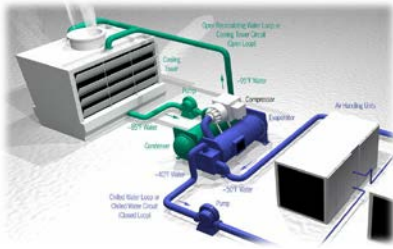


Office of the future Energy Savings

Plug loads

Savings from monitoring the plug loads will come from individuals being held accountable and making a concerned effort to turn things off when, not required or prior to leaving.

Majority of plug load savings will come from accountability, minimal of savings will come from automatic switching from occupancy sensing.



HVAC

The desk sensor system will learn the occupancy tendencies and automatically create a schedule or update existing schedules. Eliminating the need to manually create an occupancy schedule.

The HVAC zone will turn off when all the desks in the zone are unoccupied.

The ultimate savings is obtained when each air outlet diffuser is controlled by an automatic damper and will turn off when individual desks are unoccupied or from individual temperature settings.

The HVAC associated with your office or work area will be monitored while occupied and unoccupied providing HVAC cost at any time. Accountability will provide additional incentive to save.

Remotely turn off your air outlet diffuser if you're not coming in the office. This eliminates the expense of morning warming up.

Lighting

Individual lights or all office lights in your office or desk workstation area will turn off when not required or unoccupied. Bright overhead lights are not required when you're working on your computer.





Office of the future Comfort

Your HVAC system will learn the time it takes to heat or cool your desk area to your occupied temperature settings making sure you're comfortable with a minimum amount of prior operating time and cost.

Voice activated settings, "wizard I will return in one hour" your desk sensor will have your office temperature back to normal temperature just prior to your return.

You will be able to use cell phone to warm up your area if coming in earlier or after hours.

Your lighting comfort will be controlled to a light level setting or manually adjusted via your cell phone, computer or voice activated.

Automatic air volume control at each desk location. (Wireless automatic dampers will be less expensive.)

Note: Desk sensor occupancy will determine if the HVAC damper is a cost justified solution for improved comfort and energy savings.



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Office of the future Communications

Following information will be provided to the occupant, manager, owner etc. via text or emails.

The desk sensor system will notify manager or owner of the energy savings that can be achieved.

Notifications of energy saving upgrades: Desk sensor #24 average occupancy during normal working hours is 41% this will provide a one-year ROI by providing wireless automatic damper. This damper will automatically shut off to the unoccupied temperature settings. Your desk sensor will control the damper to meet your comfort requirements while occupied.

ecDesk sensor #3 average occupancy during normal working hours is 20%. Wireless light source switch will provide 1.2 ROI.

Managers will have less unproductive phone calls, e-mails, tension and temper tantrums.

The occupants will receive messages: Your incoming air temperature (supply air) is not at the appropriate temperature to meet comfort settings. Notifications have been sent for repairs. Resetting your comfort temperatures will not resolve your discomfort. Your setpoints are locked at default until the problem is resolved.

The main HVAC system will be off for maintenance repairs between these times 12:00 pm to 2:00 pm your temperature adjustments will be locked in the default settings until the repairs are completed. Setting it higher or lower will not improve your comfort.

Owners etc. will note individual costs at each desk location; ecDesk sensor #3 average lighting costs/day for occupied periods is \$???? Average lighting costs/day for unoccupied periods is \$????

ecDesk sensor #3 average plug load costs/day for occupied periods is \$???? Average plug load costs/day for unoccupied periods is \$????

ecDesk sensor #3 average HVAC costs/day for occupied periods is \$???? Average HVAC costs/day for unoccupied periods is \$????

Owners and managers will be alerted when the cost of producing BTUs increases indicating potential equipment problems in the main mechanical rooms or simple HVAC units.



This is one of a series of articles written by the old pro.

They say I'm a visionary, but to me it's just simple logical solutions, with the low price of wireless sensors and controls **the future is now.**



If unoccupied, turned it off!

Please see my website and let me hear your comments about the wireless sensors and controls that we hope will be available by the end of the year.

Sincerely,

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