Integrated control of
Light, Solar Shading and HVAC
in *Low Energy* Buildings
Anders Hall
Business Development Mgr Projects
Somfy Nordic

Secretary of the Board and
Chairman of the Marketing Committee
European Solar Shading Organisation, ES-SO
Buildings
Intergration of control

- A lot of functions need to be integrated
- But controlled separately
- Experience prooves
- Master – Slave solutions in correct priority
- From the outside in and based on precence and own sensors
  - Solar Shading according to present weather/light condition
  - Light to compensate when Solar Shading is active
  - Ventilation to support when temp is high or low
Integration of control
Integration of function

Lund University, Sweden 2007

On a yearly basis ~ 35% savings
Let us look at two good examples and how they solved it by using this technical approach
This project is one of the most energy efficient office buildings in Sweden.

240 Windsecure External Blinds + Somfy animeo IB+ (stand alone) control system

An extensive follow-up on the comparison between planned consumption and actual.

Max allowed electrical BUILDING consumption for new buildings 2010 was 100 kWh/sqm.
Target

- GREEN BUILDING
- 75 kWh/m² och år
- CLASS "GOLD"
Planning

- Planning based on values like
  - Holistic approach
  - True engagement by all parties
  - New ideas
  - Competence
Ventilation

- Air distribution is controlled 100% via local need at any given point
- Air vents equipped with presence and temp sensors
- Continuously managed flow levels
- Cooling via air distribution
- Room temp allowed to vary in a wider range than normal
  - Not against a fixed temp
Light system controlled by local needs at any given time
- Light fixtures equipped with presence detectors and Lux meters
- Presence detectors control 50% of all wall sockets
- Amount of artificial light managed according to natural daylight
Solar Shadings

- Outside external Venetian Blinds
- Suntracking control during the year
- DOWN during night at minus degrees (adding U value)
- UP if the building is empty and cold outside
Results per year

- Heat / Hot water: 26 kWh/m²
- Regained heat: (-)9 kWh/m²
- Cooling: 11 kWh/m² och år
- Pumps, Fans etc: 24 kWh/m² och år
- Total energy consumption: 52 kWh/m² och år
- Daily running consumption: 30 kWh/m² och år
- Total energy use: 82 kWh/m² och år
Project DOCKUMS, Malmö, Sweden

- 200 Outside Blinds
- Integrated behind the Brick Wall
- Suntracking
- Local control during daytime
- Somfy control system with remote access
<table>
<thead>
<tr>
<th>Key functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilation system</td>
</tr>
<tr>
<td>Rotating heat exchanger</td>
</tr>
<tr>
<td>Precence detection controlling</td>
</tr>
<tr>
<td>CO² detection as complement</td>
</tr>
</tbody>
</table>

The airflow is used to distribute the cooling!
Results

Building regulation 2011 max 90 kWh/m²

Actual

- Heating 28,19 kWh/m²
- Consumption 18,69 kWh/m²
- Hot water 1,00 kWh/m²
- Cooling 7,00 kWh/m²

54,88 kWh/m²;

27% under demands for GreenBuilding
Conclusion from both projects

In both Buildings it has been recognized that the automated Solar Shading system has given significant contributions to the positive results!

Important to involve all stakeholders very early in the planning

Dare to use new techniques and ideas

Take great care in the choice of Glass quality. When combined with Solar Shading the wrong choice can act against you!

The Solar Shading has to be automated. Manual solutions will not bring energy savings
More information...
Thank you for the attention!