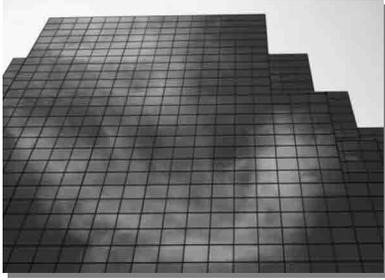


Resolution Master Building Control System

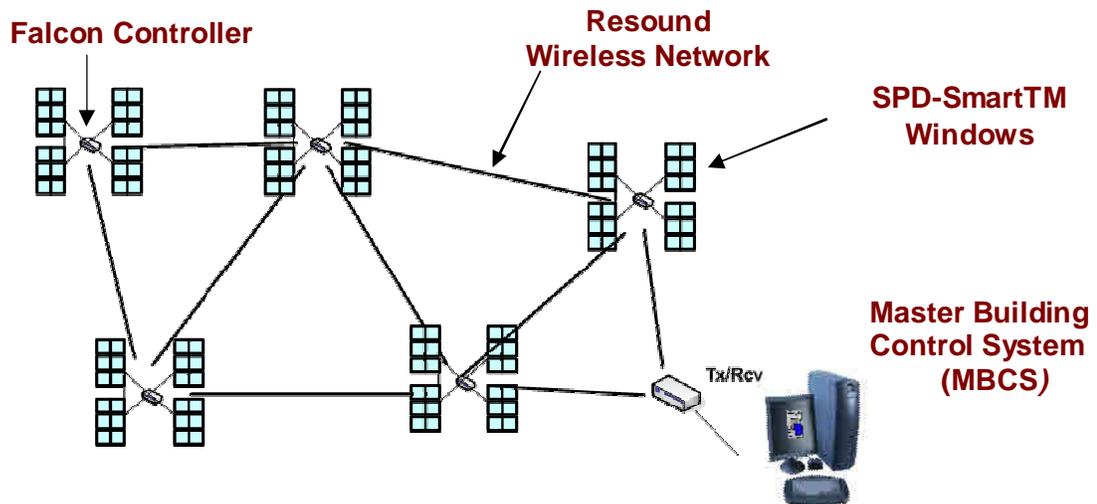


Resolution

SPD Window Master Building Control System (MBCS)

Resolution by SPD Control Systems Corporation (SCSC) is a central building control system for controlling large numbers of SPD Smart Glass Windows. **Resolution** connects to the **Resound** Wireless Mesh Network that communicates to **Revolution Falcon** series SPD window controllers. The system components consist of:

- **Resolution Falcon Controller** SPD Windows Controller
- **Resound Wireless Network** Wireless Mesh Network
- **Resolution MBCS** Master Building SPD Windows Control System



Resolution Master Building Control System

Master Building Control System (MBCS) is the “brains” of any intelligently controlled set of smart windows and it is offered to support multiple configurations: from small installations in residential homes to large scale high-rises. A basic MBCS might only use the input from remote photocells along a common face of a structure to determine which windows should be set to what level of transparency on a continual basis. It incorporates date/time information, geographic location and the current position of the sun across the sky relative to the orientation of each window to determine the optimal tint setting for the time of the year.

The MBCS also maintains configuration information, collects statistical data, monitors operations, reports glass breakage messages that are sent from individual controllers, helps determine if portions of the wireless network aren't communicating in a way that requires the placement of transceivers to get around dead spots, maintains and executes customized “glare” programs to address glare issues during specific dates and times, among many other functions. The MBCS supports multiple operating consoles and report printers to support its operations.

Features

- Automatic building window control based on a wide range of parameters and sensors to:
 - Maximize energy conservation
 - Daylighting (maximize natural light to minimize internal lighting)
 - Glare reduction and control
- Autonomous intelligent window tinting control based upon solar conditions and façade modeling (taking shadows into account)
- Synchronized window tint changes (all windows capable of changing at the same time)
- Automatic flicker prevention (avoids windows changing too frequently)
- Control the ability to manually override automatic controls on a window by window basis
- Control the extent of manual overrides: min. and max. window tint
- Update window controllers with new firmware and control parameters individually or at the same time.
- MBCS operator can override automatic settings for specific sets of windows
- Animated graphic displays using each window as a pixel
- Interfaces with third party Building Control Systems
- Interfaces with security systems
- Comprehensive window and system diagnostics, maintenance services, and reports
- Redundant servers (optional) for reliability and availability
- Interface and coordinate with other building control systems (such as HVAC) via a TCP/IP or serial XML-based protocol
- User control of the MBCS can be done:
 - Locally
 - Via the Building LAN or
 - Via the Internet for remote monitoring

Resolution Master Building Control System

Power

| | |
|----|-------------------------------|
| AC | 120 VAC 60 Hz 220VAC 50 Hz |
|----|-------------------------------|

Remote Systems Connectivity

| | |
|------------------------------|-----------------|
| <i>Wireless Mesh Network</i> | RF-based |
| <i>Wired LAN</i> | RJ45 (Ethernet) |

Remote Systems Interfaces

| | |
|------------------------------------|---|
| <i>Building Automation Systems</i> | Other manufactures building control systems |
| <i>Security Systems</i> | To security firms to report window breakage |

Server Characteristics

| | |
|---|--|
| <i>Standard PC Servers</i> | Standalone, desktop or rack mounted |
| <i>Fault Tolerant Configuration</i> | <i>Redundant server components</i> |
| <i>Color Laser Printer</i> | <i>For report generation and logging</i> |
| <i>LCD Monitor</i> | <i>For realtime graphic display of window status</i> |
| <i>Other standard Server components</i> | |

Sensors

The MBCS tracks and logs the following parameters for all the windows under its control:

- *External Temperature*
- *Light Intensity*
- *Solar Transit*
- *Window Breakage*

Services

| | |
|--|--|
| <i>Automatic building window control</i> | Window tinting control based upon solar conditions and façade modeling |
| <i>Synchronized window tint changes</i> | All windows capable of changing at the same time |
| <i>Automatic flicker prevention</i> | Avoids windows changing too frequently (built in hysteresis) |

Resolution Master Building Control System

Override automatic controls

On a window-by-window basis

Control manual overrides

Set min. and max. window tint values

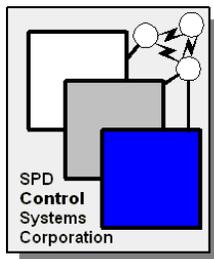
Maintenance services

Diagnostics, maintenance services, alerts, and reports. Alerts include

- Non-communication with controller
- Window breakage alerts
- Signal strength alerts
- Low emergency back-up battery alerts
- Low voltage alerts
-

Status / Statistics Reporting

Displays and report status of the window by individual windows, groups, floors, offices, etc. Keeps history of status information for statistics reporting.



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