Architectural Controllers

SCSC Intelligent Controllers can be installed in any commercial or residential environment for the control of SPD-Smart™ window glass or plastic. This flexible, highly configurable, customizable, feature rich series of electronic controllers and remote operating devices brings SPD windows to life and integrates them with other home and office systems. Use in homes, board rooms, atriums, conference rooms, glasswalls, building façades, classrooms, etc. Allows for the control of single or multiple smart windows by several different methods:

- Wireless handheld remote operations
- Wall switch operations using buttons, dimmers, presets or touch screens
- Home and Office Automation Systems
- Portable wireless touch screens
- Hardwired or networked Personal Computers

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Revolution by SPD Control Systems Corporation (SCSC) is a series of electronic controllers designed to control SPD-Smart^{TM} windows. The ***TintMaker/Architectural*** series of electronic controllers is designed to control SPD-Smart^{TM} windows in residential, commercial buildings and other projects where there are a large number of SPD-Smart^{TM} windows (e.g. atrium). The ***TintMaker/Architectural*** controller can be used as a standalone controller for up to 32 windows or in a wireless network of controllers supporting hundreds or thousands of SPD-Smart^{TM} windows operating autonomously in a coordinated fashion from a central control system.

The ***TintMaker/Architectural*** controller is a small footprint controller with integrated RF wireless networking that can be built into window frames, or mounted in an in-wall enclosure. The wireless network and the controllers can be automatically controlled by a Master Building Control System (MBCS)**.** The MBCS provides the means to control the window façade of an entire building for *maximum energy efficiency* without additional wiring.

> Note: The TintMaker/Architectural controller, wireless network, and
> MBCS can be easily customized to satisfy special projects.

The SCSC subsystems comprising a building automation system for SPD-Smart™ windows are,

- **TintMaker/Architectural Controller**   SPD-Smart™ Windows Controller
- **Resound Wireless Network**   Wireless Mesh Network
- **Resolution MBCS**   Master Building Control System for
                        SPD-Smart™ Windows
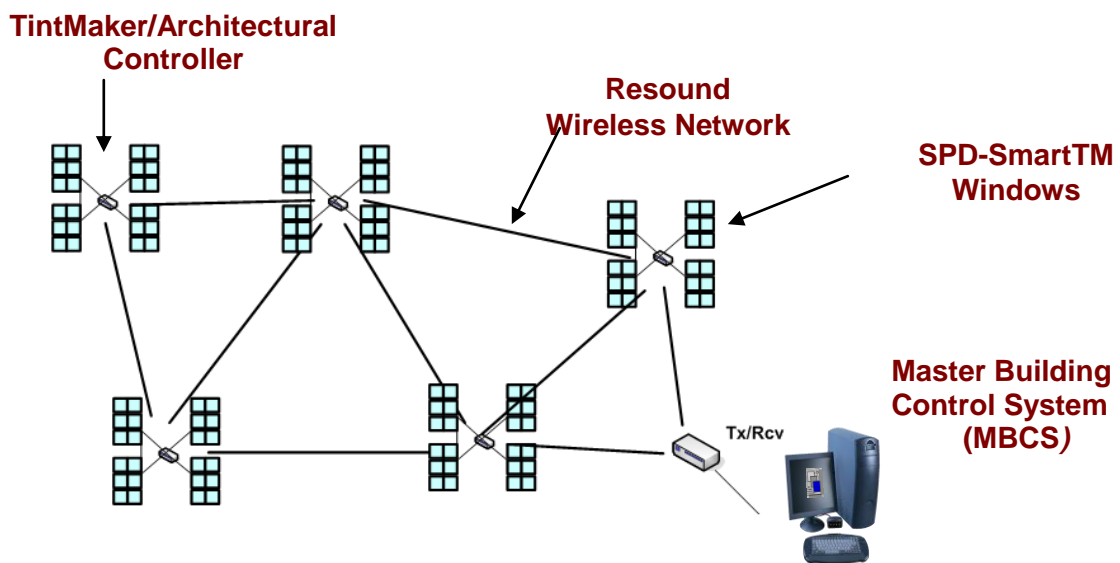
Features
- Three enclosures: in-Window, in-wall or standalone enclosure
- Models for specific projects: residential, commercial, atrium, etc.
- Multilingual operation
- Two RF-based Wireless handhelds:
  - "Einstein" model for configurability and remote operations
  - "Tesla" model for remote operations only
- Autonomous intelligent window tinting control based upon solar conditions
- Timed parameters – synchronized changes
- Full range of power options including battery-only operation
- Customizable for a wide-range of special projects
- Integrates with SCSC's Master Building Control System (MBCS) via our wireless mesh network for centrally controlled automatic operation
- Interfaces to remote dimmers, touch panels, preset light switches and other accessories
- Interfaces to home and office automation systems

- Automatic mode for seasonal time of day settings
- Sensors and alarms for glass breakage
- Optional temperature and photo sensors
- Battery backup for power failure operations
- PC compatible interface available
- Ethernet network support with TCP/IP
- RS-232 support

Capacity

Maximum number of film segments	32	A single piece of glass may consist of multiple film segments
Maximum types of SPD film	1	Single manufacturers Electro-optical profile supported
Maximum size film	Depends on Model Selected	Multiple segments of film per window supported
Maximum distance to windows	TBA	To Be Announced
Wire Grade from controller to window	TBA	Recommended gauge of wire carrying control signals to windows
Maximum wattage output	Depends on Model Selected	Estimated that Gen 2 film will require less than 6 Watts/hour per 100 sq. ft.

Power

AC	120 VAC 60 Hz, 100 VAC 50 HZ, 220VAC 50 Hz	
DC	12, 24, and 48 vDC	
Battery	TBA	Solar cells used to recharge battery
Consumption	TBA	Depends on electrical Characteristics of Gen 2 film
Backup Battery Operation	Min. of 24 hours	Rechargeable Battery

TintMaker

Controller Parameters   Requires SCSC LCD RF-based Remote
                                               Control Unit or a Master Building Control
                                               System (MBCS) to configure controllers

Controller ID   *Select Controller ID* - multiple controllers are
                                               supported from handheld units
Film Windows Parameters   *Configure:*
                                                   SMIN – SPD Film Master Identification
                                                       Number (Film Manufacturer code)
                                                   Film segments/window relationship -
                                                       Segments operate together within
                                                       window
                                                   Zone – a set of windows that are operated as
                                                       if they are a single window
                                                   Name of Windows – Optional Zone name
                                                       (Conference Room A, Board Room)
Date/Time/Day of the Week   Set the current date, time and day of the week
Backup Battery   Auto mode or fixed tint level during power
                                               failure
RF Frequency   908.42MHz, 868.42MHz, country dependent
Language   The LCD Remote Operations Unit initially
                                               supports English. Later versions will support
                                               Italian, Japanese, Russian, French, Korean and
                                               Spanish.
IP Address/Mask/Gateway   DHCP or fixed TCP/IP address supported
                                               (alternate wired network support)

Handheld RF Remote Unit Operations
Adjust Tint   Overrides automatic setting for a single time
                                               period.
Hold   Overrides automatic settings with the current
                                               setting indefinitely.
Select Zone   Select set of windows to control
Select Controller   Handheld talks to selected controller
Display Controller Status   Component status is displayed
Set Controller Parameters   Only available on the LCD based handheld unit

Other Remote Devices
Remote switches, touch pads,   *See Remote Devices Accessory Brochure*
Dimmers, preset button pads,
(wall mounted and standalone)

TintMaker

Remote Systems Connectivity

Wireless Mesh Network	RF-based, spread spectrum frequency hopping for reliability and reduced data transmission interference
Wired LAN	RJ45 (to download updated firmware, update electro-optical tables, set system configuration, and/or operate windows and zones – alternate to RF mesh network)
RS 232	DB9 connector (PC and Crestron compatible interface for windows/zone control)
Handheld/Controller Communications	RF-based
RF Range to Controller	Virtually unlimited as signals hop from controller to controller to reach destination

Physical Characteristics

a) In-Window enclosure	1" (W) x 1" (D) x 0.5" (H) 2.54cm (W) x 2.54cm (D) x 1.27cm *(H)*
b) Dual Gang Box with cover plate	3.75" (W) x 2.75" (D) x 2.75" (H) 9.52cm (W) x 6.98cm (D) x 6.98cm *(H)*
c) Stand-along Enclosure	4" (W) x 2" (D) x 2" (H) 10.16cm (W) x 2.08cm (D) x 2.08cm *(H)*
Weight (Gang Box & Enclosure)	.5 lb 0.227 kg
Temperature Range	
Gang Box & Enclosure	Standard range for indoor electronics
In-Window Enclosure	TBA
Shock Prevention *And Window breakage Detection*	Window breakage or short circuits are detected causing the power to the window to be shut down. An alarm LED is set and an alarm condition is latched. Message is sent to the MBCS.

Front   (Gang Box & Enclosure)

Green LED

On	Power On
Off	Power Off
Flashing	Backup battery mode

Yellow LED

Flashing	Communication Active

Red LED

On	Major error state
Slow Flashing	Self-diagnostic error
Fast Flashing	Short to ground detected

TintMaker

Gang Box Front	RJ45 Connector	Ethernet
	DB-9 Connector	RS-232
Enclosure Back	RJ45 Connector	Ethernet
	DB-9 Connector	RS-232
	32 pairs	SPD Film connectors
	Power Connector	
	Fuse	
	On/Off Button	
In-Window Enclosure	Only interface is RF Wireless Mesh Network	
	Wiring to windows is TBA	
Approvals	UL, CE, FCC part 15, R&TTE 1999/5/EC, plus others	

TintMaker/Architectural Controller Connectivity
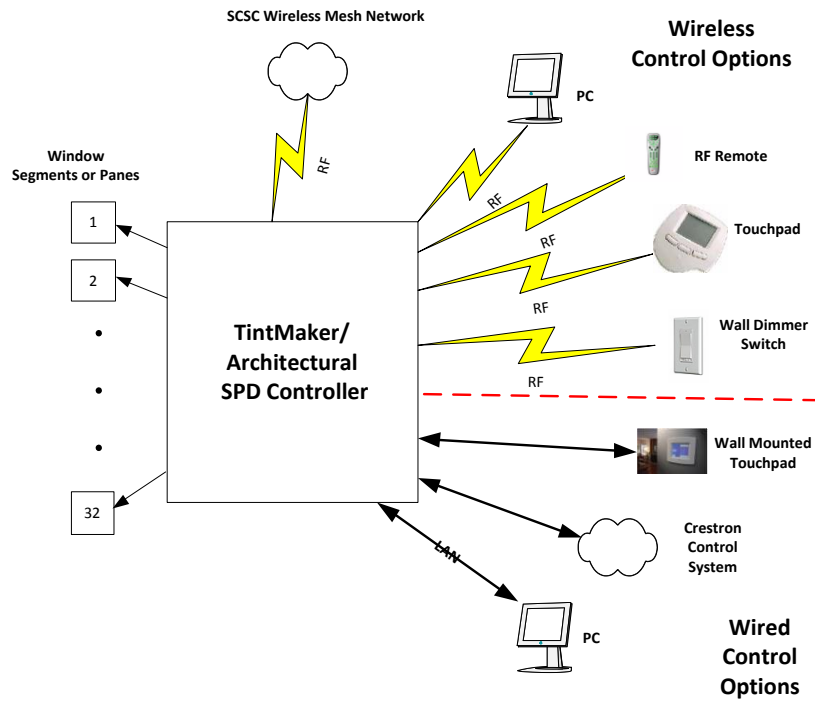
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