

Automotive After-Market Controllers

SCSC Intelligent Automotive Controllers are targeted for the automotive industry but are easily adapted for avionic and marine environments to control SPD glass or plastic windows. This flexible, highly configurable, customizable, feature rich series of electronic controllers bring SPD windows to life and easily integrate with other control systems. Used in cars, aircraft, boats and other custom applications, the controller operates single or multiple SPD windows by several different methods:

- Manual operations via dimmers and solid-state slide switches
- Automatic control through coordination with on-board systems
- Self regulated control via sensors



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Tintmaker SPD Smart Glass Controllers Automotive Series

The **TintMaker Controllers** by SPD Control Systems Corporation (SCSC) are standardized stand-alone electronic controllers designed to operate automotive after-market SPD Smart Glass windows. The controllers provide a comprehensive set of options for connectivity. Note: The automotive controller is easily customized to our client's exact needs.

Versions

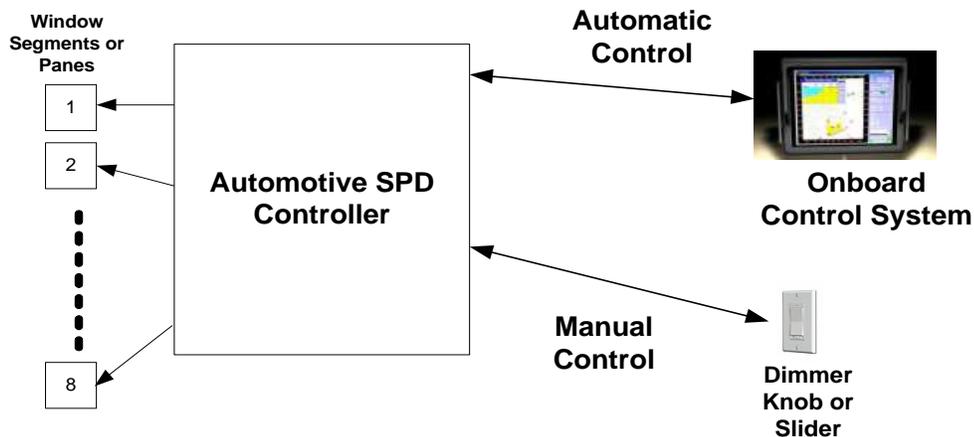
- 1-window
- 8-window

Features

- Small footprint circuit board controller or control module
- Interfaces to standard automotive control systems
- Manual control via support of an array of input devices
- Automatic control via photocell light sensor, rain sensors and others
- Automatic mode for seasonal and time of day settings (future optional)
- Battery backup for power fail operations (future optional)
- Customizable for a wide-range of special projects
- Configurable setting for SPD state when vehicle is turned off (future optional)



Automotive Controller Connectivity



Images of the 8-Window Automotive Controller

Automotive Controller Demo Setup at the RFI 2008 Annual Meeting



View video – www.spdControlSystems.com/AutoDemo.htm



Specifications

	1-Window	8-Window	Comment
General			
Microprocessor	Freescale HCS12 Family		
Software Environment	Proprietary Real-time Scheduler		
Customizable Software Applications	yes		
Customizable Hardware	yes		
Power-up Diagnostics	yes		
Status Check/Diagnostic Command Set	yes		

Film Characteristics			
Normalize Tint Level	yes		Supports all SPD film types / characteristics. Provides linear opaque control of SPD film regardless its electrical non-linearity.
Max. Number of Windows	1	8	
Max. Number of SPD Film Segments	2	16	A single piece of glass may consist of multiple film segments.
Max. Size Film for Each Window	16 sq. ft (1.2 M ²)		
Output Voltage	30 – 120VAC RMS		
Output Isolation	yes		AC output electrically isolated from the vehicle power source
Maximum Window Output Current	30 mA per window		
SPD Film Frequency	30Hz to 400Hz		60 Hz is used by the controller. There may be film produced requiring a higher frequency and there are special cases where a higher or lower frequency may be desirable
Window Tint Transition Time	1 to 2 seconds for 95% of change		

Power			
DC	12 VDC		Will tolerate short duration power variations between 7.5 and 17 VDC
Max Power Consumption	tbd	48 watts	All 8 windows in the clear state.
Backup power	optional battery		

	1-Window	8-Window	Comment
Communication Bus			
RS-232C	yes		
LIN	optional		Development required
CAN	optional		Development required
Other	Most other comms protocols can be supported		Development required

Safety Features			
Over Current Auto Shutdown	yes		
Ground Fault Auto Shutdown	yes		

Physical Characteristic			
Enclosed controller	Approx. 3" (W) x 3" (D) x 1.25" (H)	8.0" (W) x 5.25" (D) x 1.25" (H)	Dimensions include mounting flanges
	Approx. 7.6 cm (W) x 7.6 cm (D) x 3.2 cm (H)	20.3 cm (W) x 13.3 cm (D) x 3.2 cm (H)	
Weight	1 lb (0.454 Kg.)	1.5 lb (0.68 Kg.)	
Temperature Range	-40C to 120C		
Connectors		4 Switchcraft EN3 right-angle, weather-tight connectors are used for the window output signals, Conec Waterproof connectors are used for the command interface port and the control switch input connector, 1 Switchcraft EN3P8M weather tight connector for the power and serial port connections,	
EMI and ESD	tbd		
Control Switch/Sensor Inputs	2	16	Supports push buttons, variable controls or sensors. A switch / sensor may be assigned to a single window, a group of windows, or all windows.
Enclosure	TBD	Extruded aluminum enclosure with integral mounting flanges	

Automotive Application			
Automotive Location	Normally mounted in the trunk and wires run to each of the windows it controls.	Normally mounted in the trunk and wires run to each of the windows it controls.	