

Window Retrofit Option Attachment Automation

Description

Just about any window attachment that is adjustable can be automated: shades, screens, awnings, shutters, and draperies. Automation includes motors, sensors, controls, and timers. Motors can raise-and-lower, tilt, or both. Both controls and power can be wireless, the former using radio frequency technology and the latter with battery technologies. Today’s window attachment motors (and batteries) are typically concealed and protected in the roller tubes of the attachment and operation of the newer motors is approaching “noiseless.”

Powering motorized window attachments

There are three options for powering motorized attachments: battery (direct current—DC), outlet (DC or alternating current—AC), and inwall (AC). Battery power has the advantage of being wireless and not involving an electrician. Battery power is better suited for smaller or lighter window attachments and even with long-life lithium batteries, periodic replacement is required (rechargeable batteries powered by a small solar photovoltaic panel are becoming available for exterior window attachments).

Outlet power is convenient because it does not require an electrician to power the attachment. In new construction, outlets can be concealed along the margin of the window or more typically up at the top of the window behind a valence or the head cassette of the attachment. “Fishing” of lighter gauge DC wiring is generally easier than larger gauge AC wiring. DC motors (low voltage) require a transformer to step down and convert the AC house current. In general, DC motors are better suited to low to medium lift requirements.

Inwall power is AC house wiring direct to the motorized window attachment. Inwall power is best accomplished when wall cavities are open, during construction or major renovation. AC motors are well-suited to heavy lifting and motors servicing multiple window attachments.

Controlling motorized window attachments

Controls for motorized attachments can be for individual or grouped attachments, or both. Controls can be handheld radio frequency and battery powered, they can be integrated with home automation systems, and can be set up for light intensity/temperature activation or programmable operation (either handheld or a wall-mounted control panel).

Wind sensors can be included in exterior window attachment systems to automatically retract when winds threaten deployed retractable exterior attachments.

Finally, manufacturers of window attachment automation systems give detailed guidance on all the options and specifications for motors, power sources, and controls based on the type and size of window attachments.



Motorized awnings with retractable arms that permit the shade to fully deploy at a 160 degree angle.

Photo: Nulmage Robusta Awning by Futureguard, Auburn ME

Overall Thermal Performance

Each adjustable window attachment’s thermal performance can be improved by optimal operation. Several studies (see References) have shown significant improvement in both the thermal performance of adjustable window attachment operation and reduced lighting energy consumption when automation is employed. Savings can be achieved from both remote handheld user operation of motorized attachments as well as automated operation employing sensor-activated window attachments.

When To Consider

- Need optimal operation during absences
- Operation needed for out-of-reach window attachments
- Need to eliminate cords (pets, children)
- Universal design

Appropriate/best-suited contexts:

- Changeable conditions/climates
- Other?

When to consider this retrofit—Ownership

x	Homeowner
	Apartment Renter - Long Term
	Apartment Renter - Short Term
x	Live in a Condo*
x	Live in a Historical District*

* Condominium regulations or historic building codes may require the use of higher VT and lower reflectance window films that maintain appearance from the outside.



New tubular motors fit inside the axle tube around which the shades or awning are wrapped. These tubular motors are quite powerful, very quiet, and durable. Tubular motors are capable of as much as 200 pounds of lift!

Photo: Nulmage Robusta Awning by Futureguard, Auburn ME

Recommended Installer

?	Do it Yourself
?	Contractor
x	Manufacturer or supplier

Complementary Options

- Roller shades
- Cellular shades
- Awnings
- Blinds (wood blinds?)
- Draperies

Operation

Various degrees of automated operation and control

Considerations

	1	2	3	4	5
Ease of Installation (1 = easier)	x (battery)			x	x
Availability (1 = more available)			x	x	
Cost (1 = lower cost)					
Average Total Cost for 30- by 60-inch window					
Motorization- Remote Control	\$? (dependent on shade type, size, fabric, and motor selection)				
Home automation systems (integrated)	\$50 - \$1,000				

When to consider this retrofit—Window conditions

x	Existing window single-glazed
x	Existing window double-glazed, no low-e*
x	Existing window double-glazed with low-e

* low-emissivity coating

Key Benefits

- Ease of operation, convenience
- Continued optimal operation during absence (security)
- Safety (no cords)
- Energy savings

Key Drawbacks

- Cost
- Learning curve for programming
- Size limitations
- Not available on all attachment types

Aesthetics

- Clean installation (no cords, hidden motors)

Tips/Cautions

- Batteries must be changed every 12 – 36 months (if battery-powered)
- Particularly for large exterior attachments, wind sensors are a good idea

Digging Deeper

Energy Modeling Tools for Professionals

RESFEN
EnergyPlus-based modeling tools
WINDOW 6
Other:

References

- "reference"*
- "reference"*

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For more information visit: www.windowattachments.org