Hyperion Sequence of Operations: For Quantum v3.1 and later

Clear Form

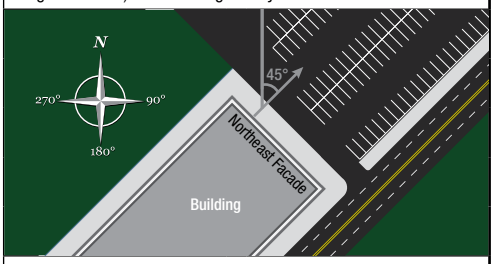
Purpose: This document is a tool intended to capture the functional requirements of Hyperion. The questions below will streamline the specification process, document the values and specific feature set required for this project, and ultimately ensure that the system is programmed and tested to the design intent.

A Site Information

Project:	Project Name	Project Number	Date
Location:	City / State / Country	Time Zone	

Building:	FAÇADE WITH SHADES (NAME)	ANGLE TO TRUE NORTH*
1.		°
2.		°
3.		°
4.		°
5.		°
6.		°

*Building facade angles are in reference to True North (not magnetic North). The building surveyor will have this information.



Example: The view from (a line perpendicular to the wall of) the "Northeast" façade is at a 45° angle to True North.

IMPORTANT: DO NOT use a smartphone to determine the façade angle. For in-depth façade angle measurement instructions and tools, see Hyperion Façade Angle Tools

B Controllable Shade Information

(To profile more than 16 shades, open another copy of this page)

MEASURED IN: ◉ inches ○ cm

Clear Measurements

	Location	Shade Type	Hyperion™ Controlled*	Work Surface Height[1]	Max, Sunlight Penetration[2]	Shade-Closed Height[3]	Shade-Open Height[4]
1.			☐	in ☐ Make Default	in ☐ Make Default	in ☐ Make Default	in ☐ Make Default
2.			☐				
3.			☐				
4.			☐				
5.			☐				
6.			☐				
7.			☐				
8.			☐				
9.			☐				
10.			☐				
11.			☐				
12.			☐				
13.			☐				
14.			☐				
15.			☐				
16.			☐				

*Typically, only the sunscreen shades are controlled by Hyperion™. Other Sivoia® QS shades are controlled by the Quantum® system, or by manual controls.

[1] Distance from the floor to the primary desktop or work surface Help

[2] Distance (from the window) sunlight should come into the space at Work Surface Height Help

[3] Distance from the floor to the shade's hem bar when the shade is in the fully lowered position Help

[4] Distance from the floor to the shade's hem bar when the shade is in the fully raised position Help

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C Sequence of Operation

1. **Positioning Method:** Throughout the day the sunscreen shades will automatically move to new calculated positions that maximize natural light in the space and eliminate direct sunlight (glare).

   Set the Positioning Method:

   ◉ Continuous (default)
   A shade can stop anywhere within the height of the window

   OR

   ○ Predefined Presets
   Predefined levels are set to ensure that the shades always line up with horizontal mullions or other aesthetic features

2. **Shade Movement Interval:** Even with ultra-quiet Lutron® window treatments, moving shades can be a visual distraction to occupants. To minimize this distraction, the Hyperion™ solar-adaptive algorithm offers the ability to set the minimum time between shade movements so that each shade group does not move more than once in the chosen time period. The Hyperion™ solar-adaptive algorithm will always move shades as necessary to prevent glare. Shorter minimum times cause the shades to move in smaller steps and maximize light in the space, while longer minimum times cause the shades to move in larger steps with less priority on maximizing light in the space.

   Set the Minimum Shade Movement Interval:

   ◉ 30 minutes (default)
   Shades will move only once in any given 30-minute period

   OR

   ○ User-defined _____ minutes (120 max)
   Shades will move only once in the time period set above

3. **Visor Height:** To eliminate standard bright sky conditions, a visor height (distance from the floor) is programmed. The visor height acts as the highest possible point the shades can achieve (while not in override).

   Set the Visor Height:

   ◉ The horizon line from the occupant's perspective (default)

   OR

   ○ User-defined _____ above the floor

4. **Manual Override Time:** A person may manually override the Hyperion™ solar-adaptive algorithm and adjust the position of a shade group through multiple methods, including local controls, Quantum® Software, or other integration methods. After the manual override time (specified below), the shade group will move to the position calculated by the Hyperion Solar Adaptive Algorithm.

   Manual Override will remain in effect for:

   ◉ 30 minutes (default) **OR** ○ User-defined _____ minutes (300 max) **OR** ○ Until the Hyperion™ solar-adaptive algorithm is disabled at the end of the day

5. **Wake-Up:** The Hyperion™ solar-adaptive algorithm will be turned on and the sunscreen shades will automatically move to a calculated position that maximizes natural light in the space and eliminates direct sunlight (glare).

   Set the Wake-Up Time:

   ◉ Sunrise (default) **OR** ○ Sunrise ± Offset: _____ **OR** ○ Enter a time: _____ : _____

6. **End-of-Day:** The Hyperion™ solar-adaptive algorithm will be turned off.

   Set the Hyperion™ Shut-off Time:

   ◉ Sunset (default) **OR** ○ Sunset ± Offset: _____ **OR** ○ Enter a time: _____ : _____

   When Hyperion™ is shut off, shades will be positioned as set below:
   NOTE: The position that the shades end at will typically determine the position that the shades start at the next day. A scheduled event can also be used at night, after the sun has completely gone down, in order to move the shades after the end of the Hyperion™ solar-adaptive algorithm schedule so that the space has glare protection at twilight, but also has maximum view during the night and early morning.

   ◉ **All shades open (default):** Choose this option if you want the shades to be open the next morning to maximize daylight and views before the Hyperion™ solar-adaptive algorithm starts. Also choose this option if you don't need the shades closed during the evening for privacy or preventing light pollution. **NOTE:** This could leave the possibility for post-sunset glare events

   ○ **All sunscreen shades will close / all blackout shades will remain at their current position.** Choose this option if you need privacy, to prevent light pollution at night, or to increase effective insulation of the windows overnight. Depending on the end of day time, this could limit the occupant's view.

   ○ **All sunscreen shades will close / all blackout shades will open.** Choose this option to maintain a uniform exterior view of the building. Depending on the end of day time, this could limit occupant's view.

   ○ **All shades will remain in their current position.** This will protect from most glare and give the occupants the desired view.

   ○ **All shades will be sent to a preset position.** This option allows the most flexibility for shade positioning.

   50% (default) **OR** User-defined: _____ above the floor

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D Additional Settings for Sensor-Equipped Systems

Do you have Radio Window sensors (Window or Mullion mount)?
NO: All required information was entered in sections A through C. You may skip Section D.
YES: Please complete all of Section D.

NOTE: The default value for all times and delays in Section D is 30 minutes. Generally, if you change one time value, it is recommended you change all of them to match.

7. **Shade Grouping:** Lutron® Hyperion™ solar-adaptive system and Radio Window sensors work together seamlessly to adjust Sivoia® QS shades throughout the day based on both the sun's position as well as exterior conditions. Together they enable the system to maximize occupant comfort as well as natural daylight, available views, and energy savings. The Radio Window sensor is a device that measures foot-candles (fc) at the window and can override the Hyperion™ solar-adaptive algorithm when dark or bright conditions take precedence. Shades on a facade are separated into designated groups determined by control intent and motor position. For facades that see both direct sunlight and shadows, utilizing multiple Radio Window sensors along that facade can help further optimize the performance of its shade groups in response to changing exterior weather conditions. Radio Window sensors along that facade can be configured to override Hyperion™ solar-adaptive control in 3 different ways to either maximize daylight autonomy, hembar alignment, or both.

Choose the shade grouping method:

⦿ Smart Adaptive grouping (default) This setting combines information from all sensors on the facade to dynamically and intelligently group the shades to maximize daylight autonomy and hembar alignment, while minimizing unexpected shade movements.	**OR**	○ Always Aligned grouping This setting combines information from all sensors on the facade to optimize continual shade alignment.

OR

○ Independent grouping This setting causes each shade group on a facade to operate independently according to sensor data and allows for misalignment to maximize daylight autonomy.

8a. **Dark Override:** Enables a building to maximize daylight autonomy and occupant comfort by raising the shades when either a shadow from a neighboring building or a dark cloudy day is blocking sunlight. When the light reading from the Radio Window sensor is below the Dark Override threshold for longer than the Dark Override delay time, it will override Hyperion™ and raise the shades to the Dark Override position.

Enable / Disable Dark Override:

⦿ Enabled (default) ○ Disabled

b. **Dark Override Position:** If the light level at the window is below the Dark Override threshold for longer than the Dark Override delay, the Hyperion ™ solar-adaptive algorithm will be overridden and the shades will be sent to the Dark Override Position.

Set the Dark Override Position:

⦿ 100%, or fully open (default) **OR** ○ User-defined: above the floor

c. **Dark Override Threshold:** Set a light level, measured in foot-candles (fc) by the Radio Window sensor, at which the Dark Override settings will take effect. Increasing this number will allow for more outside views (shades open) but potentially more glare.

Set the Dark Override Threshold:

⦿ 30 fc (default) **OR** ○ User defined (0 through 12,000 fc): fc

d. **Dark Override Delay:** If the light level at the window is below the Dark Override threshold for longer than the Dark Override delay, the Hyperion ™ solar-adaptive algorithm will be overridden and the shades will be sent to the Dark Override Position. The shorter this time, the quicker the override takes place. The longer the time, the more filtering occurs, allowing for passing shadows from buildings or clouds to be prevented from triggering the override. This helps avoid oscillation between normal operation and Dark Override by waiting to see a steady-state light level below the threshold before overriding the Hyperion™ solar-adaptive algorithm.

Set the Dark Override Delay:

⦿ 30 minutes (default) **OR** ○ User defined: minutes (360 max)

e. **Dark Hysteresis:** When the Hyperion™ solar-adaptive algorithm has entered Dark Override, a Dark Hysteresis can be used to set a light level at which automated operation of the Hyperion™ solar-adaptive algorithm will restart (ending Dark Override). Increasing this number will cause Dark Override to last longer, maximizing time with the shades open. Reducing this number will cause automated operation of the Hyperion™ solar-adaptive algorithm to restart sooner, minimizing time in which the light entering the space is above the Dark Override threshold.

Set the Dark Hysteresis:

⦿ 100 fc (default) **OR** ○ User defined (0 through 1,000 fc): fc

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D Additional Settings for Sensor-Equipped Systems (continued)

9a. Bright Override: Ensures occupant comfort by lowering the shades under very bright conditions, such as when a large reflection off a glass building is shining directly into the space. When the light reading from the Radio Window sensor is above the bright-override threshold, it will override the Hyperion™ solar-adaptive algorithm and lower the shades to the bright-override position.

Enable / Disable Bright Override:

- ◉ Enabled (default)
- ○ Disabled

b. Bright Override Position: If the light level at the window is above the Bright Override threshold, the Hyperion ™ solar-adaptive algorithm will be overridden and the shades will be sent to the Bright Override Position.

Set the Bright Override Position:

- ◉ 0%, or fully closed (default) **OR** ○ User-defined: above the floor

c. Bright Override Threshold: Set a light level, measured in foot-candles (fc) by the Radio Window sensor, at which the Bright Override settings will take effect. Increasing this number will allow for more outside views (shades open) but potentially more glare.

Set the Bright Override Threshold:

- ◉ 5,000 fc (default) **OR** ○ User defined (0 through 12,000 fc): fc

d. Hyperion™ Re-enable Delay: The shorter this time, the sooner the shades will exit the Bright Override state and re-enter normal operation. The longer the time, the longer return to normal operation is delayed. This delay helps avoid oscillation between Bright Override and normal operation by waiting to see a steady-state light level below the Bright Override Threshold before returning the shades to normal operation.

Set the Hyperion™ Re-Enable Delay:

- ◉ 30 minutes (default) **OR** ○ User defined: minutes (360 max)

e. Bright Hysteresis: When the Hyperion™ solar-adaptive algorithm has entered Bright Override, a Bright Hysteresis can be used to set a light level at which automated operation of the Hyperion™ solar-adaptive algorithm will restart (ending Bright Override). Increasing this number will require a larger change in light levels to restart Hyperion™ solar-adaptive algorithm automation. Reducing this number will require a smaller change in light levels to restart Hyperion™ solar-adaptive algorithm automation.

Set the Bright Hysteresis:

- ◉ 1000 fc (default) **OR** ○ User defined (0 through 999 fc): fc

IMPORTANT:

At sunrise and at sunset there can be glare conditions even though the overall measured brightness from the Radio Window sensor is low.

- In the morning, the Hyperion™ solar-adaptive algorithm accounts for this by proactively lowering the shades to the Hyperion™ solar-adaptive algorithm position for approximately 15 minutes after sunrise regardless of measured light levels (no overrides will occur).
- In the evening, the system will leave the Hyperion™ solar-adaptive algorithm in its active or overridden state based on what was happening prior to sunset.

Using the override button during either of these time periods will cause the Hyperion™ solar-adaptive algorithm to be disabled for the manual override time specified in Section C, Item 5.