Johnson Controls

Object Library

Door Sequence Object

DOOR SEQUENCE OBJECT

INTRODUCTION

The Door Sequence object provides a mechanism to operate the basic portal-related inputs and outputs.

Depending on the application, the Door Sequence object interacts with a variety of different objects. Figure 1 illustrates basic interactions.

When the Access Control object makes an access decision, it writes to the *Decision Category* attribute of the Door Sequence object. The Door Sequence object then takes the appropriate actions to operate any outputs, and possibly generate notifications.

Also, the Door Sequence object can activate Controller Event objects when it is about to unlock a portal, or after the portal is determined to be locked and closed.
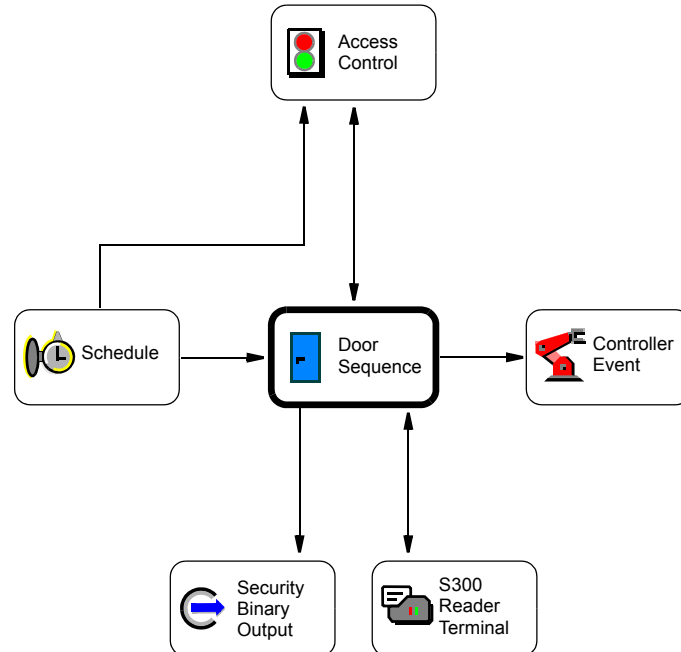

Figure 1: Door Sequence Object

ATTRIBUTES

This section describes visible attributes specific to the Door Sequence object. This object also contains:

- Attributes common to all objects in the P2000 Security Management System. For details, see the *General Object Information* document.

- Internal attributes, which are invisible to the user and cannot be modified directly, but may be referred to throughout this document.

Table 1: Door Sequence Object Attributes

Attribute Name	Attribute Number	Data Type	Notes	Initial Value	Values/Options /Range
Access Attribute[6]	2909	Attribute reference	WCAN	-	See note[1]
Access Time	2268	Unsigned32	WCA	5	In seconds[5] 1 - 1,000,000
Acked Transitions[6]	0	BACnetEvent TransitionBits	-	-	Refer to *BACnet Standard 12.19.19*
Alternate Access Time	2913	Unsigned32	WCA	15	In seconds[5] 1 - 1,000,000
Anti-Tailgating	2917	Enumeration	WCA	-	0 = Disabled 1 = Re-lock on Open[2] 2 = Re-lock on Close
Aux Mode	2918	Enumeration	WCA	1	0 = Disabled[4] 1 = Shunt, Unlock, Green Light 2 = Shunt and Unlock Only[3] 3 = Shunt Only
Auxiliary Input Attribute[6]	2920	Attribute reference	WCAN	-	See note[1]
Event Enable[6]	35	BACnetEvent TransitionBits	CA	1,1,1	Refer to *BACnet Standard 12.19.18*
Event State	36	Enumeration	F	-	0 = Normal 1 = Fault 2 = Off-Normal
Event Time Stamps[6]	130	BACnetARRAY[3] of BACnetTimeStamp	-	-	Refer to *BACnet Standard 12.19.21*

Table 1: Door Sequence Object Attributes

Attribute Name	Attribute Number	Data Type	Notes	Initial Value	Values/Options /Range
Fault Cause	2896	Enumeration	F	-	0 = None 1 = Timed Override Warning 2 = Red Light[1] 3 = Green Light[1] 4 = Shunt Warning 5 = Shunt[1] 6 = Access[1] 7 = Auxiliary Input[4] 8 = Stuck Locked 9 = Stuck Unlocked 10 = Lock Monitor 11 = Portal Contact[4] 12 = Reader Terminal
Green Light Attribute[6]	2911	Attribute reference	WCAN	-	See note[1]
Lock Monitor Attribute[6]	3839	Attribute reference	WCAN	-	-
Lockdown	2905	Boolean	W	-	See note[4]
Lockdown Priority[6]	2922	Unsigned8	WCA	11	3 - 16, see note[4]
Momentary Aux	2919	Boolean	WCA	-	-
Notification Class	17	Unsigned32	WCA	1	Refer to *BACnet Standard 12.19.15*
Notify Priority	3644	Unsigned8	WCA	-	-
Notify Type	72	Enumeration	WCA	-	Refer to *BACnet Standard 12.19.20*
Override	2906	Boolean	W	-	-
Override Priority[6]	2923	Unsigned8	WCA	15	3 - 16
Portal Contact Attribute[6]	2908	Attribute reference	WCAN	-	See note[1]

Table 1: Door Sequence Object Attributes

Attribute Name	Attribute Number	Data Type	Notes	Initial Value	Values/Options /Range
Portal Default	2921	Enumeration	WCA	-	0 = Normal (Access Mode) 1 = Override (Open Mode) 2 = Lockdown (Secure Mode)[4]
Portal Mode	2902	Enumeration	FVWZ	*Portal Default*	0 = Normal (Access Mode) 1 = Override (Open Mode) 2 = Lockdown (Secure Mode)[4]
Portal Mode Priority Array	4703	BACnetARRAY[16] of Enumeration			0 = Normal (Access Mode) 1 = Override (Open Mode) 2 = Lockdown (Secure Mode)[7]
Post-Secure Controller Event List	4270	List of Object Reference	WCAN	-	Max. 100 entries
Present Value	85	Enumeration	F	-	0 = Not initialized 1 = Locked 2 = Locked and Closed 3 = Locked and Open 4 = Unlocked 5 = Unlocked and Closed 6 = Unlocked and Open 7 = Forced Open 8 = Propped Open 9 = Unknown 10 = Fault
Pre-Unlock Controller Event List	4269	List of Object Reference	WCAN	-	Max. 100 entries
Reader Terminal Object	3706	Object reference	WCAN	-	-
Red Light Attribute[6]	2912	Attribute reference	WCAN	-	See note[1]
Release Portal Mode	3705	Boolean	W	-	-

Table 1: Door Sequence Object Attributes

Attribute Name	Attribute Number	Data Type	Notes	Initial Value	Values/Options /Range
Release Suppress	3709	Boolean	W	-	-
Security Level	4036	Unsigned8	WCA	-	0 - 99
Security Mode	3005	Enumeration	WCA	-	0 = Normal (Access Mode) 1 = Override (Open Mode) 2 = Lockdown (Secure Mode)[4]
Security Mode Active Level	3008	Unsigned8	WCA	1	0 - 100
Security Mode Priority	3007	Unsigned8	WCA	10	3 - 16
Shunt Attribute[6]	2910	Attribute reference	WCAN	-	See note[1]
Shunt Time	2269	Unsigned32	WCA	10	In seconds[5] 1 - 1,000,000
Shunt Warning Attribute	2915	Attribute reference	WCAN	-	-
Shunt Warning Time	2914	Unsigned32	WCA	-	In seconds[5] 0 - 1,000,000
Suppress	2933	Boolean	WZV	Suppress Default	-
Suppress Default	4032	Boolean	WCA	-	-
Suppress Forced Door	4064	Boolean	WZV	*Suppress Forced Door Default*	-
Suppress Forced Door Default	4065	Boolean	WCA	-	-
Suppress Propped Door	4067	Boolean	WZV	*Suppress Propped Door Default*	-
Suppress Propped Door Default	4068	Boolean	WCA	-	-
System Override	2907	Boolean	WCA	-	-
System Override Priority[6]	2924	Unsigned8	WCA	9	3 - 16
Timed Override	2281	Unsigned32	W	-	In seconds 0 - 1,000,000

Table 1: Door Sequence Object Attributes

Attribute Name	Attribute Number	Data Type	Notes	Initial Value	Values/Options /Range
Timed Override Mode	2926	Enumeration	WCA	-	0 = Not allowed 1 = Timed Override 2 = Timed Override Anti-Tailgating 3 = Timed Shunt[2]
Timed Override Priority[6]	2925	Unsigned8	WCA	13	3 - 16
Timed Override Warning Attribute	2929	Attribute reference	WCAN	-	-
Timed Override Warning Time	2928	Unsigned32	WCA	-	In seconds 0 - 1,000,000
A - Archive, C - Configurable, F - PMI (Person/Machine Interface) refreshing, N - Value not required, W - Writable, V - Initial value redirected, Z - Priority allowed on write					
[1] Not supported when in reader terminal mode, interfacing to an RDR2 or RDR2S of any revision.					
[2] When in terminal mode, requires an RDR2 Rev E or higher, or RDR2S of any revision.					
[3] When in terminal mode, requires an RDR2S Rev Q or higher.					
[4] When in terminal mode, not supported by the RDR2S.					
[5] When in terminal mode, the RDR2 or RDR2S determines the maximum times. See "Reader Terminal Mode" on page 16.					
[6] See "Advanced Configuration" on page 24					
[7] Not currently supported.					

Access Attribute – Specifies the attribute the Door Sequence object shall use to operate the strike lock. When the Door Sequence object operates in reader terminal mode, this attribute shall be left blank. See "Access Output" on page 28 for details.

Access Time – Specifies the number of seconds the access output shall be activated after a regular access grant. When the Door Sequence object operates in reader terminal mode interfacing to an RDR2, the highest supported value for this attribute is 25 seconds. See "Access Output" on page 28 for details.

Acked Transitions – Conveys three flags that separately indicate the receipt of acknowledgements for To-Offnormal, To-Fault, and To-Normal events. This attribute is provided for compatibility with BACnet intrinsic reporting.

Alternate Access Time – Specifies the number of seconds the access output shall be activated after an alternate access grant. This attribute is not supported when the Door Sequence object operates in reader terminal mode interfacing to an RDR2 Revision D or lower.

Anti-Tailgating – Specifies the mode anti-tailgating shall be performed. This attribute should not be written to "Re-lock on Open" when the Door Sequence object operates in reader terminal mode interfacing to an RDR2 Revision D or lower.

Aux Mode – Specifies the way the auxiliary input shall impact the Door Sequence object's operation. This attribute should not be written to "Disabled" or "Shunt and Unlock Only" when the Door Sequence object operates in reader terminal mode interfacing to an RDR2.

Auxiliary Input Attribute – Specifies the attribute the Door Sequence object shall use as auxiliary input. When the Door Sequence object operates in reader terminal mode, this attribute shall be left blank. See "Lock Monitor Input" on page 27 for details.

Event Enable – Conveys three flags that separately enable and disable reporting of To-Offnormal, To-Fault, and To-Normal events. This attribute is provided for compatibility with BACnet intrinsic reporting.

Event State – Indicates the event-related status of the Door Sequence object, which is determined as follows:

- Fault - The *Present Value* attribute is set to "Fault" or the last To-Fault notification has not yet been acknowledged.

- Off-Normal - The *Present Value* attribute is set to "Forced Open" while the *Suppress Forced Door* attribute is set to "False," or the *Present Value* attribute is set to "Propped Open" while the *Suppress Propped Door* attribute is set to "False," or the last To-Offnormal notification has not yet been acknowledged.

- Normal - All other conditions, including the *Present Value* attribute being "Unknown."

Event Time Stamps – Conveys the times of the last event notifications for To-Offnormal, To-Fault, and To-Normal events. This attribute is provided for compatibility with BACnet intrinsic reporting.

Fault Cause – Indicates the highest priority reason why the *Present Value* attribute is set to "Unknown" or "Fault." In case multiple reasons apply, the value with the higher enumeration value is given. When a referenced attribute cannot be written to, the *Fault Cause* attribute cannot return to "None" until that attribute was successfully written by the Door Sequence object, the attribute reference is cleared, or the controller is rebooted.

The options for the *Fault Cause* attribute are:

- None - The *Present Value* attribute is not set to "Fault."

- Timed Override Warning - The timed override warning output cannot be found or written to.

- Red Light - The red light output cannot be found or written to.

- Green Light - The green light output cannot be found or written to.

- Shunt Warning - The shunt warning output cannot be found or written to.

- Shunt - The shunt output cannot be found or written to.

- Access - The access output cannot be found or written to.

- Auxiliary Input - The auxiliary input object cannot be found, is unreliable, in fault, or unknown.

- Stuck Locked - The lock monitor indicates that the lock is locked when it should be unlocked.

- Stuck Unlocked - The lock monitor indicates that the lock is unlocked when it should be locked.

- Lock Monitor - The lock monitor object cannot be found, is unreliable, in fault, or unknown.

- Portal Contact - The portal contact object cannot be found, is unreliable, in fault, or unknown.

- Reader Terminal - The reader terminal object cannot be found, is unreliable, in fault, or unknown.

Green Light Attribute – Specifies the attribute the Door Sequence object shall use to operate the green light. When the Door Sequence object operates in reader terminal mode, this attribute shall be left blank. See "Green Light Output" on page 30 for details.

Lock Monitor Attribute – Specifies the attribute the Door Sequence object shall use as the lock status input. See "Lock Monitor Input" on page 27 for details.

Lockdown – Specifies whether the *Portal Mode* attribute should be written to the "Lockdown" state at the priority specified in the *Lockdown Priority* attribute. This attribute should not be written to "True" when the Door Sequence object operates in reader terminal mode interfacing to an RDR2. See "Lockdown" on page 23 for details.

Lockdown Priority – Specifies the priority with which writing the *Lockdown* attribute impacts the *Portal Mode* attribute. See "Lockdown" on page 23 for details.

Momentary Aux – Specifies whether auxiliary access shall be triggered on the rising or the falling edge of the auxiliary input. See "Lock Monitor Input" on page 27 for details.

Notification Class – Specifies which Security Notification Class object should be used by the Door Sequence object to send its notifications.

Notify Priority – Specifies the Priority parameter of all notifications generated by the Door Sequence object.

Notify Type – Specifies the Notify Type of the Door Sequence object.

Override – Specifies whether the *Portal Mode* attribute should be written to the "Override" state at the priority specified in the *Override Priority* attribute. See "Override" on page 22 for details.

Override Priority – Specifies the priority with which writing the *Override* attribute impacts the *Portal Mode* attribute. See "Override" on page 22 for details.

Portal Contact Attribute – Specifies the attribute the Door Sequence object shall use as portal contact. When the Door Sequence object operates in reader terminal mode, this attribute shall be left blank. See "Output Objects" on page 27 for details.

Portal Default – Specifies the default value of the *Portal Mode* attribute, and also that attribute's value when all of its priorities are released. This attribute should not be written to "Lockdown" when the Door Sequence object operates in reader terminal mode interfacing to an RDR2. See "Portal Mode Attribute" on page 18 for details.

Portal Mode – Specifies the principal mode of operation for the Door Sequence object. This attribute should not be written to "Lockdown" when the Door Sequence object operates in reader terminal mode interfacing to an RDR2. See "Portal Mode Attribute" on page 18 for details.

Post-Secure Controller Event List – Specifies the Controller Event objects that have their *Activate* attribute written to "True" just after the Door Sequence object's *Present Value* attribute changes to "Locked and Closed."

Present Value – Indicates the principal status of the Door Sequence object. The status can be one of the following:

- Not initialized - The Door Sequence Status has not yet been determined.

- Locked - The strike is locked and the portal contact is not defined.

- Locked and Closed - The strike is locked and the portal contact is closed.

- Locked and Open - The strike is locked and the portal contact is open.

- Unlocked - The strike is unlocked and the portal contact is not defined.

- Unlocked and Closed - The strike is unlocked and the portal contact is closed.

- Unlocked and Open - The strike is unlocked and the portal contact is open.

- Forced Open - The portal contact was opened without the portal being shunted.

- Propped Open - The portal contact is open after the portal was being un-shunted.

- Unknown - The portal contact, auxiliary input, lock monitor or reader terminal object is in the unknown state, and no other fault condition as described in the description of the *Fault Cause* attribute applies. This state indicates an offline hardware module.

- Fault - A referenced attribute is not found, is unreliable, is in a fault state, could not be written, or the lock monitor feature concludes that the lock is stuck. This state indicates an electrical or mechanical malfunction of the field equipment.

Pre-Unlock Controller Event List – Specifies the Controller Event objects that have their *Activate* attribute written to "True" just before the strike is commanded to unlock.

Reader Terminal Object – Specifies the reader terminal object to be used for reader terminal mode. When the Door Sequence object should not operate in reader terminal mode, this attribute shall be left blank. See "Reader Terminal Mode" on page 16 for details.

Red Light Attribute – Specifies the attribute the Door Sequence object shall use to operate the red light. When the Door Sequence object operates in reader terminal mode, this attribute shall be left blank. See "Red Light Output" on page 31 for details.

Release Portal Mode – When written to "True," priorities 3 through 16 of the *Portal Mode* attribute are released, and the *Portal Mode* attribute is set to the value specified in the *Portal Default* attribute. The value of the *Release Portal Mode* attribute always remains "False." It may be necessary to restore the *Portal Mode* attribute to its default state after any configured priorities were changed during a time where features were actively using them.

Release Suppress – When written to "True," priorities 16 through 3 of the *Suppress* attribute are released. The value of the *Release Suppress* attribute always remains "False."

Security Level – Specifies the Door Sequence object's current security level. See "Security Mode" on page 24 for details.

Security Mode – Specifies the value that shall be written to the *Portal Mode* attribute at the priority specified in the *Security Mode Priority* attribute when the value of the *Security Level* attribute matches or exceeds the value of the *Security Mode Active Level* attribute. This attribute should not be written to "Lockdown" when the Door Sequence object operates in reader terminal mode interfacing to an RDR2. See "States" on page 25 for details.

Security Mode Active Level – Specifies the value the current security level must match or exceed for the security mode to be come active. See "Security Mode" on page 24 for details.

Security Mode Priority – Specifies the priority that is applied to the *Portal Mode* attribute for all security mode operations. See "Security Mode" on page 24 for details.

Shunt Attribute – Specifies the attribute the Door Sequence object shall use to indicate the shunt condition. When the Door Sequence object operates in reader terminal mode, this attribute shall be left blank. See "Shunt Output" on page 29 for details.

Shunt Time – Specifies the number of seconds the portal contact shall be shunted after a regular access grant. See "Shunt Output" on page 29 for details.

NOTE

After an access grant, the shunt time will be cancelled once the door status changes to locked and closed, even if the shunt time has not yet expired."

Shunt Warning Attribute – Specifies the attribute the Door Sequence object shall use to activate the shunt warning annunciator. See "Shunt Warning Output" on page 20 for details.

Shunt Warning Time – Specifies how many seconds before the expiration of the shunt timer the shunt warning annunciator shall be activated. See "Shunt Warning Output" on page 20 for details.

Suppress – Specifies whether the generation of notifications for the door's normal states shall be suppressed.

Suppress Default – Specifies the initial value of the Suppress attribute, and the value of the Suppress attribute when all of its priorities are released.

Suppress Forced Door – Specifies whether the generation of forced open notifications shall be suppressed.

Suppress Forced Door Default – Specifies the default value of the *Suppress Forced Door* attribute, and also that attribute's value when all of its priorities are released.

Suppress Propped Door – Specifies whether the generation of propped open notifications shall be suppressed.

Suppress Propped Door Default – Specifies the default value of the *Suppress Propped Door* attribute, and also that attribute's value when all of its priorities are released.

System Override – Specifies whether the *Portal Mode* attribute should be written to the "Override" state at the priority specified in the *System Override Priority* attribute. See "System Override" on page 23 for details.

System Override Priority – Specifies the priority with which writing the *System Override* attribute impacts the *Portal Mode* attribute. See "Reader Terminal Mode" on page 16 for details.

Timed Override – Specifies the number of seconds a timed override should expire in. See "Timed Override" on page 21 for details.

Timed Override Mode – Specifies the mode in which timed overrides shall be handled by the Door Sequence object. This attribute should not be written to "Timed Shunt" when the Door Sequence object operates in reader terminal mode interfacing to an RDR2 Revision D or lower. See "Timed Override" on page 21 for details.

Timed Override Priority – Specifies the priority with which writing the *Timed Override* attribute impacts the *Portal Mode* attribute. See "Timed Override" on page 21 for details.

Timed Override Warning Attribute – Specifies the attribute the Door Sequence object shall use to activate the timed override warning annunciator. See "Timed Override Warning Output" on page 22 for details.

Timed Override Warning Time – Specifies how many seconds before the expiration of the timed override timer the timed override warning annunciator shall be activated. See "Timed Override Warning Output" on page 22 for details.

COMMANDS

This section describes commands that can be issued to this object from SCT.

Table 2: Door Sequence Object Commands

Command Name	Description
Suppress	Writes the *Suppress* attribute depending on the parameter. See the description below for details. This command accepts priority.
Suppress Forced Door	Writes the *Suppress Forced Door* attribute depending on the parameter. See the description below for details. This command accepts priority.
Suppress Propped Door	Writes the *Suppress Propped Door* attribute depending on the parameter. See the description below for details. This command accepts priority.
Override Start	Writes the *Override* attribute to "True."
Override Release	Writes the *Override* attribute to "False."
Timed Override Start	Writes the *Timed Override* attribute to the number of seconds specified in the parameter. See the description below for details.
Timed Override Release	Writes the *Timed Override* attribute to 0.
Lockdown Start	Writes the *Lockdown* attribute to "True."
Lockdown Release	Writes. the *Lockdown* attribute to "False"
Portal Mode	Writes the *Portal Mode* attribute depending on the parameter. See the description below for details.
Release All Portal Mode	Writes the *Release Portal Mode* attribute to "True."
Release All Suppress	Writes the *Release Suppress* attribute to "True."
Release All Suppress Forced Door	Writes the *Release Suppress Forced Door* attribute to "True."
Release All Suppress Propped Door	Writes the *Release Suppress Propped Door* attribute to "True."
Change Attribute	See the description below.

The Suppress command writes the *Suppress* attribute based on the command parameter:

- Release - Releases the *Suppress* attribute at the specified priority.
- Suppress - Writes the *Suppress* attribute to "True" at the specified priority.
- Unsuppress - Writes the *Suppress* attribute to "False" at the specified priority.

Table 3: Suppress Command Parameters

Parameter Name	Data Type	Parameter Type Dependent Properties
Action	Enumeration	0 = Release 1 = Suppress 2 = Unsuppress

The `Suppress Forced Door` command writes the *Suppress Forced Door* attribute based on the command parameter:

- Release - Releases the *Suppress Forced Door* attribute at the specified priority.

- Suppress - Writes the *Suppress Forced Door* attribute to "True" at the specified priority.

- Unsuppress - Writes the *Suppress Forced Door* attribute to "False" at the specified priority.

Table 4: Suppress Forced Door Command Parameters

Parameter Name	Data Type	Parameter Type Dependent Properties
Action	Enumeration	0 = Release 1 = Suppress 2 = Unsuppress

The `Suppress Propped Door` command writes the *Suppress Propped Door* attribute based on the command parameter:

- Release - Releases the *Suppress Propped Door* attribute at the specified priority.

- Suppress - Writes the *Suppress Propped Door* attribute to "True" at the specified priority.

- Unsuppress - Writes the *Suppress Propped Door* attribute to "False" at the specified priority.

Table 5: Suppress Propped Door Command Parameters

Parameter Name	Data Type	Parameter Type Dependent Properties
Action	Enumeration	0 = Release 1 = Suppress 2 = Unsuppress

The `Timed Override Start` command writes the *Timed Override* attribute to the number of seconds specified in the command parameter.

Table 6: Timed Override Start Command Attributes

Parameter Name	Data Type	Parameter Type Dependent Properties
Seconds	Unsigned32	In seconds. Value range from 0 to 1,000,000.

The `Portal Mode` command writes the *Portal Mode* attribute based on the command parameter:

- Release - Releases the *Portal Mode* attribute at the specified priority.

- Normal - Writes the *Portal Mode* attribute to "Normal" at the specified priority.

- Override - Writes the *Portal Mode* attribute to "Override" at the specified priority.

- Lockdown - Writes the *Portal Mode* attribute to "Lockdown" at the specified priority.

Table 7: Portal Mode Command Attribute

Parameter Name	Data Type	Parameter Type Dependent Properties
Action	Enumeration	0 = Release 1 = Normal 2 = Override 3 = Lockdown

The `Change Attribute` is a generic command available for writing the attributes of an object. It is mainly used to change an attribute value from those features which work only with commands. For the sole purpose of giving a generic example, there is no command defined to change the *Notify Priority* attribute of an object. `Change Attribute` could, therefore, be used to change the *Notify Priority* attribute through an interlock or multiple command, both features which require commands to be entered. The `Change Attribute` command requires two parameters:

- Attribute - This parameter specifies which attribute of the object is to be written. Only writable attributes may be changed by this command.

- New value - This parameter specifies new value to be written and must be the same data type as the attribute. The only data types allowed in this command are those allowed as command parameters. A command priority can be specified if the attribute to be changed is a prioritized attribute.

VIEWS

This section illustrates how the System Configuration Tool displays properties of the Door Sequence object. These screens also allow you to set the values of configurable attributes. For more information refer to the *System Configuration Tool (SCT)* manual.

Figure 2: Configuration View (Basic)

Figure 3: Configuration View (Advanced)

DESCRIPTION OF OPERATION

Reader Terminal Mode

The reader terminal mode is configured by referencing an S300 Reader Terminal object in the Door Sequence object's *Reader Terminal object* attribute.

The "Attributes" section on page 2 details which attributes and which attribute values are not supported when the Door Sequence object operates in reader terminal mode. If configured with any unsupported attribute values, the Door Sequence object does not properly carry out the related function.

Table 8 summarizes the minimally required versions of RDR2 and RDR2S controllers.

Table 8: Features Supported by RDR2 and RDR2S

Feature	RDR2	RDR2S	RDR2S-A	RDR8S
Indication of output status in the *Access*, *Shunt*, *Green Light* and *Red Light* attributes	-	-		
Portal Mode attribute state of "Lockdown" is indicated by continuously lit red light	-	-	-	-
Portal Mode attribute state of "Lockdown" disables Request to Exit function at field controller	-	-	-	-
Aux Mode attribute option "Disabled"	-	-	-	-
Alternate Access	Rev. E	Rev. N	Rev. B	Rev. A
Anti-Tailgating attribute option "Re-lock on Open"	Rev. E	Rev. N	Rev. A	Rev. A
Timed Override Mode attribute option "Timed Shunt"	Rev. E	Rev. N	Rev. A	Rev. A
Aux Mode attribute options "Shunt and Unlock Only" and "Shunt and Green"	-	Rev. Q	Rev. A	Rev. A
Extending the shunt on valid access decision	-	Rev. Q	Rev. A	Rev. A

Writing the *Decision Category* attribute in reader terminal mode causes different effects based on the versions of the connected field controller, which are summarized in Table 9. (The *Decision Category* attribute is an internal attribute.)

Table 9: Decision Category Attribute Use in RDR2

Decision Category Attribute	Field Controller	Behavior
None	Any	No reaction.
Granted	Any	Turns on the strike output and the green light for the time specified in the *Access Time* attribute. Turns on the shunt output for the time specified in the *Shunt Time* attribute
Valid	Any	Turns on the green light for the time specified in the *Access Time* attribute.
Denied	Any	Turns on the red light for 1.5 seconds
Deferred	Any	No reaction.
Unidentified	Any	Turns on the red light for 1.5 seconds
Silent	Any	No reaction.

Table 9: Decision Category Attribute Use in RDR2

Decision Category Attribute	Field Controller	Behavior
Granted Alternate	RDR Rev. D or lower	The same as if *Decision Category* attribute was written to "Granted"
Granted Alternate	Any other than RDR Rev. D or lower	Turns on the strike output and the green light for the time specified in the *Alternate Access Time* attribute. Limited to 120 seconds. Turns on the shunt output for the following time: *Alternate Access Time - Access Time + Shunt Time*.

Portal Mode Attribute

Priority Support

The *Portal Mode* attribute supports prioritization, as described in the BACnet standard. The initiator of a WriteAttribute service chooses the priority used for writing the attribute. Priorities range from 1 (highest) to 16 (lowest).

The *Portal Mode* attribute may be written with either one of its attribute values, or a null value. Writing a null value at a given priority is referred to as "releasing the priority."

The *Portal Mode* attribute uses a priority array with one entry per possible priority, in which the attribute value with the highest priority determines the actual attribute value. When all priorities are released, the *Portal Mode* attribute value is determined by the value of the *Portal Default* attribute.

Support for initiating prioritized WriteAttribute services is built into many BACnet and Johnson Controls user interface devices, and into a range of BACnet and Johnson Controls standard objects, such as the Schedule object and the Multiple Command object.

Recommended Priorities

Each initiator of a prioritized write is free to choose a priority deemed necessary in the scope of the entire system. Schedule objects typically write attributes at priority 15, whereas operator overrides from a central location are typically done at priority 8.

It is highly recommended that all features, such as override, timed override, system override, and lock each use a dedicated priority, so that when a feature releases its priority, it does not inadvertently interfere with the operation of another feature.

The following priorities are recommended for the most common application.

■   Scheduled overrides should write the *Portal Mode* attribute to the "Override" state at priority 15.

Alternatively, scheduled overrides may write the *Override* attribute to "True" while the *Override Priority* attribute is set to 15.

■ Applications that want to temporarily block scheduled overrides should write the *Portal Mode* attribute to the "Normal" state at priority 14.

■ Timed overrides should be invoked by writing *Timed Override* attribute while the *Timed Override Priority* attribute is set to 13.

■ Applications that want to temporarily block scheduled and timed overrides should write the *Portal Mode* attribute to the "Normal" state at priority 12.

■ Applications that want to lock the portal should write the *Portal Mode* attribute to "Lockdown" at priority 11.

Alternatively, applications that want to lock the portal may write the *Lockdown* attribute to "True" while the *Lockdown Priority* attribute is set to 11.

■ Security mode is recommended to be configured at priority 10. This makes it a higher priority than all other features except for the system override.

■ System overrides should be invoked by writing *System Override* attribute while the *System Override Priority* attribute is set to 9.

In the Metasys standard there are recommendations for priorities for manual life safety, automatic life safety, and other features. These priorities range from 1 through 8, and would thereby always take priority over the recommended priorities listed above. Priority 1 is recommended for manual emergency, priority 2 is recommended for fire applications. These priorities are supported, but they have to be explicitly set and released by writing directly to the *Portal Mode* attribute.

Timed Override Attribute

The timed override sequence is invoked by the Access Control object writing the Door Sequence object's *Timed Override* attribute. See "Timed Override" on page 21 for details.

Auxiliary Input

The Door Sequence object may reference an auxiliary input by its *Auxiliary Input Attribute* attribute. This attribute shall be blank when no auxiliary input functions are desired.

The Door Sequence object may set an auxiliary flag to indicate permanent auxiliary access, and also may trigger a timed auxiliary access. The effects of auxiliary access are described in more detail in the description of the access, shunt, and green light outputs.

Trigger on Rising Edge

When the *Momentary Aux* attribute is set to "True," the Door Sequence object triggers an auxiliary access every time the auxiliary input changes to the active state.

Trigger on Falling Edge

When the *Momentary Aux* attribute is set to "False," the Door Sequence object sets its auxiliary flag when the auxiliary input changes to the active state, and resets its auxiliary flag when the auxiliary input changes to the inactive state. It also triggers an auxiliary access every time the auxiliary input changes to the inactive state.

Shunt Warning Output

The Door Sequence object may reference a shunt expiration annunciation output by its *Shunt Warning Attribute* attribute. This attribute shall be blank when no shunt expiration annunciation functions are desired.

When the *Shunt Warning Attribute* attribute is not blank, the Door Sequence object schedules its shunt warning timer to expire the number of seconds specified in the *Shunt Warning Time* attribute before the shunt timer expires, provided that this point in time is at least 1 second in the future.

When the shunt warning timer expires, the attribute specified by *Shunt Warning Attribute* is written to 1. The attribute specified by *Shunt Warning Attribute* is written to 0 when the portal contact closes or when the shunt timer is extended to a value greater than the *Shunt Warning Time* attribute.

The shunt warning timer may never elapse without its corresponding shunt timer elapsing. This means that every time the shunt timer is modified, the shunt warning timer is adjusted accordingly.

Timed Shunt

It is possible to direct a timed override to apply to the shunt time only. For this purpose the Door Sequence object's *Timed Override Mode* attribute must be set to the "Timed Shunt" state. In this case, the *Timed Override* attribute can only be written with a non zero value when the *Portal Mode* attribute is in the "Normal" state. Otherwise, all attempts to write the *Timed Override* attribute with a non zero value are ignored.

When the *Timed Override* attribute is written to a non zero value under these conditions, the Door Sequence object initializes its access timer to the value of the *Access Time* attribute, unless a longer access timer is already elapsing, it initializes its shunt timer to the value of the *Timed Override* attribute, unless a longer shunt timer is already elapsing, and it initializes its green light timer to the value of the *Access Time* attribute, unless a longer green light timer is already elapsing.

The typical initiator of timed shunts is the Access Control object.

Timed Override

For timed overrides to be allowed the Door Sequence object's *Timed Override Mode* attribute must be set to the "Timed Override" or the "Timed Override Anti-Tailgating" state. In this case, the *Timed Override* attribute can only be written with a non zero value when the *Portal Mode* attribute is not in the "Lockdown" state. Otherwise, all attempts to write the *Timed Override* with a non zero value attribute are ignored.

Writing the *Timed Override* attribute with a non zero value under these conditions causes the Door Sequence object to write its *Portal Mode* attribute to the "Override" state with the priority specified in the *Timed Override Priority* attribute. Writing the *Timed Override* attribute to 0 under these conditions causes the Door Sequence object to release the priority specified in the *Timed Override Priority* attribute.

Typical initiators of timed overrides are the Access Control object and host commands.

Every time the *Timed Override* attribute is written to a non-zero value, the Door Sequence object initializes its override timer to expire in the number of seconds specified by the *Timed Override* attribute.

When the override timer is cancelled or expires, the Door Sequence object releases the priority specified by the *Timed Override Priority* attribute. The override timer is cancelled by writing the *Timed Override* attribute to zero.

Anti-Tailgating

Anti-Tailgating of timed overrides is enabled when the Door Sequence object's *Timed Override Mode* attribute is set to "Timed Override Anti-Tailgating." Timed overrides are anti-tailgated when the portal contact changes to inactive, i.e. the portal closes.

To anti-tailgate a timed override, the Door Sequence object releases the *Portal Mode* attribute at the priority specified in the *Timed Override Priority* attribute.

In case no portal contact is specified in *Portal Contact Attribute*, the portal contact never changes, and therefore a timed override is never anti-tailgated.

Security Level Operation

Anti-Tailgating of timed overrides is enabled when the Door Sequence object's *Timed Override Mode* attribute is set to "Timed Override Anti-Tailgating." Timed overrides are anti-tailgated when the portal contact changes to inactive, i.e. to the portal closes.

To anti-tailgate a timed override, the Door Sequence object releases the *Portal Mode* attribute at the priority specified in the *Timed Override Priority* attribute.

In case no portal contact is specified in *Portal Contact Attribute*, the portal contact never changes, and therefore a timed override is never anti-tailgated.

Timed Override Warning Output

The Door Sequence object may reference a timed override expiration annunciation output by its *Timed Override Warning Attribute* attribute. This attribute shall be blank when no timed override expiration annunciation functions are desired.

When the *Timed Override Warning Attribute* attribute is not blank, the Door Sequence object schedules its timed override warning timer to expire the number of seconds specified in the *Timed Override Warning Time* before the override timer expires, provided that this point in time is at least 1 second in the future.

When the timed override warning timer expires, and the *Portal Mode* attribute is in the "Override" state, the attribute specified by *Timed Override Warning Attribute* is written to 1. The attribute specified by *Timed Override Warning Attribute* is written to 0 when the timed override ends, or when the timed override is extended to a value greater than the *Timed Override Warning Time* attribute.

The timed override warning timer may never elapse without its corresponding timed override timer elapsing. This means that every time the timed override timer is modified, the timed override warning timer is adjusted accordingly.

Override

The portal can be overridden by writing the *Portal Mode* attribute to the "Override" state at an appropriate priority. The override is removed by releasing the priority used for writing the "Override" state. The portal is only overridden as long as the "Override" state is the attribute value with the highest priority in the priority array.

An alternative method can be used by objects that do not support writing other attributes with the required priority. In this case, the initiating object needs to write the Door Sequence object's *Override* attribute to "True." This causes the Door Sequence object to write its *Portal Mode* attribute to the "Override" state with the priority specified in the *Override Priority* attribute. Writing the Door Sequence object's *Override* attribute to "False" causes the Door Sequence object to release the priority specified in the *Override Priority* attribute.

Typical initiators of overrides are Schedule objects and host commands. Each initiator is free to choose a priority deemed necessary in the scope of the entire system.

In case the override is done on a scheduled basis, but is not supposed to take effect until another condition has been met, the *Portal Mode* attribute shall be written to the "Normal" state at a priority higher than that used for the scheduled override. By releasing the priority used for the "Normal" state the scheduled override becomes effective.

System Override

Writing the *System Override* attribute is similar to writing the *Override* attribute, with the additional benefit that the *System Override* attribute is archived every time it is written.

Writing the Door Sequence object's *System Override* attribute to "True" causes the Door Sequence object to write its *Portal Mode* attribute to the "Override" state with the priority specified in the *System Override Priority* attribute. Writing the Door Sequence object's *System Override* attribute to "False" causes the Door Sequence object to release the priority specified in the *System Override Priority* attribute.

When the Door Sequence object starts up, while the *System Override* attribute is "True," it immediately writes its *Portal Mode* attribute to the "Override" state with the priority specified in the *System Override Priority* attribute.

Lockdown

NOTE

Lockdown does not prevent the door from being unlocked based on the activation of the REX input on the RDR and RDR2S.

The portal can be locked by writing the *Portal Mode* attribute to the "Lockdown" state at an appropriate priority. The lock is removed by releasing the priority used for writing the "Lockdown" state. The portal is only locked as long as the "Lockdown" state is the attribute value with the highest priority in the priority array.

An alternative method can be used by objects that do not support writing other attributes with the required priority. In this case, the initiating object needs to write the Door Sequence object's *Lockdown* attribute to "True." This causes the Door Sequence object to write its *Portal Mode* attribute to the "Lockdown" state with the priority specified in the *Lockdown Priority* attribute. Writing the Door Sequence object's *Lockdown* attribute to "False" causes the Door Sequence object to release the priority specified in the *Lockdown Priority* attribute.

Typical initiators of locks are panel events and host commands. Each initiator is free to choose a priority deemed necessary in the scope of the entire system.

Normal

It is possible to write the *Portal Mode* attribute to the "Normal" state at a priority higher than used for timed overrides or a lock. In this case the Door Sequence object does not block or cancel any timers, and incoming timed overrides at a lower priority will still cause the timed override timer and the timed override warning timer to be initialized and elapse. When the timed override warning timer expires while the *Portal Mode* attribute is still in the "Normal" state, no associated actions as described in section 3.16 are performed.

Writing the *Portal Mode* attribute to the "Normal" state at a priority higher than used for timed overrides or a lock is however an unusual application.

Security Mode

The portal can be operating in security mode by writing the *Portal Mode* attribute to the state defined in the *Security Mode* attribute at the priority specified in the *Security Mode Priority* attribute. The security mode is removed by releasing the priority used for writing the *Portal Mode* attribute to the "Security Mode" state. The portal is only in security mode as long as the state defined in the *Security Mode* attribute is the attribute value with the highest priority in the priority array.

The security mode is automatically entered when the value of the *Security Level* attribute matches or exceeds the value of the *Security Mode Active Level* attribute. The security mode is automatically left when the value of the *Security Level* attribute is lower than the value of the *Security Mode Active Level* attribute.

ADVANCED CONFIGURATION

The most common example of a portal is a door. An access controller door portal can be as simple as a single door strike relay, or a complex set of related inputs and outputs, such as inputs for "lock monitor," "door contact," "request to exit," and outputs for strike relay, door opening devices, as well as warning and alarm annunciators.

The Door Sequence object needs to be configured with the rules that impact the operation of the portal. These rules are defined by the contents of the Door Sequence object's configurable attributes.

NOTE
The description of the Door Sequence object's operation assumes that it does not operate in reader terminal mode. For details on this mode, refer to "Reader Terminal Mode" on page 16.

Overview

The following diagram provides an overview of how the Door Sequence object controls the access output, which typically controls the strike lock. Beside the access output, the Door Sequence object may control outputs for the red and the green lights, an output for the shunt condition, and outputs for the shunt, and time override expiration warnings.
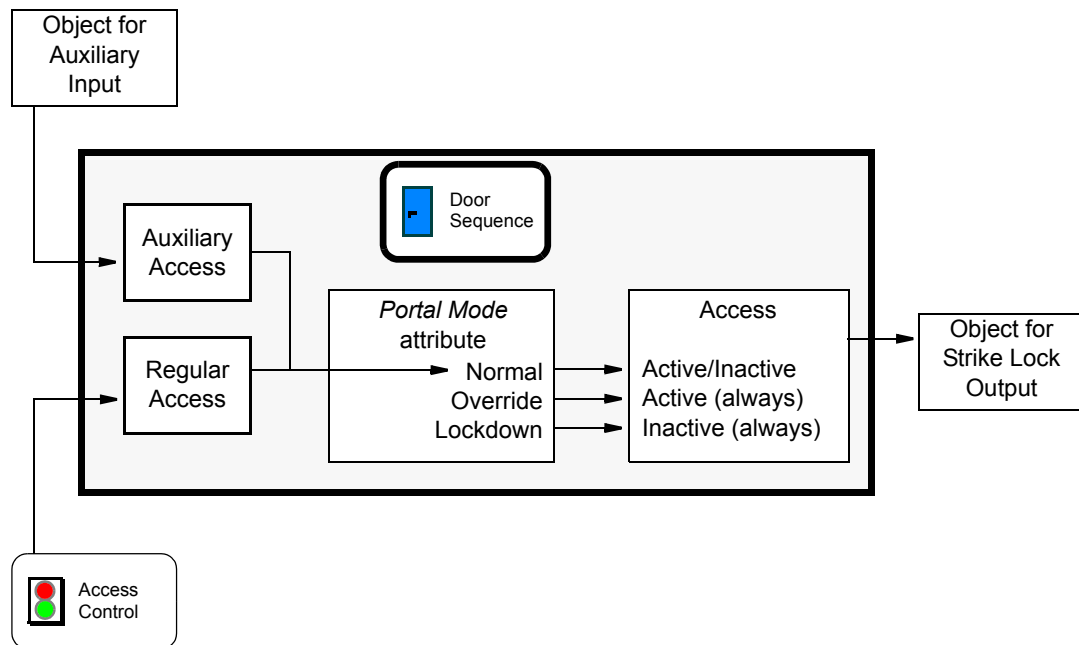
Figure 4: Door Sequence Object Details

Portal Mode Attribute (Advanced)

States

The *Portal Mode* attribute can be in three different states. Depending on the state, some outputs are fixed to certain values, independent of any other activity going on inside the Door Sequence object. Table 10 shows all outputs and the impact the *Portal Mode* attribute has on them.

Table 10: Outputs and Portal Mode Attribute

	Portal Mode **Attribute Value**		
Output	**Override**	**Lockdown**	**Normal**
Access	Always active	Always inactive	See "Access Output" on page 28
Shunt	Always active	Always inactive	See "Shunt Output" on page 29
Shunt Warning	Always inactive	Always inactive	See "Shunt Warning Output" on page 20
Green Light	Always active	See "Green Light Output" on page 30	See "Green Light Output" on page 30
Red Light	See "Red Light Output" on page 31	Always active	See "Red Light Output" on page 31

Table 10: Outputs and Portal Mode Attribute

	Portal Mode Attribute Value		
Output	**Override**	**Lockdown**	**Normal**
Timed Override Warning	See "Timed Override Warning Output" on page 22	Always inactive	See "Timed Override Warning Output" on page 22

Timers

The Door Sequence object uses a set of timers to operate its outputs. Timers are initialized with values representing number of seconds, and they expire after that number of seconds has elapsed. The expiration of a timer may be associated with some actions. When a timer is cancelled, the associated actions with its expiration are not invoked. When a timer is blocked, it is cancelled if applicable, and cannot be initialized anymore.

Table 11 summarizes the activities of the all timers, depending on the value of the *Portal Mode* attribute.

Table 11: Timers and Portal Mode Attribute

	Portal Mode Attribute Value		
Timer	**Override**	**Lockdown**	**Normal**
Access	Blocked	Blocked	Elapsing after granted or auxiliary access
Shunt	Blocked	Blocked	Elapsing after granted or auxiliary access
Shunt Warning	Blocked	Blocked	Elapsing after granted or auxiliary access, if required
Green Light	Cancelled	Cancelled	Elapsing after granted or auxiliary or valid access
Red Light	Cancelled	Cancelled	Elapsing after denied access
Timed Override	See "Normal" on page 23	Blocked	Elapsing after timed override
Timed Override Warning	See "Normal" on page 23	Blocked	Elapsing after timed override, if required

Input Objects

The Door Sequence object may interface directly to the following inputs:

- Lock monitor - Specified by the *Lock Monitor Attribute* attribute

- Portal contact - Specified by the *Portal Contact Attribute* attribute

- Auxiliary input - Specified by the *Auxiliary Input Attribute* attribute

Each input attribute is expected to have up to six states, although each individual input attribute may only use the first two states. The following numerical values are expected for all input attributes:

0 = Inactive

1 = Active

2 = Short

3 = Open

4 = Unknown

5 = Not initialized

Any value higher than 5 is interpreted as "Unknown," which causes the *Present Value* attribute to be set to the "Fault" state, and the *Fault Cause* attribute to indicate the cause of the fault condition.

Output Objects

The Door Sequence object may interface directly to the following outputs:

- Access - Specified by the *Access Attribute* attribute

- Shunt - Specified by the *Shunt Attribute* attribute

- Shunt warning - Specified by the *Shunt Warning Attribute* attribute

- Timed override warning - Specified by the *Timed Override Warning Attribute* attribute

- Red light - Specified by the *Red Light Attribute* attribute

- Green light - Specified by the *Green Light Attribute* attribute

Each output attribute is expected to have two states. The following numerical values are expected for all output attributes:

0 = Deactivate

1 = Activate

Output attributes may be activated or deactivated by other sources. Some output attributes may have the ability to switch back into a certain state after a configured time has elapsed, or flash at a specified pulse rate as long as they are in the "Activated" state.

Lock Monitor Input

The Door Sequence object can be used to compare the expected state of the strike lock to the sensed state of the strike lock, and report any malfunction. The Door Sequence object may reference the attribute representing the lock monitor input by

its *Lock Monitor Attribute* attribute. This attribute shall be blank when no lock monitor is available.

The Door Sequence object signs up for the lock monitor attribute, and compares the reported lock status against the expected lock status contained in the Door Sequence object's *Present Value* attribute. In reader terminal mode, the lock status of the *Present Value* attribute is determined by the value read from the Reader Terminal object. Otherwise, the lock status of the *Present Value* attribute is determined by the Door Sequence object's internal logic. If the lock status reported by the lock monitor input differs from the expected lock status for more than 1 second, the Door Sequence object's *Present Value* attribute is set to "Fault," and the *Fault Cause* attribute is set to one of the following values, unless a higher priority fault applies:

- Stuck Locked - The lock failed to unlock.

- Stuck Unlocked - The lock failed to lock.

- Lock Monitor - The lock monitor reports an electrical malfunction, such as an open or short condition, or another problem with the input object, such as its hardware module being offline.

Access Output

The Door Sequence object maintains an *Access* attribute, which holds the expected access condition.

When the *Access* attribute is in the "Activated" state, the portal shall be unlocked. When the *Access* attribute is in the "Deactivated" state, the portal shall be locked.

Every time this attribute changes, its value is written to the attribute specified by the Door Sequence object's *Access Attribute* attribute. This attribute shall be blank when the access condition is not required to be sent to another object.

The *Access* attribute is always active when the *Portal Mode* attribute is in the "Override" state, and always inactive when the *Portal Mode* attribute is in the "Lockdown" state. Therefore the following sections apply only when the *Portal Mode* attribute is in the "Normal" state.

Normal Operation

The *Access* attribute is active when the auxiliary flag is set or the access timer is elapsing, and inactive when the auxiliary flag is reset and no access timer is elapsing.

An elapsing access timer is never shortened, except when it is cancelled or anti-tailgated.

Anti-Tailgating

Anti-Tailgating of the access output is enabled when the Door Sequence object's *Anti-Tailgating* attribute is not set to "Disabled."

When set to "Re-lock on Open," the access timer is cancelled when the portal contact changes to active.

When set to "Re-lock on Close," the access timer is cancelled when the portal contact changes to inactive.

In case no portal contact is specified in *Portal Contact Attribute*, the portal contact never changes, and therefore the access timer is never cancelled for anti-tailgating.

Auxiliary Input

The access output is not affected by the auxiliary input when the *Aux Mode* attribute is set to "Shunt Only."

Every time an auxiliary access is triggered while the *Aux Mode* attribute is set to "Shunt and Unlock Only" or "Shunt, Unlock, Green Light," the Door Sequence object initializes its access timer to the value of the *Access Time* attribute, unless a longer access timer is already elapsing.

Shunt Output

The Door Sequence object maintains a *Shunt* attribute, which always holds the current shunt state. Every time this attribute changes, its value is written to the attribute specified by the Door Sequence object's *Shunt Attribute* attribute. This attribute shall be blank when the shunt condition is not required to be sent to another object.

The *Shunt* attribute is always active when the *Portal Mode* attribute is in the "Override" state, and always inactive when the *Portal Mode* attribute is in the "Lockdown" state. Therefore the following sections apply only when the *Portal Mode* attribute is in the "Normal" state.

Normal Operation

The *Shunt* attribute is active when the auxiliary input is active or the shunt timer is elapsing, and inactive when the auxiliary input is inactive and no shunt timer is elapsing.

An elapsing shunt timer is never shortened, except when it is cancelled or anti-tailgated.

Anti-Tailgating

Anti-Tailgating of the shunt condition is always enabled.

The shunt timer is cancelled when both the portal contact and the *Access* attribute are inactive.

In case no portal contact is specified in *Portal Contact Attribute*, the portal contact is always considered active, and therefore shunt timers are never cancelled.

Auxiliary Input

Every time an auxiliary access is triggered, the Door Sequence object initializes its shunt timer to the value of the *Shunt Time* attribute, unless a longer shunt timer is already elapsing.

Green Light Output

The Door Sequence object maintains a *Green Light* attribute, which holds the expected green light condition. Every time this attribute changes, its value is written to the attribute specified by the Door Sequence object's *Green Light Attribute* attribute. This attribute shall be blank when the green light condition is not required to be sent to another object.

The *Green Light* attribute is always active when the *Portal Mode* attribute is in the "Override" state. Therefore the following sections apply only when the *Portal Mode* attribute is in the "Normal" or "Lockdown" state.

Normal Operation

The *Green Light* attribute is active when the auxiliary flag is set or the green light timer is elapsing, and inactive when the auxiliary flag is reset and no green light timer is elapsing.

An elapsing green light timer is never shortened, except when it is cancelled. It is cancelled every time the *Access* attribute changes from active to inactive.

Anti-Tailgating

Anti-Tailgating of the green light output is enabled when the Door Sequence object's *Anti-Tailgating* attribute is not set to "Disabled."

When set to "Re-lock on Open," the green light timer is cancelled when the portal contact changes to active.

When set to "Re-lock on Close," the green light timer is cancelled when the portal contact changes to inactive.

In case no portal contact is specified in *Portal Contact Attribute*, the portal contact never changes, and therefore the green light timer is never cancelled for anti-tailgating.

Auxiliary Input

Every time an auxiliary access is triggered, while the *Aux Mode* attribute is set to "Shunt, Unlock, Green Light" or "Shunt and Green Light," the Door Sequence object initializes its green light timer to the value of the *Access Time attribute*, unless a longer green light timer is already elapsing.

Red Light Output

The Door Sequence object maintains a *Red Light* attribute, which holds the expected red light condition. Every time this attribute changes, its value is written to the attribute specified by the Door Sequence object's *Red Light Attribute* attribute. This attribute shall be blank when the red light condition is not required to be sent to another object.

The *Red Light* attribute is always active when the *Portal Mode* attribute is in the "Lockdown" state. Otherwise, the *Red Light* attribute is active when the red light timer is elapsing, and inactive when no red light timer is elapsing.

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