Johnson Controls

Object Library

Security Binary Output Object

Version 1.0, December 2008
24-10239-103 Revision B

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SECURITY BINARY OUTPUT OBJECT

INTRODUCTION

The Security Binary Output object defines Johnson Controls mechanism to control the state of a physical two-state output point for security applications.

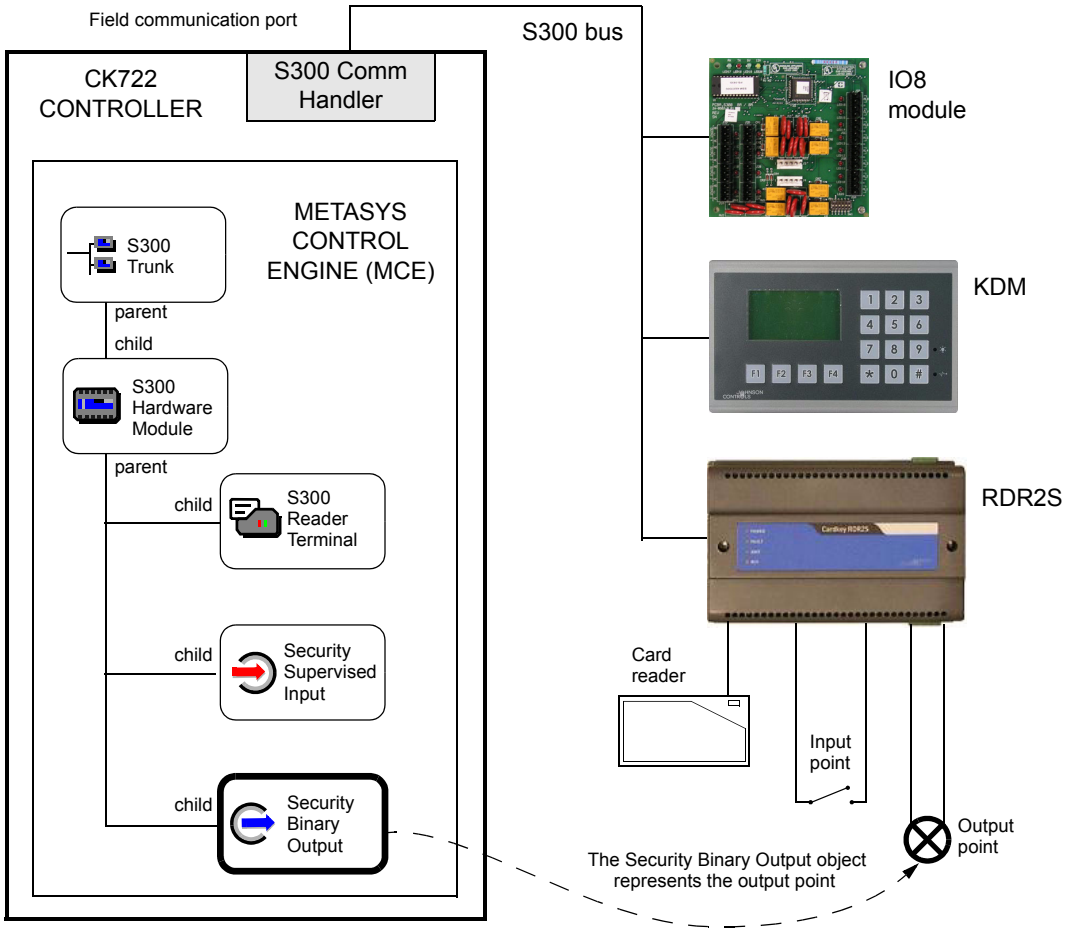

Figure 1: Security Binary Output Object

ATTRIBUTES

This section describes visible attributes specific to the Security Binary Output 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.

For detailed information on BACnet properties, refer to *ANSI/ASHRAE Standard 1352001 - A Data Communication Protocol for Building Automation and Control Networks*.

Table 1: Security Binary Output Object Attributes

Attribute Name	Attribute Number	Data Type	Notes	Initial Value	Values/Options/ Range
Actual Value	3727	Enumeration	F	-	0 = Inactive 1 = Active 2 = Unknown
Connector	3715	Enumeration	WCA	-	See Table 2
Default Value[1]	3113	Enumeration	WCA	-	0 = Inactive 1 = Active 2 = Unknown
Duration[1]	1080	Float	WCA	-	In seconds 0 - 1,000,000
Flash Width High	3730	Float	WCA	-	In seconds 0 - 1,000,000
Flash Width Low	3731	Float	WCA	-	In seconds 0 -1,000,000
Hardware Module Number	3711	Unsigned32	-	-	Value is inherited from parent object
Hardware Module Type	3710	Enumeration	-	-	Value is inherited from parent object
Notification Class	17	Unsigned32	WCA	1	Refer to *BACnet Standard 12.19.15*
Notify Priority	3644	Unsigned8	WCA	-	-
Polarity[2]	84	Enumeration	WCA	-	0 = Normal 1 = Reverse
Present Value	85	Enumeration	WVZ	*Default Value*	0 = Inactive 1 = Active 2 = Unknown
Release Present Value	3737	Boolean	W	-	-
Temp Duration	3733	Float	W	-	In seconds -1 to 1,000,000

Table 1: Security Binary Output Object Attributes

Attribute Name	Attribute Number	Data Type	Notes	Initial Value	Values/Options/ Range
Temp Flash Width High	3734	Float	W	-	In seconds 0 - 1,000,000
Temp Flash Width Low	3735	Float	W	-	In seconds 0 - 1,000,000
Trunk Number	549	Unsigned8	-	-	Value is inherited from parent object
Unknown Notification	3720	Boolean	WCA	-	-

A - Archive, C - Configurable, F- PMI (Person/Machine Interface) refreshing, W - Writable, V - Default value redirected, Z - Priority allowed on write

[1] If the *Default Value* attribute is set to “Active,” the *Duration* attribute value must be either 0 or greater than 25 seconds to ensure proper operation.

[2] Not currently supported.

Table 2: Connector Attribute Values

***Hardware Module Type* Attribute**	***Connector* Attribute Values**	
Generic	0 to 99: 0 = Output 1 1 = Output 2 etc.	
RDR2S	0 = OUT11 1 = OUT12 2 = OUT13 3 = OUT01 4 = NO / NC (top)	5 = OUT21 6 = OUT22 7 = OUT23 8 = OUT02 9 = NO / NC (bottom)
RDR2S-A	0 = Reader 1 Red LED 1 = Reader 1 Green LED 2 = Reader 1 Shunt 4 = Reader 1 Strike	5 = Reader 2 Red LED 6 = Reader 2 Green LED 7 = Reader 2 Shunt 9 = Reader 2 Strike

Table 2: Connector Attribute Values

***Hardware Module Type* Attribute**	***Connector* Attribute Values**
RDR8S	0 = Reader 1 Red LED 1 = Reader 1 Green LED 2 = Reader 1 Strike 3 = Reader 1 Shunt 4 = Reader 2 Red LED 5 = Reader 2 Green LED 6 = Reader 2 Strike 7 = Reader 2 Shunt 8 = Reader 3 Red LED 9 = Reader 3 Green LED 10 = Reader 3 Strike 11 = Reader 3 Shunt 12 = Reader 4 Red LED 13 = Reader 4 Green LED 14 = Reader 4 Strike 15 = Reader 4 Shunt 16 = Reader 5 Red LED 17 = Reader 5 Green LED 18 = Reader 5 Strike 19 = Reader 5 Shunt 20 = Reader 6 Red LED 21 = Reader 6 Green LED 22 = Reader 6 Strike 23 = Reader 6 Shunt 24 = Reader 7 Red LED 25 = Reader 7 Green LED 26 = Reader 7 Strike 27 = Reader 7 Shunt 28 = Reader 8 Red LED 29 = Reader 8 Green LED 30 = Reader 8 Strike 31 = Reader 8 Shunt
RDR2, SI8, I16	No selection available
IO8, SIO8	0 to 7: 0 = OUTPUT 1 NO/NC 1 = OUTPUT 2 NO/NC etc.
CK722	0 = BINARY OUT1 NO/NC

Actual Value – Indicates the actual logical state of the output as reported by the hardware that handles the output.

Connector – Specifies the physical output connector on the hardware module that this object is associated with. The enumeration set varies with the current value of the *Hardware Module Type* attribute.

Default Value – Specifies the initial value of the *Present Value* attribute, and the value of the *Present Value* attribute when all of its priorities are released. Even though the value of this attribute is applied to the *Present Value* attribute immediately after the object receives the instructions to enable the field commands by the MCE, the physical output is only affected when the value is either Inactive or "Active." A value of "Unknown" lets the physical output unchanged.

Duration – Specifies the number of seconds that the logical state of the output should be "Active," when the *Present Value* is written to the "Active" state. Timing an output depends on certain conditions, which are specified in "Present Value" on page 10.

Flash Width High – Specifies the time in seconds for which the output is in the high flash state before switching to the low flash state. If no flashing is desired, this attribute must be set to 0. This function is not supported when the output resides on the hardware listed in "Hardware and Software Requirements" on page 6.

Flash Width Low – Specifies the time in seconds for which the output is in the low flash state before switching to the high flash state. If no flashing is desired, this attribute must be set to 0. This function is not supported when the output resides on the hardware listed in "Hardware and Software Requirements" on page 6.

Hardware Module Number - Indicates the logical hardware module number that this object is associated with. The object computes the value for this attribute from information provided by its parent.

Hardware Module Type - Indicates the type of hardware module that this object is associated with. The object computes the value for this attribute from information provided by its parent.

Notification Class – Specifies which Notification Class object should be used by the Binary Output object to send its notifications to.

Notify Priority – Specifies the Priority parameter of all notifications generated by the Binary Output object.

Polarity – Specifies the relationship between the physical state of the output and the commanded logical state represented by the *Present Value* attribute. A value of 0 indicates "Normal," a value of 1 indicates "Reverse."

NOTE

The Polarity attribute is not currently supported. It is provided only for compliance with the BACnet standard.

Present Value – Specifies the commanded logical state of the output at the highest pending priority. A value of 0 means "Inactive," 1 means "Active" and 2 means "Unknown." See "Present Value" on page 10 for details.

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

Temp Duration – This attribute provides a means to activate the output for a specific time without having to change the object's configuration. See "Present Value" on page 10 for details. This function is not supported when the output resides on the hardware listed in "Hardware and Software Requirements" on page 6.

Temp Flash Width High – This attribute provides a means to flash the output at a specified wave form without having to change the object's configuration. See "Present Value" on page 10 for details. This function is not supported when the output resides on the hardware listed in "Hardware and Software Requirements" on page 6.

Temp Flash Width Low – This attribute provides a means to pulse the output at a a specified wave form without having to change the object's configuration. See "Present Value" on page 10 for details. This function is not supported when the output resides on the hardware listed in "Hardware and Software Requirements" on page 6.

Trunk Number - Indicates the trunk that this object belongs to. In case of an on-board output, the object must be a child of the Device object, so this attribute is automatically set to 0. In case the output resides on an S300 module, the object must be a child of an S300 Hardware Module object, so the value of this attribute is inherited from the S300 Hardware Module object's *Trunk Number* attribute.

Unknown Notification – Specifies whether a notification should be generated when the *Actual Value* attribute changes to "Unknown." If not, a notification is also not generated when the *Actual Value* attribute changes from "Unknown" to the previously reported state.

Hardware and Software Requirements

Some functions of the Binary Output object are not supported, when the output resides on a hardware module that does not support that function. The following list shows the restrictions for the currently available hardware modules.

Attribute	Hardware Limitations
Flash Width High	Not supported on RDR2, STI-MUX, and RDR2S Rev. Q or lower; approximated to 0.5 or 1 seconds on IO8 and SIO8.
Flash Width Low	Not supported on RDR2, STI-MUX, and RDR2S Rev. Q or lower; uses *Flash Width High* value approximated to 0.5 or 1 seconds on IO8, SIO8.
Temp Flash Width High	Not supported on RDR2, STI-MUX, and RDR2S Rev. Q or lower; approximated to 0.5 or 1 second on IO8 and SIO8.
Temp Flash Width Low	Not supported on RDR2, STI-MUX, and RDR2S Rev. Q or lower; uses *Temp Flash Width High* value approximated to 0.5 or 1 second on IO8, SIO8.

COMMANDS

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

Table 3: Security Binary Output Object Commands

Command Name	Description
`Output Set`	Writes the *Present Value* attribute and other attributes depending on the parameter. See the description below for details. This command accepts priority.
`Output Set Timed`	Writes the *Present Value* attribute and other attributes depending on the parameter. See the description below for details. This command accepts priority.
`Release All`	Writes the *Release Present Value* attribute to "True."
`Change Attribute`	See the description below.

The `Output Set` command writes the following attributes based on the command parameter:

- Release - Releases the *Present Value* attribute at the specified priority.
- Activate - Writes the *Present Value* attribute to "Active" at the specified priority. If the specified priority is currently the highest, the output will be active as defined by the *Flash Width High*, *Flash Width Low*, and *Duration* attributes.
- Deactivate - Writes the *Present Value* attribute to *Inactive* at the specified priority. If the specified priority is currently the highest, the output will be inactive.
- Slow Flash - Writes the *Temp Duration* attribute to 0 seconds, writes the *Temp Flash Width High* attribute to 1 second, writes the *Temp Flash Width Low* attribute to 1 second, and writes the *Present Value* attribute to "Active" at the specified priority. If the specified priority is currently the highest, the output will be flashing at Hz until the *Present Value* attribute is written at the same or a higher priority.
- Fast Flash - Writes the *Temp Duration* attribute to 0 seconds, writes the *Temp Flash Width High* attribute to 0.5 seconds, writes the *Temp Flash Width Low* attribute to 0.5 seconds, and writes the *Present Value* attribute to "Active" at the specified priority. If the specified priority is currently the highest, the output will be flashing at 1 Hz until the *Present Value* attribute is written at the same or a higher priority.
- Steady - Writes the *Temp Duration* attribute to 0 seconds, writes the *Temp Flash Width High* attribute to 1 second, writes the *Temp Flash Width Low* attribute to 0 seconds, and writes the *Present Value* attribute to "Active" at the specified priority. If the specified priority is currently the highest, the output will be steady on until the *Present Value* attribute is written at the same or a higher priority.

Table 4: Output Set Command Parameters

Parameter Name	Data Type	Parameter Type Dependent Properties
Action	Enumeration	0 = Release 1 = Activate 2 = Deactivate 3 = Slow Flash 4 = Fast Flash 5 = Steady

The `Output Set Timed` command writes the following attributes based on the first command parameter:

- Activate - Writes the *Temp Duration* attribute to the number of seconds specified in the second parameter, and writes the *Present Value* attribute to "Active" at the specified priority. If the specified priority is currently the highest, the output will be active as defined by the *Flash Width High* and *Flash Width Low* attributes, for the number of seconds specified in the second parameter.
- Slow Flash - Writes the *Temp Duration* attribute to the number of seconds specified in the second parameter, writes the *Temp Flash Width High* attribute to 1 second, writes the *Temp Flash Width Low* attribute to 1 second, and writes the *Present Value* attribute to "Active" at the specified priority. If the specified priority is currently the highest, the output will be flashing at Hz for the number of seconds specified in the second parameter.
- Fast Flash - Writes the *Temp Duration* attribute to the number of seconds specified in the second parameter, writes the *Temp Flash Width High* attribute to 0.5 seconds, writes the *Temp Flash Width Low* attribute to 0.5 seconds, and writes the *Present Value* attribute to "Active" at the specified priority. If the specified priority is currently the highest, the output will be flashing at 1 Hz for the number of seconds specified in the second parameter.
- Steady - Writes the *Temp Duration* attribute to the number of seconds specified in the second parameter, writes the *Temp Flash Width High* attribute to 1 second, writes the *Temp Flash Width Low* attribute to 0 seconds, and writes the *Present Value* attribute to "Active" at the specified priority. If the specified priority is currently the highest, the output will be steady on for the number of seconds specified in the second parameter.

Table 5: Output Set Timed Command Parameters

Parameter Name	Data Type	Parameter Type Dependent Properties
Action	Enumeration	1 = Activate 2 = Slow Flash 3 = Fast Flash 4 = Steady
Second	Unsigned32	In seconds. Value range from 0.01 to 1,000,000.

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 Security Binary Output object. This screen also allows you to set the values of configurable attributes. For more information refer to the *System Configuration Tool (SCT)* manual.

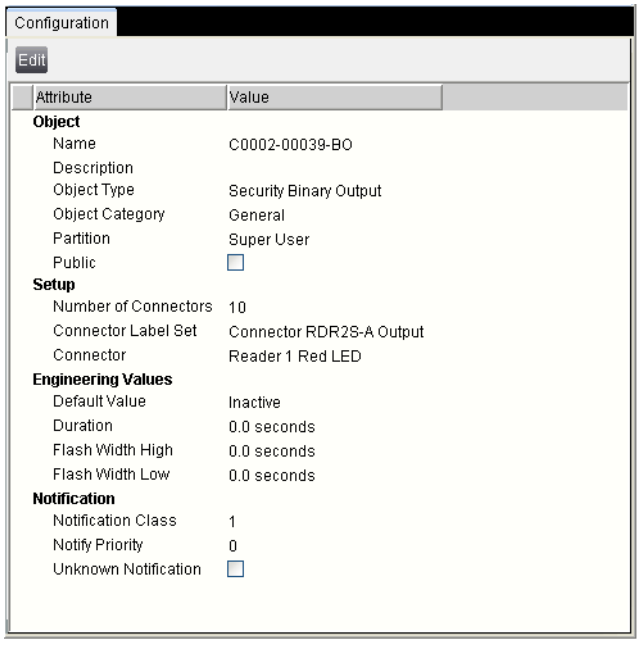

Figure 2: Configuration View

DESCRIPTION OF OPERATION

Present Value

The *Present Value* supports three states, namely “Inactive,” “Active,” and “Unknown.” It also supports a prioritized writing of its attribute value. This means that in each of the 16 priority slots there can either be one of the three states, or no value at all, which is referred to as the priority being released. The state with the highest priority determines the actual attribute value of the *Present Value* attribute. When all priorities are released, the *Present Value* follows the *Default Value* attribute. The object supports a timing capability for the *Present Value* attribute’s “Active” state. For each priority, the object can compute a release time, upon which the “Active” state is removed by releasing the priority.

The object supports a flashing capability for the physical output. For each priority, the object can store values defining the length of the high phase and the low phase.

Unknown State

When writing the *Present Value* attribute to the “Unknown” state at a specified priority, any computed release time and any flash parameters for the priority are cleared. When the *Present Value* attribute is in the “Unknown” state, the object has no control over the physical output. Even though allowed by the object, there is little practical use to write the *Present Value* to the “Unknown” state, other than for simulation or testing purposes.

Active State

When the *Present Value* attribute is written to the “Active” state, the following actions are performed:

- If the *Temp Duration* attribute is greater than 0, the objects uses that value to compute a release time for the priority that the “Active” state was written at. This is true even if the used priority is not the current highest priority, or a release time for the priority was already computed previously.
- If the *Temp Duration* attribute is negative, the “Active” state is applied without a computed release time.
- If the *Temp Duration* attribute is 0, but the *Duration* attribute is greater than 0, the objects uses that value to compute a release time for the priority that the “Active” state was written at. This is true even if the used priority is not the current highest priority, or a release time for the priority was already computed previously.
- If the *Temp Duration* attribute is 0, and the *Duration* attribute is negative, the “Active” state is applied without a computed release time.

- If neither the *Temp Duration* attribute nor the *Duration* attribute are greater than 0, the release time for the used priority is cleared. If both the *Temp Duration* attribute and the *Duration* attribute are 0, the priority is released immediately.
- If any one of the *Temp Flash Width High* and the *Temp Flash Width Low* attributes is greater than 0, the physical state of the output flashes with the specified wave form.
- If both the *Temp Flash Width High* and the *Temp Flash Width Low* attributes are 0, but any one of the *Flash Width High* and the *Flash Width Low* attributes is greater than 0, the physical state of the output flashes with the specified wave form.

The *Temp Duration*, *Temp Flash Width High*, and the *Temp Flash Width Low* attributes are set to 0 every time the *Present Value* attribute is written to or released, regardless of the written state or the specified priority.

Inactive State

When writing the *Present Value* attribute to the "Inactive" state at a specified priority, any computed release time and any flash parameters at the priority are cleared. When the *Present Value* attribute is in the "Inactive" state, no flashing of the output is performed. The physical state of the output is off for a *Polarity* of "Normal," and on for a *Polarity* of "Reverse."

Release

When the *Present Value* attribute is released at a specified priority, any computed release time and any flash parameters at the priority are cleared.

Actual Value

The *Actual Value* attribute indicates the logical state of the output as reported by the hardware that handles the output in case of the "Inactive" or "Active" states. The "Unknown" state is determined either by the object itself when the *Present Value* attribute is set to "Unknown," or when the hardware module that handles the output is offline. This attribute typically follows the *Present Value* attribute with a slight delay. When the *Out Of Service* attribute is set, the *Actual Value* attribute always follows the *Present Value* attribute immediately.