Johnson Controls

Object Library

Multiple Command Object

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MULTIPLE COMMAND OBJECT

INTRODUCTION

The Multiple Command object issues a series of commands to multiple objects by means of single command actions.

The objects assigned to the Multiple Command object are called *slaves*. Whenever the Multiple Command object is set to a new state, the commands associated with the state will be sent to the slave objects after any specified delays.

For each of the slaves a command and delay can be defined for each state. An object does not need to be sent a command for every state. On the other hand, it may be sent more than one command per state by repeating it as a slave object and specifying another command.

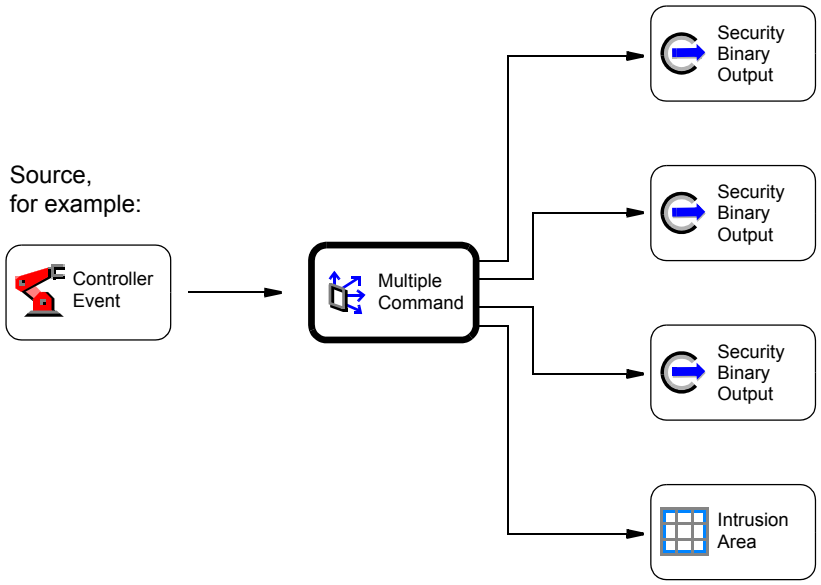

Figure 1: Multiple Command Object

ATTRIBUTES

This object contains attributes common to all objects in the P2000 Security Management System. For details, see the *General Object Information* document. The table below lists only the attributes specific to the Multiple Command object.

Table 1: Multiple Command Object Attributes

Attribute Name	Attribute Number	Data Type	Notes	Initial Value	Values/Options/ Range
Action Table (State0. . . StateN)	793	List of Command References	CW	-	Object Reference, Delay, Command ID, Parameters, Priority **Note:** The total number of commands identified in the Action Table 1 command set should not exceed 40.
Commands Priority	1020	One state from a set	CW	16	See Table 2 on page 3.
Executing	790	True or False		False	False, True
Last Executed Date	1039	Date	N	-	-
Last Executed Time	1044	Time	N	-	-
Number of States	74	Number	C	4	1 - 32
Present Value	85	One state from a set	DW	-	*States Text* attribute identifies the states set for this attribute.
Relinquish Default	104	One state from a set	CNW	-	-
States Text	931	One state from a set	C	States	-

C - Configurable, D - Default attribute for display, N - Value not required, W - Writable

Action Table (State0. . . StateN) – Lists actions to take for each supported state. Each action of the table contains a slave object reference, a delay, a command and its associated parameters, and a priority. The priority in this table is used only when *Commands Priority* attribute is set to "No Priority." The delay is the number of seconds before the given command is issued. Command delays can be lengthened or shortened to result in commands being sent out after, before, or at the same time as any other command.

The total number of commands specified in the Action Table command set should not exceed 40.

Every object accepts the "Change Attribute" command. This command can be used to change the object's writeable attributes of the following types: Boolean, Number (Signed8, Unsigned8, Signed16, Unsigned16, Signed32, Unsigned32), Ennumeration, and Float.

Prioritized attributes are written to the specified value at the priority described in the *Commands Priority* attribute.

To release a prioritized attribute at the specified priority, leave the value of the "Change Attribute" command blank.

Commands Priority – Determines the order by importance for all commands sent. If the "All Commands Priority" option is not selected, the commands are sent at each individual priority specified in the *Action Table* attribute. If the "All Commands Priority" option is selected, then every item in the Action Table is sent a command at the priority specified. For example, if the command chosen is Operator Override, the command priority automatically sets to Operator Override (8) for every item listed in the Action Table. When the All Commands Priority option is selected, you cannot change the command priority within the Action Table.

The *Commands Priority* attribute uses the priorities in the Write Priority Set (see Table 2 on page 3).

Executing – Specifies the current execution status of the object. It is "True" when the object receives a state command and starts sending commands. When all actions are completed for a given state, this flag is set to "False."

Last Executed Date – Indicates the date stamp for the beginning of executing the current state.

Last Executed Time – Indicates the time stamp for the beginning of executing the current state.

Number of States – Specifies the number of possible states this object can have.

Present Value – Indicates the current value of this object.

Relinquish Default – Specifies the default value to be used for the *Present Value* attribute when no commands are currently controlling this object. If this attribute is configured to any value other than "None," the object sends commands for the value immediately.

States Text – Indicates the displayed strings for the *Present Valu*e attribute.

Write Priorities

Table 2: Write Priority Set

Numeric Value	Text
0	No Priority - MC
1	Manual Life Safety - High Priority
2	Auto Life Safety - AS High Priority
3	Priority 3 - 03 High Priority
4	Priority 4 - 04 High Priority

Table 2: Write Priority Set

Numeric Value	Text
5	Critical Equipment - CE High Priority
6	Minimum On Off - MO
7	Heavy Equip Delay - HE
8	Operator Override - OV
9	Priority 9 - 09, System Override – SO
10	Priority 10 - 10, Security Mode - SM
11	Demand Limiting - DL, Lock Down - LD
12	Priority 12 - 12
13	Load Rolling - LR, Timed Override - TO
14	Priority 14 - 14, Elevator - EL, Door Sequence - DS
15	Scheduling - WS
16	Default - MC

COMMANDS

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

Table 3: Multiple Command Object Commands

Command Name	Description
`Multistate 0` to `Multistate 31`	Allows the user to set the *Present Value* attribute. See the description below for details. This is a default command.
`Override`	Allow the user to override the object's *Present Value* attribute. See the description below for details. The parameter specifies the new state.
`Override Release`	Release an override of the object. See the description below for details.
`Enable`	This command will set the *Enabled* attribute "True". Provided the object was disabled, this command will send commands to the slaves for the current state, where the start timing is based on the time that the `Enable` command was received.
`Disable`	On receipt of this command the Multiple Command object will cancel any current execution and will not send out any COV reports. It will set the *Enabled* attribute to "False" and it will not execute its main logic on change of the *Present Value* attribute.
`Change Attribute`	See the description below.

The `Multistate 0..31` command will clear the entries in the priority array property of the *Present Value* attribute for the priorities 9 - 15. It will then place the corresponding state (0 - 31) into the priority array at priority 16. If there's no higher priority command in the priority array, the Multiple Command object's *Present Value* attribute will be set to the state defined by the `Multistate 0..31` command.

The algorithm is as follows:

```
Start:
If Multistate n Value < Number of States
     Clear the Prio 9 - 15 priority array entries of the
     Present Value attribute
Set the Prio 16 priority array entry of the Present Value
     attribute to n
     If there's no higher priority command in the priority
     array
          Set Present Value attribute equal to n
          Call Execute method
End:
```

The PMI text representation of a `Multistate` command is defined by the enum set specified in the *States Text* attribute.

The `Override` command will place the state defined by the parameter of the command into the priority array property of the Multiple Command object's *Present Value* attribute at priority 8 (Manual Override). If there's no higher priority command in the priority array, the Multiple Command object's *Present Value* attribute will be set to the state defined by the parameter.

Table 4: Override Command Parameters

Parameter	Data Type	Parameter Type-Dependent Properties
Value	Enumeration	n=0-31 enumeration set = *States Text* attribute

The algorithm is as follows:

```
Start:
     Set the Prio 8 priority array entry of the Present Value
     attribute to the Override Value.
     If there's no higher priority command in the priority
     array
          Set Present Value attribute equal to the Override
          value
          Call Execute method
End:
```

The PMI text representation of the command parameter is defined by the enum set specified in the *States Text* attribute.

The `Override Release` command releases an `Override` command which clears the priority 8 (Manual Override) entry in the priority array property of the MC object's *Present Value* attribute.

The algorithm is as follows:

```
Start:
     Clear the Prio 8 priority array entry of the Present Value
     attribute
     If Prio 8 has been the highest priority entry
          If there is a lower priority command entry
               Set the Present Value attribute's value to the
               next lower Prio value
          Else
               Set the Present Value attribute's value to the
               Relinquish Default value
     Call Execute method
End:
```

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 Multiple Command object. These screens also allow you to set the values of configurable attributes. For more information refer to the *System Configuration Tool (SCT)* manual.

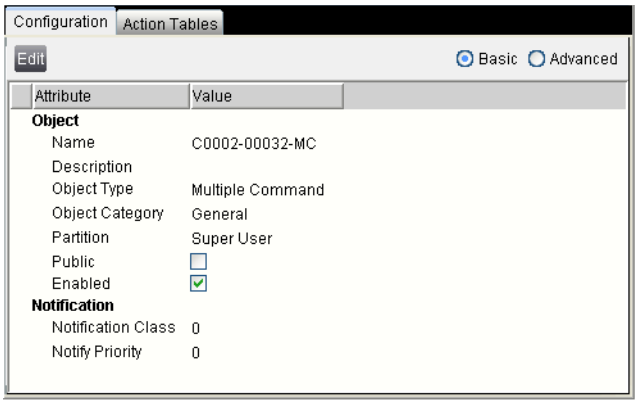

Figure 2: Configuration View (Basic)

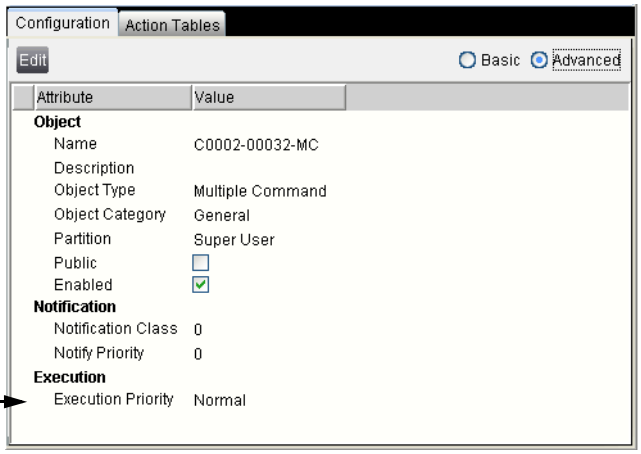

Figure 3: Configuration View (Advanced)

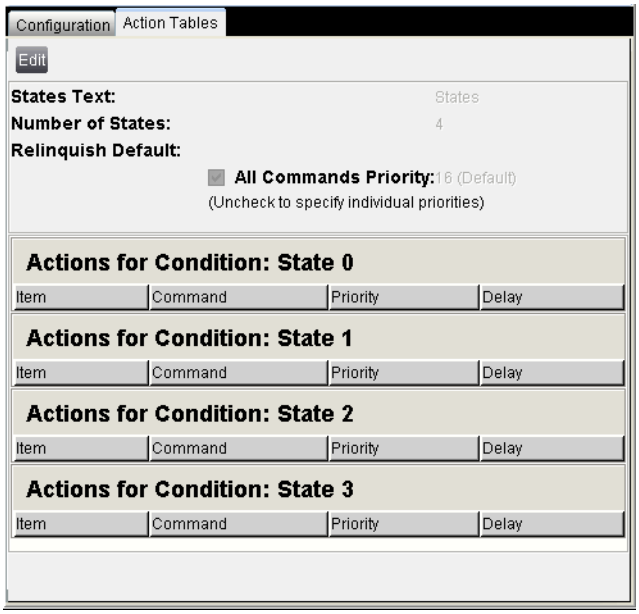

Figure 4: Action Tables View (Advanced)