-METASYS®

Binary Data (BD) Object

Introduction

A Binary Data (BD) object is one of the point object types used by the Metasys® software. Unlike most point objects, BDs are not directly associated with physical sensing hardware. Instead, they treat a binary (also known as Boolean) value obtained as the result of a control process, operator entry, or associated parameter (attribute) of another object just like a hardware input. In this way, various binary values can be given the characteristics and software capabilities of a BI object, including alarm analysis, Change-of-State (COS) reporting, and object summaries.

There are four major applications for a Binary Data object:

- **Pseudo Objects**--Metasys software objects contain many Boolean (0 or 1 logical state) attributes, any of which can be assigned as the associated input to a BD. This allows the attribute to be treated like an object. For example, you might use one of the 32 inputs from an Intelligent Lighting Controller to monitor an exhaust fan. This input would not be defined as a binary input object. Rather, its current value--a Boolean attribute--could be read by a Binary Data object (whenever the value changes) so that you can view the exhaust fan's status in summaries and change-of-state reports.
- **Control Process Results**--Control processes can perform calculations and logical operations for facilities management. The results of these processes can be assigned to BD objects. For example, a control process can determine when to produce more ice for a thermal control unit by taking into account outside air temperature, chilled water usage, and time of day. The result of this process can be read by a BD object so that it is displayed or printed in a system summary. In addition, the BD can use this value to trigger another control process.
- **Duplicate Objects**--It may be desirable to view the status of a single chiller in a number of system summaries. This chiller might work with a dozen air handling units, each of which is affected by its status. A BD object, such as CHIL_ST, can be created under each AHU system name. The status of the chiller can be assigned to all twelve BD objects, allowing for chiller status reporting within each system.

- **User Inputs**--A control process may be created that requires an operator selected variable as one of its inputs. For example, a process may contain logic that controls an area based on time of year. During the summer it performs one control strategy, while in the winter it performs another strategy. An operator can change the current value of a BD to summer or winter, using the Adjust (Set BD) command. This value can then trigger the control process.

Note: A BD object can be used as a load in the Demand Limiting/Load Rolling (DLLR) feature. For BD command priorities, including DLLR, see the *Input Processing* section of this document, and look under *Input Prioritization*. Complete information on the DLLR feature is in the *Demand Limiting/Load Rolling Technical Bulletin (LIT-636106).*

Quick Start

This section tells you how to quickly define the BD from the Operator Workstation (OWS). Since most of the fields in the Definition window are already filled in with default values, all you need to do is fill in the fields without defaults, and make any necessary changes.

Defining the BD

The BD object can be defined:

- online, using the OWS BD Object Definition window
- offline, using the Graphic Programming Language (GPL) Database Template. See the *GPL Programmer's Manual* for instructions.
- offline, using the Data Definition Language (DDL). See the *DDL Programmer's Manual* for instructions.

To define a BD object online at the workstation:

1. Go to the summary of the system in which you want to add the object.
2. Select Item from the Menu bar. Then select New from the Item menu. A dialog box for selecting object type appears.
3. Select Binary Data from the list of object types.
4. Click OK. The BD Object Definition window appears (as shown in Figure 1).

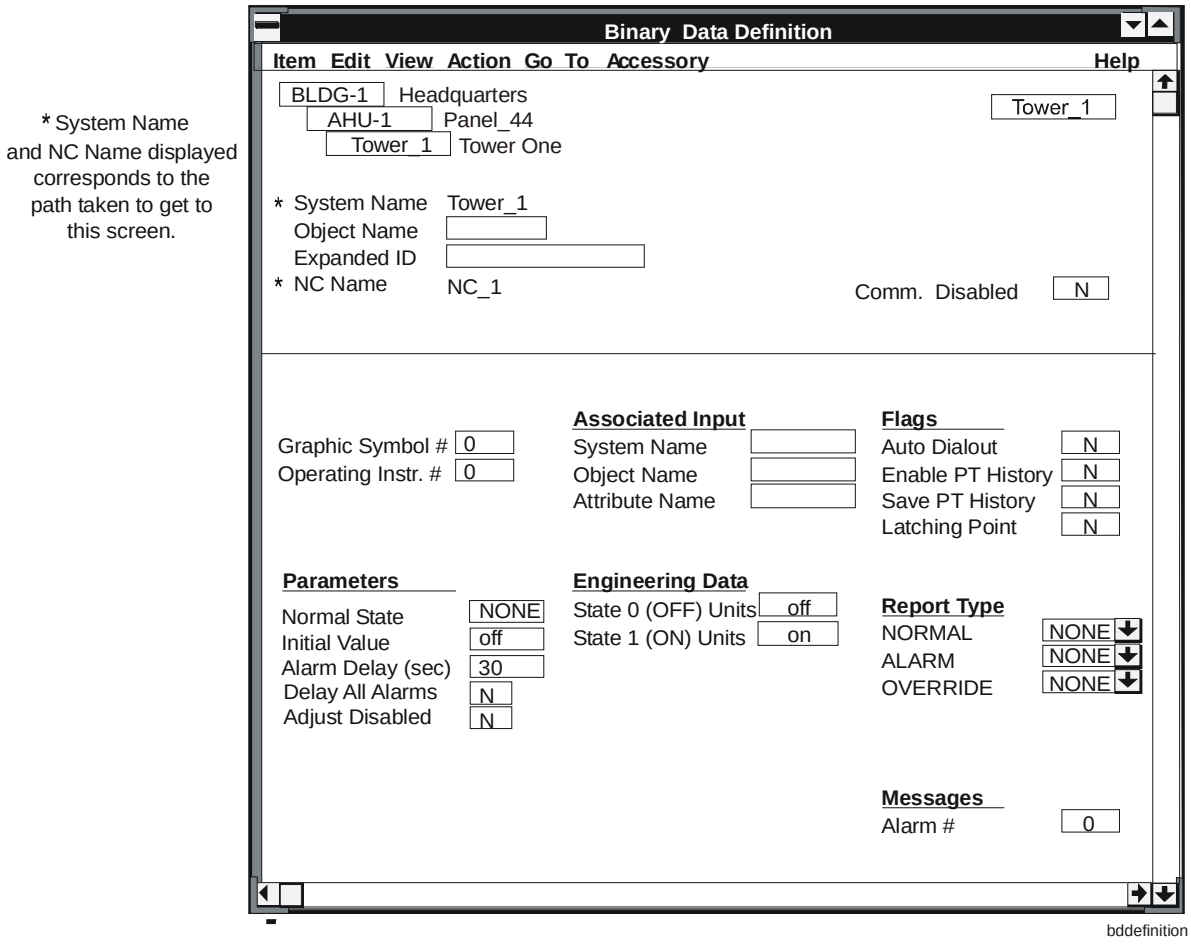

Figure 1: BD Definition Window Displaying Default Settings

Note that some of the fields are blank and some are already filled in. You must fill in the blank attribute fields (e.g., Object Name) because they do not have default settings. The attribute fields that are already filled in contain default settings, which you can either accept or change. Table 1 explains the attributes without default settings. Table 7 describes all BD object attributes. The *Operator Workstation User's Manual* explains the procedures for entering and changing data.

Table 1: BD Attributes without Default Settings

Attribute Label	Description	Entry
Object Name	The object name cannot already exist under the given system name. This name defines the object, such as OCC_MODE (for Occupied mode). Note: If you are mapping the BD to a JC/85/40 software point, the object name must contain the JC/85/40 System Type (F, S, or H), Point Type (BIN, SST, or OPC for OPN/CLO), and the Level 3 name separated by an underscore. For example, HBIN_STA. Refer to the *JC/85 Gateway Application Note (LIT-6363147)* in the *Metasys Network Technical Manual* for details.	8 alphanumeric characters
Expanded ID (optional)	This is an expanded version of the object name. Appears at the Object Focus window, GPL template, and summaries. More clearly identifies the object. For example, OCCUPIED MODE.	24 alphanumeric characters
Associated Input System Name	The name of the system the associated input object resides in.	8 alphanumeric characters
Associated Input Object Name	The name of the associated input object. This object must be defined.	8 alphanumeric characters
Associated Input Attribute Name	The software name of the Boolean attribute whose value will be read by the BD.	8 alphanumeric characters

Note: An entry for Associated Input is not required to use the Adjust function.

5. To save the new BD object, select Item from the menu bar. Then select Save. The new BD object is added to the operational database in the NC.

GPL Template

Default attribute settings are also available in the GPL template. Figure 2 shows the GPL Database Template for the BD object.

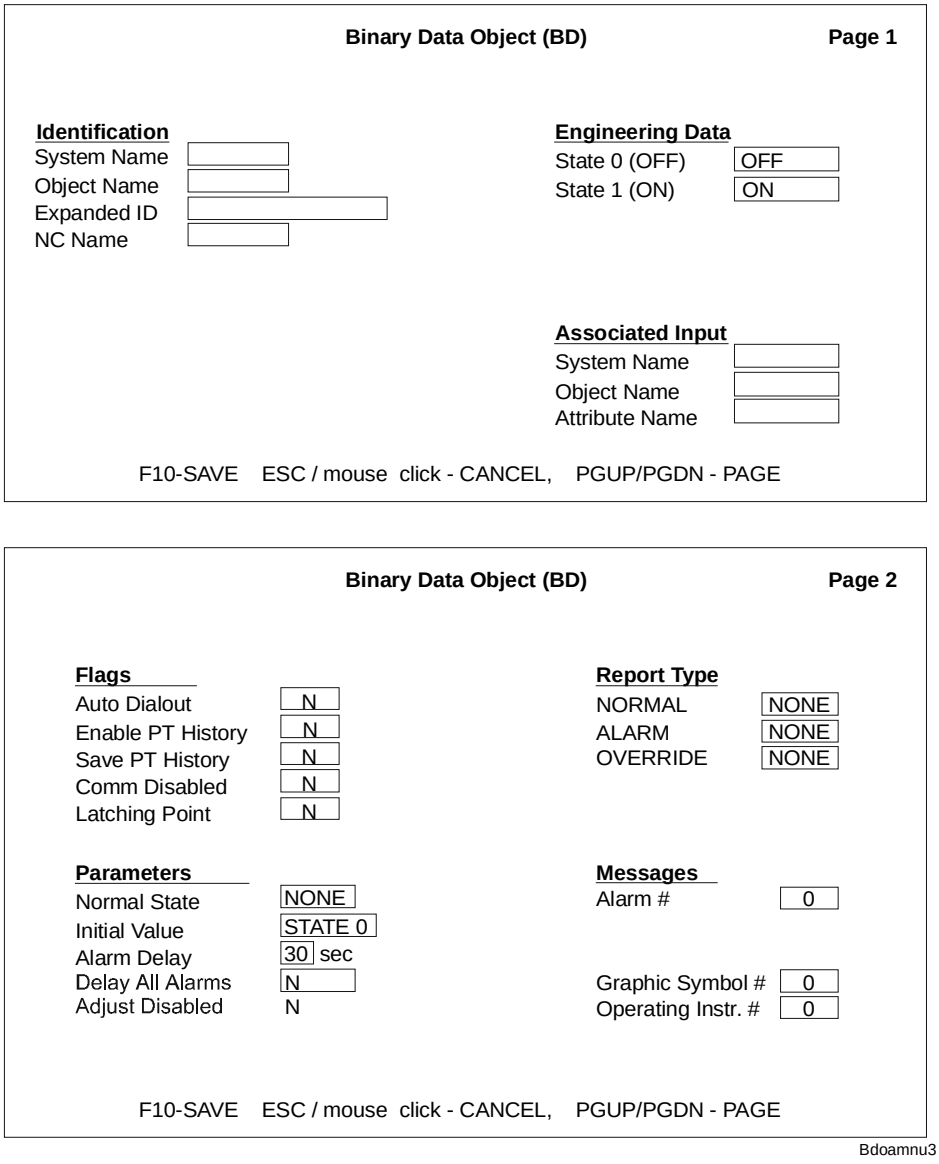

Figure 2: BD GPL Database Template Displaying Default Settings

Modifying and Monitoring the BD

Once the BD is defined, you can modify its attributes using the BD Focus window. You also use the Focus window to monitor and command the BD. You'll find information on using Focus windows in the *Operator Workstation User's Manual*.

You can modify the BD object:

- online, using the OWS BD Object Focus window
- offline, using Graphic Programming Language (GPL) Database Template
- offline, using Data Definition Language (DDL)

This is the end of the *Quick Start* section. If you need more information on data entry procedures, see the *Operator Workstation User's Manual* and *GPL Programmer's Manual*. For additional information on BD attributes, see the remainder of this document, which explains the relationship between various BD attributes from an applications perspective. In addition, you'll find an alphabetized listing of all BD attributes and commands (with descriptions and acceptable entries) at the end of this document.

Note: Refer to the *Control System (CS) Object Technical Bulletin* (*LIT-636102)* for corresponding point mapping tables.

Engineering Overview

Overview of Operation

BD software functions can be divided into three basic categories:

- **Input Processing**--The BD receives input values from a number of sources. The software prioritizes these inputs to determine the BD current value.
- **Alarm Analysis**--The BD current value is compared against a user-defined normal state to determine the object's status (normal or alarm). The status can then be routed as a COS report, and associated message, to operator devices.
- **Triggers and History**--BD attribute changes can be used for other purposes, including triggering control processes and historical archiving.

Functional Flow Diagram

Figure 3 illustrates the general operation of a BD object. The blocks represent the functions performed by the software. The Network Control Module (NCM) performs all BD software functions. Each major block (software function) is summarized after the figure, and then explained in detail throughout this document.

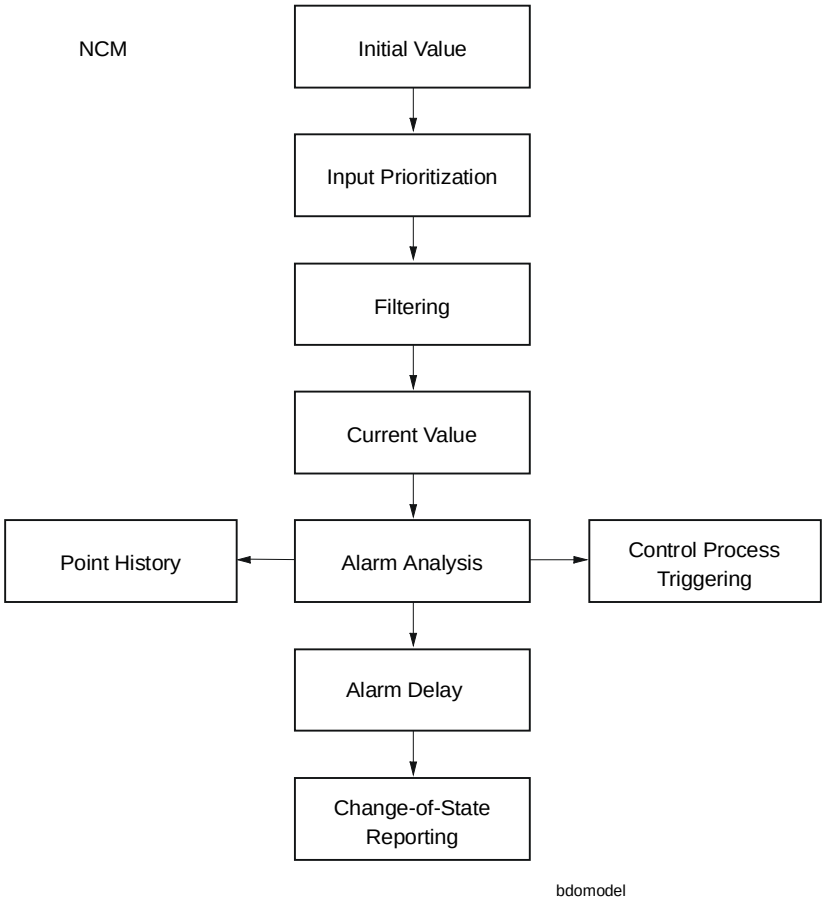

Figure 3: Binary Data General Model

Input Processing

- I**nitial Value**--You may specify an initial value for the BD when defining the object. This becomes the current value of the BD until another input value is received.
- **Input Prioritization--**The Binary Data object receives its input from:
  - a command issued by an operator, control process, Multiple Command (MC) object, Demand Limiting, Load Rolling, or Scheduling.
  - a Boolean attribute of the associated input object. (When this attribute changes state, the new value is immediately read by the BD object.)

    The input value is prioritized, meaning that the highest priority input becomes the BD current value.

- **Current Value**--After input prioritization has occurred, the Binary Data current value is displayed at the BD Focus window and Network Terminal, and in object summaries.

Note: A BD object that is mapped to an associated object's attribute displays that attribute's current value on a system summary. When a command (e.g., user command, schedule) initiates a BD value change, the commanded value is displayed on a system summary, until the associated object's attribute value changes again. There is no indication on the system summary when the commanded value is in effect. This may be undesirable for some applications, so the BD provides the Adjust Disabled attribute, which can be set to Yes to disable the user and scheduling commands (see *Disabling Priority 3 Commands* later in this document).

Alarm Analysis

- **Alarm Analysis**--You may define a normal state for the Binary Data object during database generation. Alarm analysis is performed by comparing the BD current value against the user-defined normal state.
- **Alarm Delay**--This function delays alarm reporting of the BD object for a user-specified period of time. The purpose of alarm delay is to prevent nuisance reports that could result from a BD current value change when the BD object is used as feedback for a Binary Output object or when the source value of the BD comes from a contact that may change its state either momentarily or several times before settling to the new condition (flutter contact). The alarm delay is not activated by a command from an operator, scheduling, or control process to the BD object. See *the Binary Output (BO) Object Technical Bulletin (LIT-636090)* in *the Metasys Network Technical Manual* for information on feedback.
- **Latch Function**--This function causes the BD object to stay in alarm once it changes to an alarm condition. Latching ensures that BD alarm changes are acted upon by an operator or control process before the object returns to a normal state. Only an Unlatch command from an operator or control process can change the latched state.
- **Change-of-State (COS) Reporting**--If an alarm is detected, it may be reported at one or more OWSs or printers. OWSs and printers only receive the alarm report if they were defined as report stations for the particular object during the database generation process.

Triggers and History

- **Control Process Triggering**--changes can trigger (cause) a control process to run.
- **Point History**--Certain attributes of the Binary Data object may be sent to a point history file.

Input Processing

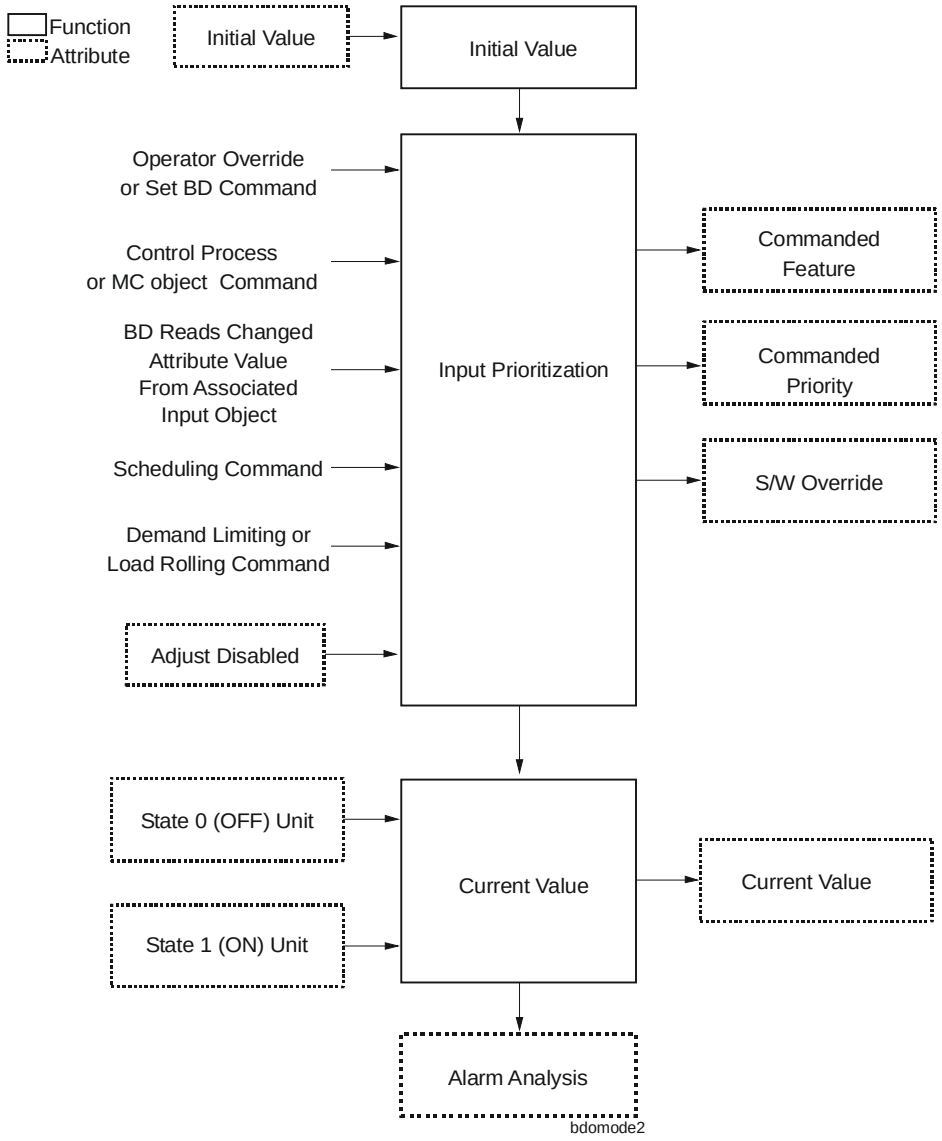

Figure 4: BD Input Processing Functional Flow

BD Input Values

Unlike most point objects, a Binary Data is not directly associated with a physical sensing device. Rather, it receives its input from a number of software sources, including:

- an operator entered initial value
- an operator command or override
- a control process or Multiple Command (MC) object command
- a Boolean attribute (0 or 1 logical state) from another object (its associated input object)
- a Scheduling command
- a Demand Limiting or Load Rolling command

Initial Value Function

This function allows you to specify an initial value attribute for the BD object. The initial value operates at Priority 3. It becomes the current value of the Binary Data object until another input is received. (Another input at Priority 3 will overwrite the initial value.)

The initial value attribute is used if you want the BD to go online with a specific current value, such as Occup (for occupied). This might be helpful in an application where Scheduling will change the current value of the BD on a time basis. At 8:00 a.m. the BD will be commanded to Occup, and at 5:00 p.m. it will be commanded to Unocc. If the BD is added to the system at 12 noon, you don't want to wait until the next day for Scheduling to issue the Occup (Set BD) command. Instead, the initial value attribute can immediately set the BD to Occup.

The initial value attribute also allows you to designate a neutral or safe setting for the BD. For example, you might set the initial value to Unocc for a BD that will be added to the system after 5 p.m. This would prevent unnecessary operation of fans after work hours.

Attributes You Set for the Initial Value Function

The Initial Value attribute affects the Initial Value Function.

Initial Value is an attribute that you specify in engineering units, such as On or Off.

Note: If you are using DDL to define the BD and you don't define an initial value, it will default to whatever you designated for the BD State 0 engineering unit. For example, if you defined the State 0 engineering unit as Off, this will become the BD initial value. In GPL and online generation, you must define an initial value because there is no default setting.

Input Prioritization

Inputs to Binary Data objects are prioritized. This means that the highest priority input becomes the BD current value.

How Input Prioritization Works

Each Binary Data object has its own object record. This record contains a priority table that serves three purposes:

1. It lists the priority levels of all possible inputs to the BD object, as shown in Table 2.
2. It keeps track of inputs to the BD, and performs a priority check to determine which input should become the BD current value. This is shown in Table 3.
3. It records the input that currently controls the object (i.e., the input that produces the current value).

Table 2: BD Input Priority Levels

Priority Level	Input Sources
1	Operator Entered Override Command Operator Entered Auto Command
2	Control Process or MC object Set BD Command*a Control Process or MC object Release Command Demand Limiting or Load Rolling Shed Command*b Demand Limiting or Load Rolling Restore Command*b
3	Operator Entered Initial Value Operator Entered Adjust (Set BD) Command*c Control Process or MC Set BD Command*a*c Scheduling Set BD Command*c Associated Input Object's Value

a* A control process or MC object Set BD command can be issued at Priority 2 or 3, depending on what priority level you designate in the process.

b* The Demand Limiting/Load Rolling Shed command is interpreted by the BD as a Set BD command at Priority 2. The Demand Limiting/Load Rolling Restore command operates much like the Release command. It deletes the command in the Priority 2 slot.

c* The Priority 3 Adjust (Set BD) commands can be disabled by setting the Adjust Disabled attribute of the BD to Yes. This prevents the associated input object's value from being overwritten by the Priority 3 commands. The operator can still issue the Override command if he or she needs to change the BD's value manually.

As you can see in Table 2, there are three priority levels that govern the BD current value. The input priority table contains three slots, one for each priority level--Priorities 1, 2, and 3. When an input is sent to a Binary Data object, it is placed in the correct slot. In Table 3, two inputs were sent to the BD--a control process command and an associated input object attribute's changed value. If an input already resides in a given slot, the old input is overwritten with the new input. For example, if another Priority 3 input (such as a Scheduling command) is sent to the Binary Data object in Table 3, the attribute value will be overwritten. This is shown in Table 4.

Table 3: Example of BD Input Prioritization

	Priority Level	Input Sources
	1	
Scheduling Set BD Command (On) →	**2**	Control Process Set BD Command (Off)
Scheduling Set BD Command (On) →	**3**	Associated Input Object's Value (On)

Table 4: Example of BD Input Prioritization

Priority Level	Input Sources
1	
2	Control Process Set BD Command (Off)
3	Scheduling Set BD Command (On)

Scheduling Set BD Command (On) →

This process is ongoing. As inputs are sent to the BD, they are immediately placed in their respective priority slots. The table can hold up to three inputs at once. The input with the highest priority at a given point in time becomes the BD current value. In Table 4, the Control Process Set BD command of Off becomes the current value of the Binary Data because it is the highest priority input to the object.

If a control process sent a Release command to the BD, the Input Prioritization Table would look like Table 5.

Table 5: BD Input Prioritization Process

Priority Level	Input Sources
1	
2	
3	Scheduling Set BD Command (On)

Control Process Release Command →

The Release command can be sent from a control process or Multiple Command (MC) object. It operates at Priority 2, and performs the function of releasing--clearing out the Set BD control process or MC object command. Notice that Slot 2 doesn't have an input value: Release merely deletes whatever is contained in Slot 2. This allows the Slot 3 input to become the BD current value. In this instance, the Scheduling Set BD command of On becomes the Binary Data current value.

The Demand Limiting/Load Rolling Restore command operates like the Release command: it deletes whatever is contained in Slot 2.

If you issue an Override On command from an OWS, the BD Input Prioritization Table will look like Table 6. Override is the highest priority input to the Binary Data object, so the BD current value will change to On.

Table 6: Example of BD Input Prioritization

Priority Level	Input Sources
1	Operator Override Command (On)
2	
3	Scheduling Set BD Command (On)

Control Process Release Command →

How Release Commands Affect Prioritization

It was stated before that a current command can overwrite (replace) an old command of the same priority.

Three other commands--Auto, Release, and Restore--work in a different manner. These commands actually clear out a command or commands. They don't place a value such as Start, Stop in a priority table. Rather, they delete a command from a priority table so that the next highest priority command can take control. For example, in Table 5, a Release command was sent to the BD. This command cleared out Priority 2, allowing the next highest priority command (On at Priority 3) to set the BD object's current value to On.

The following commands perform release functions:

- The **Auto** command releases (clears out) the Priority 1 Override command, allowing the next highest priority command to take control.
- The **Release** command, which is only available in control processes and MCs, clears Priority 2.
- The **Restore** command, issued from Demand Limiting or Load Rolling, works much like the Release command; it clears whatever command is in Priority 2.

Disabling Priority 3 Commands

A BD object that is mapped to an associated object's attribute receives that attribute's current value at Priority 3. Any command issued at Priority 3 (such as the operator-entered Adjust [Set BD] command) overwrites the value set by the associated object until the associated object's attribute value changes again. This may be undesirable for some applications, because there are times when the current value displayed by the BD is not the same as the associated object's attribute value. For example, based on the false information, the operator might issue another Adjust [Set BD] command, possibly triggering a control process at the wrong time. This can be prevented by setting an attribute in the BD object that disables the Priority 3 commands. The operator can still use the Override command to manually set the value of the BD object.

Attributes You Set to Disable Priority 3 Commands

One attribute affects the Priority 3 commands: Adjust Disabled.

Adjust Disabled specifies whether the Priority 3 commands (see Table 2 for a list of the commands) are disabled (Y) or enabled (N). The default setting is N (no). You can set this attribute only when you define the new BD object, it cannot be changed later.

Attributes Affected by Prioritization

Attributes Affected by Input Prioritization

A number of BD attributes change as a result of the input prioritization process. These include:

- Current Value
- Commanded Feature
- Commanded Priority
- S/W Override (when applicable)

Current Value is updated to reflect the highest priority input value to the BD. For example, On could be displayed in this field at the BD Focus window.

Commanded Feature is updated to reflect the source of the current value. *Operator, Scheduling, Control Process, Demand, Load Roll, Initial, Shared, Multiple Cmd* is displayed in this field at the BD Focus window.

Note: Shared=Associated Input Object's Value.

Commanded Priority is updated to reflect the priority level of the Commanded Feature. 1, 2, or 3 is displayed in this field at the BD Focus window.

S/W Override is updated to Y if an operator Override command caused the new current value. Y or N is displayed in this field at the BD Focus window.

Figure 5 shows the Focus window of a BD object whose current value resulted from a Scheduling command.

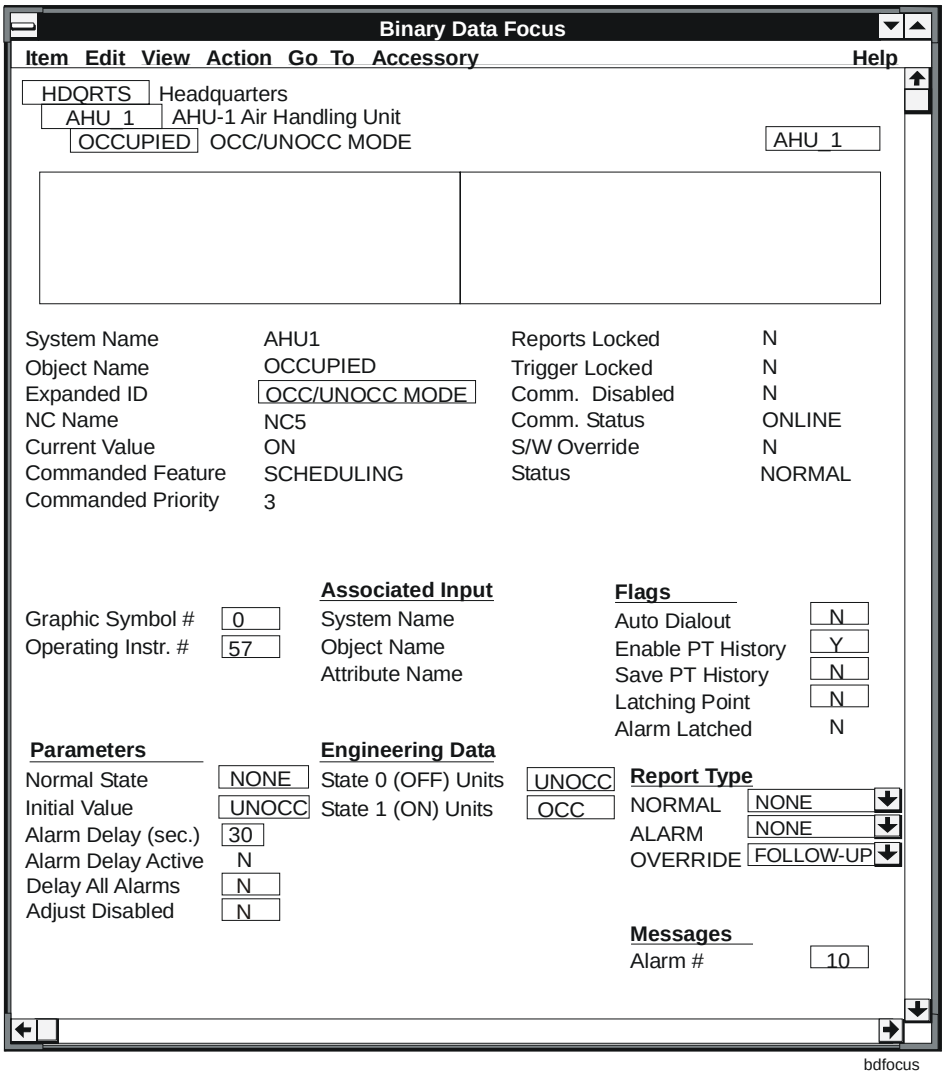

Figure 5: BD Focus Window

Operator Commands

You can command a BD to a specific current value with the Override and Adjust (Set BD) commands. This may be done from an OWS or Network Terminal. The Auto command is used when you want to release the Override command, resuming automatic mode of operation. This allows lower priority inputs to set the BD current value.

Operator commands are executed at the following priorities:

- **Override**: Priority 1
- **Auto**: Priority 1
- Adjust (**Set BD)**: Priority 3

Set BD is actually a generic name for two commands (Override and Adjust) that appear at the OWS Command Action menu and Network Terminal screen. Set BD is visible in both State 0 and State 1 units. If you defined Off as the engineering unit for the BD's State 0 condition and On for its State 1 condition, the Set BD commands will be shown as Off and On.

Note: Set BD can also be issued from a control process, MC, Scheduling, or the Demand Limiting/Load Rolling features. A Scheduled Set BD command is executed at Priority 3. A control process Set BD command is executed at Priorities 2 or 3, depending on the priority level you designate in the process. The Demand Limiting and Load Rolling features execute Set BD commands at Priority 2. Control processes, Scheduling, and Demand Limiting/Load Rolling also use the engineering units, such as On and Off, to issue Set BD commands.

Override Command

An Override command is used when you want total control of the BD object. This prevents other BD inputs, such as control processes and Scheduling, from changing the BD current value. You might decide to execute the Override command when:

- The BD gets an attribute value COS from an associated object that is either offline or connected to defective hardware.
- The BD receives its input from a faulty control process. The process could be faulty if it contains incorrect logic. Another possibility is a control process that has unreliable input variables, resulting from offline or defective hardware.

When an Override Command is Executed

A change resulting from an Override command is always executed immediately. The commanded state becomes the current value, taking priority over all other BD inputs. An Override command will also cancel any alarm delay timing that may be in effect.

While the Binary Data is in an overridden state, the software continues to monitor other inputs to the BD object. The inputs are placed in the priority table as they are received. These inputs do not cause change-of-state reporting or control process triggering. When the Override command is released with the Auto command, the BD object determines which of the inputs has the highest priority. This becomes the BD current value.

Operator Adjust (Set BD) Command

The Adjust (Set BD) command is used when you want to set the current value of the Binary Data object at a lower priority than the Override command. Set BD is useful if you need to alter the current value of the BD to trigger a control process. Unlike the Override command, it does not give you total control of the object. It is executed at Priority 3, which means it can be overwritten by other BD inputs. For example, let's assume you commanded the BD to On with Set BD in order to trigger a control process. A half hour later, Scheduling issues an Off command. Off becomes the current value of the object. This occurs because an incoming Priority 3 input will replace the current Priority 3 input.

When a Set BD Command is Executed

When you issue the Adjust (Set BD) command, the value of this command (e.g., On, Off, Winter, Summer) is sent to the BD Input Prioritization Table. If your command is the highest priority input in the table, it is executed. If it is not the highest priority, the value is held in the table's Priority 3 slot. When Priority Slots 1 and 2 are empty, the Adjust command is executed. An Adjust command cancels any alarm delay timing that may be in effect.

Control Process Inputs

A Binary Data object can receive a command from a control process. Control processes can be created with Graphic Programming Language (GPL) or JC-BASIC. Typically, a control process performs some kind of mathematical calculation or logical operation (with Or, And, If-Then, Compare, or Not logic). The results of the control process can be sent to the Binary Data object with a Set BD or Release command.

Set BD can be user-defined to operate at Priorities 2 or 3. You include the priority level and Boolean state of the Set BD command in the control process. A Boolean state is represented in engineering units like On or Off to signify the State 0 and State 1 values. For example, a Set BD command can cause the current value of a BD to change to On. The value, On, can then be displayed or printed as a BD change-of-state report. This provides the capability of reporting the results of a control process to an OWS or printer.

Application of a Control Process Input to a BD

A control process might be used in a fixed dry bulb economizer mode application, as shown in Figure 6.

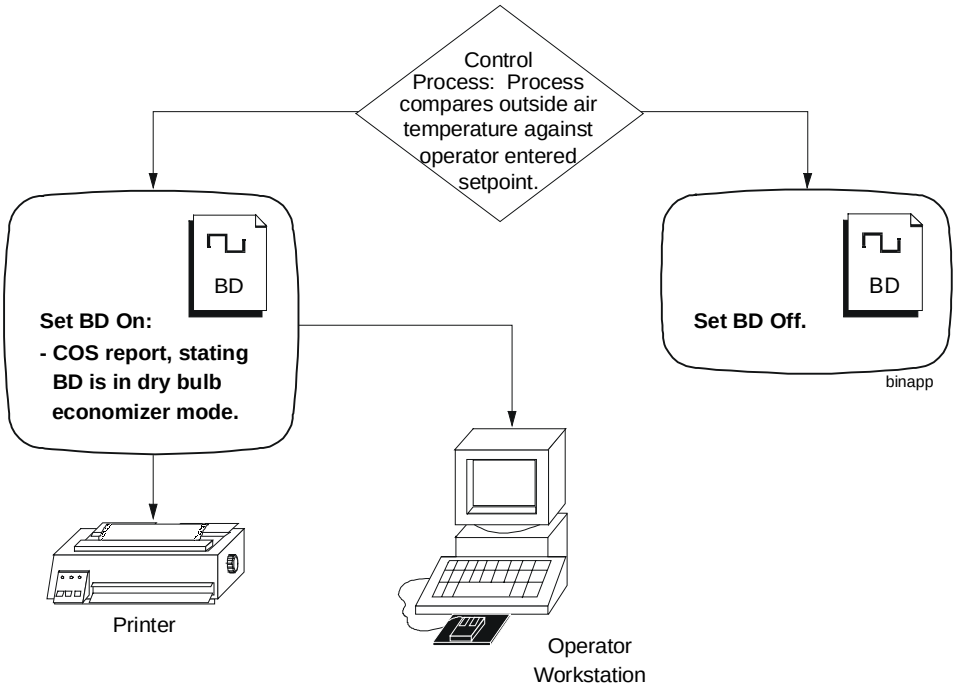

Figure 6: Control Process Used for a Dry Bulb Economizer Application

The process shown above runs every two minutes. This is how it works:

1. The process compares an outside air temperature sensor reading against an operator entered setpoint value.
2. The process sends the results of this comparison to the BD object, using the Set BD command. If the outside air temperature is below setpoint, the control process sets the BD current value to Off. If it's above or at setpoint, the process sets the BD current value to On.
3. The BD object is defined so that a normal report is sent to an OWS and printer when the current value is On. The report specifies that the BD is in the dry bulb economizer mode.
4. In addition, another control process can use the BD current value to determine when to modulate outside air dampers. A change in the BD current value actually triggers this other process to modulate the dampers appropriately.

Refer to the *GPL Programmer's Manual* and *JC-BASIC Programmer's Manual* for details on creating control processes with BD objects.

Associated Object Attribute Inputs

Any Boolean attribute from any object (binary or analog) can be read by a BD object. (Each object technical bulletin contains an attribute table, which lists attribute types, including Boolean). A Boolean attribute is a 0 or 1 logical state that represents a value, such as alarm, normal, on, off, enabled, disabled, yes, or no. Whenever there is a change in the Boolean attribute, the BD reads the new attribute value and places it in its input priority table. The attribute, which has a priority level of 3, becomes the BD current value if it is the highest priority input to the Binary Data object.

Note: The associated input attribute is not valid if the object is mapped to a JC/85/40 software point.

Attributes You Set for this Function

Three attributes affect this Associated Input Function:

- System Name
- Object Name
- Attribute Name

The software needs to know what Boolean object attribute will be read by the BD. You link the object attribute with the BD by setting the three attributes listed above. Once this is done and the BD object is saved, the Binary Data object automatically reads the value of the associated input whenever the value changes state.

Note: If you have defined an associated input for a BD, avoid issuing other Priority 3 inputs to the object. If a Scheduling command or Priority 3 control process command were executed, it would overwrite the value set by the associated input until the associated input changes state again. You can prevent this behavior by disabling the Priority 3 commands (see *Disabling Priority 3 Commands* earlier in this document).

System Name represents the System, such as AHU1, where the associated input object resides. Enter up to eight ASCII alphanumeric characters. There is no default setting.

Object Name represents the associated input object, such as RETFAN, whose attribute will be read by the BD. Enter up to eight ASCII alphanumeric characters. There is no default setting.

Attribute Name represents the attribute, such as current value, which the BD reads as its associated input. Enter the attribute's software name (e.g., VALUE is the software name for current value). See the attribute table at the end of the associated input object's technical bulletin for attribute software names.

An Application of an Associated Input to a BD

An associated input could be used in a mixed air, single path fan system with dual supply fans, and a common return fan. One supply fan is in AHU1, while the other supply fan is in AHU2. The common return fan is in AHU1. You might want to see the return fan's status in each supply fan's system summary. This can be achieved by creating a BD object that reads the current value attribute from the actual return fan (whenever it changes state). The return fan is defined as a binary input object with the name, AHU1\RETFAN. The Binary Data object is named AHU2\RETFAN so that you can view the return fan's status in the AHU2 system summary.

Scheduling Commands

Scheduling can also send a command to a BD object. Scheduling issues a Set BD command, which changes the BD current value at Priority 3. Scheduling commands are created at the Scheduling feature window, where you specify the Set BD command in engineering units, such as Occup (Occupied) or Unocc (Unoccupied). You also set the time when you want the command to be issued. For example, you could designate that Scheduling execute an Occup (Set BD) command at 8:00, and an Unocc (another Set BD) command at 17:00.

An Application of a Scheduling Input to a BD

Scheduling might be used with the BD object to trigger a control process. For example:

1. Scheduling sends a Set BD command (of State 1, Occup) to a Binary Data object at 8:00. At 17:00, it sends another Set BD command (State 0, Unocc) to the Binary Data object.
2. When the BD current value is Occup, it can trigger two control processes. Control Process 1 sequences on a number of fans. Control Process 2 opens a minimum outside air damper.
3. When the BD current value is Unocc, it can trigger these same two control processes to perform different control strategies. Control Process 1 turns off the fans, while Control Process 2 closes the minimum outside air damper.

Demand Limiting/Load Rolling Commands

The Demand Limiting and Load Rolling (DLLR) features can also send a command to a BD object. DLLR issues a Shed or Restore command. A Shed command is actually a Set BD (State 0) command at Priority 2. A Restore command acts like a Release command, clearing any command at Priority 2.

For more information on using a BD with the DLLR feature, see the *Demand Limiting/Load Rolling Technical Bulletin (LIT-636106)*.

Current Value

As stated earlier, the BD current value is derived from the input prioritization process.

Notes: Until the BD polls the associated input value (this happens within 30 seconds of a change), the current value displayed on the BD Object Focus window and the value displayed on summaries reflect the value at the time of the last poll. Once the associated input value is polled, the current value updates to the associated object's attribute value.

In the case of BDs, for up to 30 seconds, the value shown on the standard summaries may be a commanded value instead of the associated object's attribute value. This may be undesirable for some applications, so the BD provides the Adjust Disabled attribute, which can be set to Yes to disable the Priority 3 commands (see *Disabling Priority 3 Commands* earlier in this document).

Attributes Associated with the Current Value

Three Current Value attributes are associated with the current value:

- Current Value
- State 0 (Off) Units
- State 1 (On) Units

Current Value is the attribute that represents the present condition of the object, such as Occup. This attribute is not definable.

State 0 (Off) Units represent the false BD value. The default setting is Off.

State 1 (On) Units represent the true BD value. The default setting is On.

Enter up to six ASCII alphanumeric characters for each of the units above. Examples include On/Off, Occup/Unocc, Winter/Summer, Clean/Dirty, and so on.

The BD current value is displayed as one of these two engineering units (e.g., Occup or Unocc) at the BD Focus window, NT screen, and object summaries. These units are also used in commands initiated by an operator, Scheduling, Demand Limiting/Load Rolling, or control process.

BD Alarm Analysis

Figure 7 is a flow diagram of BD alarm analysis. The blocks represent software functions. The dashed boxes represent the attributes that define or control the functions.

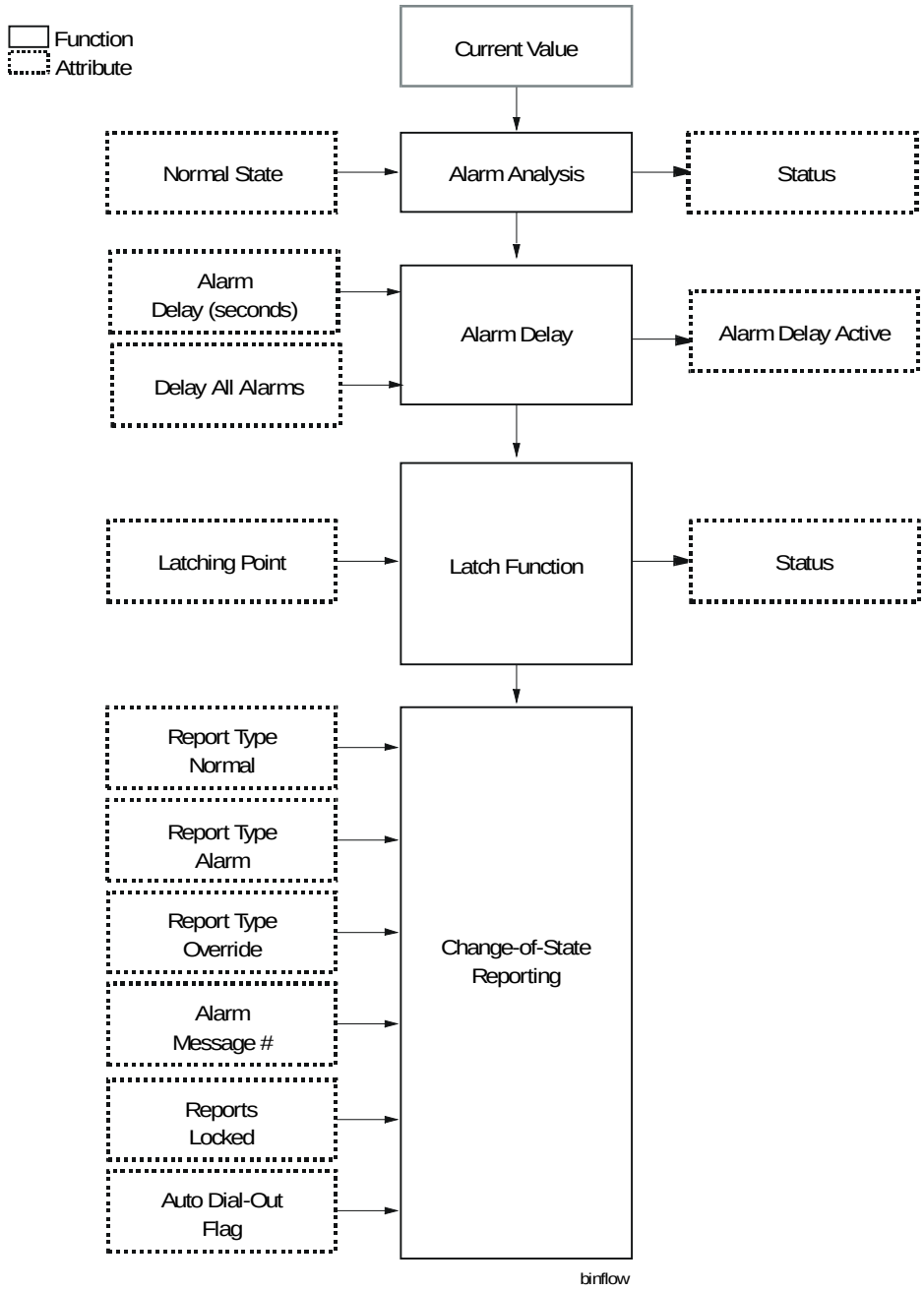

Figure 7: BD Alarm Analysis Functional Flow

Alarm Analysis

Alarm analysis is a software process that compares the BD current value against a user-defined normal state attribute. The purpose of alarm analysis is to determine the BD status. The status can be:

- **Normal**--The BD current value matches what has been user-defined as normal.
- **Alarm**--The BD current value doesn't match what has been user-defined as normal.

Attributes You Set for Alarm Analysis

The Normal State attribute affects alarm analysis:

Normal State specifies the current value that you consider normal. For example you could set this attribute to None (the default setting), On, or Off. Acceptable entries are explained below.

- State 0 (Off) or State 1 (On) Units--Remember that you set two attributes--State 0 and State 1--that defined the two possible conditions of the BD object. Possibly you named them Occup and Unocc. Now you are specifying which of these conditions is normal. This creates two possible logical states for the BD (alarm or normal).
- None--This means the BD is a status-only object. Although the current contact value, such as Occup and Unocc, is reported to operator devices, alarm analysis is not performed. The status is always shown as normal in the Focus Window and on summaries.

Application Example of the Normal State

A BD object could be used in a control process to combine the status of a number of BI objects. For example, five BI objects could each monitor the low limit sensor of five fans. The process contains logic that changes the BD status to alarm when one or more of the low limit BI objects goes into alarm. This is done by:

1. Setting the BD State 0 Units to Freeze, the State 1 Units to normal, and the Normal State to normal.
2. When one or more of the BI objects goes into alarm, the BD current value changes to Freeze.
3. Alarm analysis compares this condition (Freeze) against what you defined as normal. You specified normal as normal. These values don't match, so the BD status changes to alarm.

When Alarm Analysis Occurs

Alarm analysis begins when:

- The current value changes due to a new input from an operator command, control process, object attribute, or Scheduling.
- You modify the BD Normal State attribute at a BD Focus window, through an associated BO object, or within a control process.

Note: An associated BO changes the BD Normal State when the Binary Data is used as feedback for the binary output. This is explained later.

Alarm Delay

This function delays alarm reporting of the BD object for a user-specified period of time. The purpose of the alarm delay is to prevent nuisance reports that could result from a BD current value change when the BD object is used as feedback for a Binary Output object or when mapped to an associated input object that is monitoring a flutter contact. The alarm delay timer is started when the BD Normal State attribute is modified by an associated BO object. The BO automatically changes the Normal State attribute of the BD object when the BD is defined as feedback for the BO. When the Delay All Alarms attribute is set, the alarm delay timer is started whenever the current value of the associated input object changes from the normal to the alarm state except when caused by a command to the BD object.

Attributes You Set for Alarm Delay

The Alarm Delay (sec) attribute affects alarm delay time:

Alarm Delay specifies the time that the software will wait before issuing an alarm COS report. You can designate a delay time of 0 to 255 seconds, with 0 representing no delay. The default setting is 30 seconds.

Note: If you are mapping the BD to a JC/85/40 BIN software point, the BD Alarm Delay value must be equal to zero. If you are mapping the BD to a JC/85/40 SST or OPN/CLO software point, the BD Alarm Delay value must be other than zero.

Delay All Alarms specifies if the alarm delay function should be active for all COS transitions from the normal to the alarm state except those caused by a command to the BD object.

Alarm Delay Active

Alarm Delay Active is an output flag indicating the delay timer is running. Since this is not a configuration parameter, the user cannot change it.

Application Example of Alarm Delay

An application for alarm delay is shown in Figure 8. The BD object has been defined with an alarm delay time of 15 seconds.

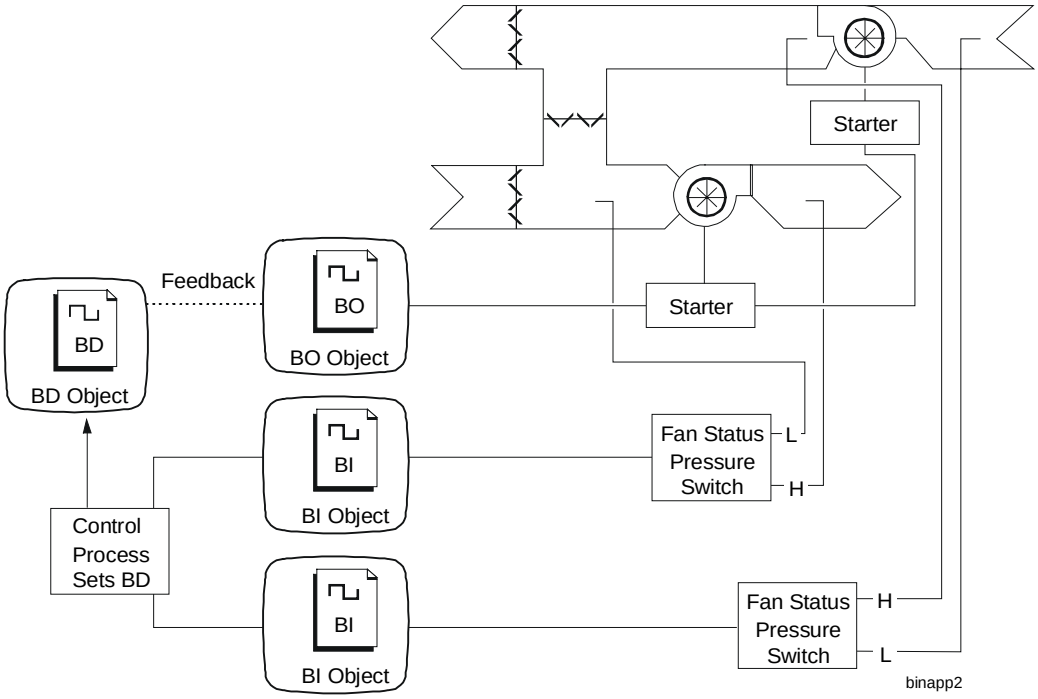

Figure 8: Application of BD Alarm Delay

Figure 8 shows a BD that's used in a control process to provide feedback for two fans. This is how it works:

1. The supply fan starter is defined as a BO object. The return fan is hardware wired to the supply fan, but not defined as a separate object. When the BO object is commanded to Start, the supply and return fans should start simultaneously.
2. When this BO was defined, Feedback attributes were specified. These attributes represent the Binary Data object that's used in the control process.
3. The supply fan and return fan each have an air flow switch—two separate BI objects. The BI switches monitor for air flow from the fans.
4. The binary output is commanded to Start the fan. When this happens several events occur:
    a. The BD receives a new normal state value from the BO. The normal state is generally defined as Off. The BO now changes it to On (i.e., it's expected that the BD will be On, meaning there will be air flow, when the BO is commanded to start).

b. When the BO sends out the new BD normal state, the BD alarm delay timer starts. If the timer wasn't started, the Binary Data object would immediately go into alarm.

c. If one or both of the BI switches detect air flow, a control process is triggered.

d. The control process contains logic that sets the BD to On if both BIs are On (both are detecting air flow). The BD is set to Off if one or both BIs are off (one or both don't detect air flow).

e. After the alarm delay times out--say, 15 seconds--the current value of the BD is read by the software. The current value is compared to the BD normal state.

f. If the BD current value is On, air is flowing from both fans, and the BD status is considered normal. If the BD current value is Off, one or both fans is not causing air flow, and the BD is in alarm.

Latch Function

Latching is an optional function that causes the BD object to stay in alarm once it changes to an alarm condition. The purpose of latching is to ensure that BD alarm changes are acted upon by an operator or control process before the object returns to a normal state.

Note: If a normal state isn't defined for the BD, the object can't go into alarm. (It's a status-only object.) Under these conditions, the Latch function has no meaning and is not operational.

Attributes You Set for the Latch Function

The Latching Point attribute affects latching:

Latching Point--Enter Y (yes) to make the BD object a latching point, or N (no) to not make it a latching point. The default setting is N (no).

How does the Latch Function Work?

If you define a BD object as a latching point, the following occurs:

- The Status attribute is locked (latched) into alarm.

  Note: This also means that the hidden attributes--Normal Status and Alarm Status--are locked. The Normal Status attribute is set to false and the Alarm Status attribute is set to true. These two attributes are considered hidden because they do not appear at the BD Object Focus or Definition windows. Normal Status and Alarm Status are mentioned here because this information may be helpful for troubleshooting or control process programming.

- Commands and associated inputs don't alter the BD Status, Normal Status, and Alarm Status attributes.
- The current value continues to update.
- No further alarm analysis is performed.

Unlatch Command

Only an Unlatch command from an operator or control process can release the latched state. You can issue an Unlatch command at any time. However, the object's status will not return to normal until the current value changes to what is defined as normal. See Figure 9. When a BD object is Unlatched, the following occurs:

- The Status, Normal Status, and Alarm Status attributes are unlocked. Commands and associated inputs can alter the value of these BD attributes.
- Alarm analysis resumes.

Figure 9 below visually describes how the Latch function works.

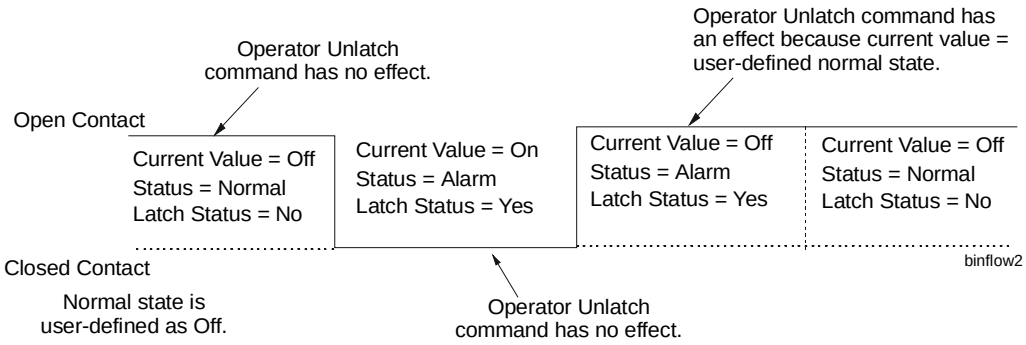

Figure 9: Timing Diagram of the Latch Function

COS Reporting

A detailed explanation of Change-of-State (COS) reporting is contained in the *Report Router/Alarm Management Technical Bulletin (LIT-636114)*, under the *Feature Software* tab, later in this manual. A brief discussion of this topic follows.

When the status (alarm, normal, or override) of a BD object changes, a COS report can be sent to one or more devices, including an OWS, NCM printer, Workstation printer, and OWS files.

Attributes You Set for COS Reporting

Six attributes affect COS reporting:

- Report Type Normal
- Report Type Alarm
- Report Type Override
- Alarm Message #
- Reports Locked
- Auto Dial-Out

Report Type Normal represents the COS report that's generated when the BD's status changes to normal. Acceptable entries for this attribute and the other report types are explained below.

Report Type Alarm represents the COS report that's generated when the BD's status changes to alarm.

Report Type Override represents the COS report that's generated when you've set the BD current value with the Override command.

For each of the three report types above you can specify:

- None (default setting)
- Crit1
- Crit2
- Crit3
- Crit4
- Follow-Up
- Status

Note: For information on report destinations (e.g., PC, printer, print file), see *Report Router/Alarm Management Technical Bulletin (LIT-636114).*

Alarm Message # is a user-defined reference number (0 to 225) that identifies the particular text to be included with an alarm COS report. The text is displayed in the dialog box of a critical alarm report. The default, 0, doesn't associate an alarm message with an alarm COS.

Reports Locked specifies whether or not (Y or N) the object sends COS reports to operator devices. You can stop and start reports using the Lock Reports and Unlock Reports commands. The Reports Locked attribute merely signifies which command is currently in effect.

Auto Dial-Out specifies whether or not (Y or N) critical reports (Crit1-Crit4) force a dialout to a remote OWS. Set this attribute to Y to enable auto dialout, and N to disable auto dialout. The default setting is N.

Triggers and History

Figure 10 is a flow diagram of BD control processing triggering and historical data gathering/archiving. The blocks represent software functions. The dashed boxes represent attributes that define or control the functions.

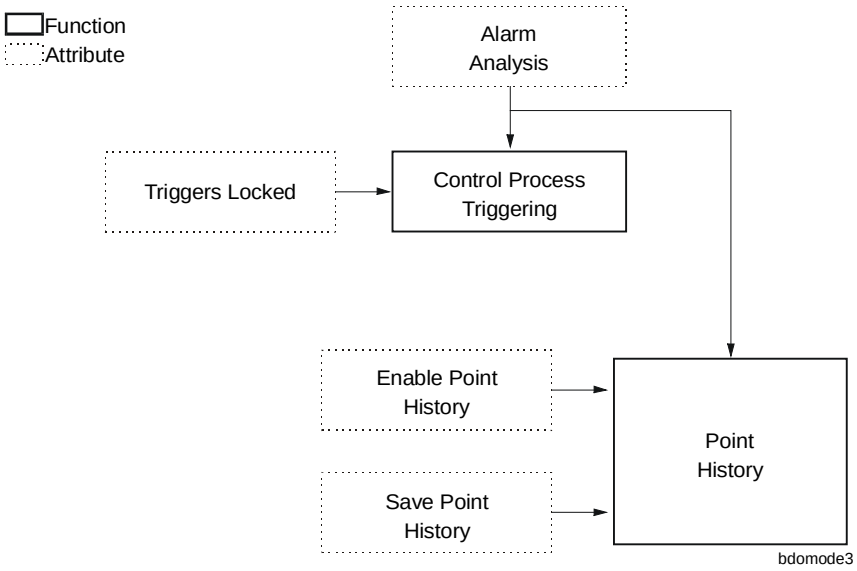

Figure 10: BD Triggers and History Functional Flow

Control Process Triggering

Certain attributes of the BD object can trigger a control process. This means that when the value of a BD triggering attribute changes, this change can cause a control process to run.

BD Attributes That Can Trigger a Control Process

Six BD attributes can cause a control process to run:

- Offline
- Status
- Normal Status
- Alarm Status
- Current Value
- Display ASCII Representation Value

Any of these attributes may be referenced within a control process. For example, a BD object might represent a Summer/Winter mode select. When the BD current value changes to winter, it can trigger (cause) a control process to run. This process might switch a single coil fan unit between a heating circuit and a cooling circuit. For further information on triggers, refer to the *JC-BASIC Programmer's Manual* and *GPL Programmer's Manual.*

Attributes You Set for Triggering Control Processes

One attribute affects Triggering Control Processes:

Triggers Locked specifies whether or not (Y or N) the object can trigger a control process. Triggers can be stopped and started using the Lock Triggers and Unlock Triggers commands. The Triggers Locked attribute signifies which command is currently in effect.

Point History

The Point History feature samples, displays, and archives certain attributes associated with the BD object. Samples are temporarily stored in a point history record at the Network Control Module where the BD is defined. This record is automatically added when the object is added and deleted when the object is deleted. The record is of a fixed size. It will hold the last ten history samples for a specific BD object. Once filled, the oldest data is replaced with the newest samples. Information in this record can be automatically sent to an OWS for long-term storage.

The following attribute samples are taken for a BD whenever one of these values changes. The time and date of each change is also saved.

- Current Value
- Status
- Commanded Feature
- S/W Override
- Comm. Disabled
- Offline

Attributes You Set for Point History

Two attributes affect Point History:

- Enable Point History
- Save Point History

Enable Point History--If you specify Y (yes) for this attribute, historical information is automatically collected at the NCM for this BD object. This begins as soon as the object is defined. The default for this attribute is N. If N (no) is selected, samples are not gathered.

Save Point History--If you specify Y (yes) for this attribute, historical information for the BD is automatically sent from the NCM to an archive file on an OWS. If no (the default), the information is only buffered at the NCM (and will be overwritten with new data when the file fills up). This attribute is only valid if the Enable PT History attribute is Y (yes).

Unreliable and Communication Status

Unreliable Status

The Binary Data object may become unreliable when:

- Its highest priority input value is unreliable.
- The BD reads an unreliable attribute from an associated input object.
- The BD receives its input from a faulty control process. The process could be faulty if it contains incorrect logic. Another possibility is a control process that has unreliable input variables, resulting from offline or defective hardware.

When the BD object is unreliable, the following attributes that are derived from its input value also become unreliable:

- Current Value (Boolean)
- Status
- Display ASCII Representation Value *
- Normal Status *
- Alarm Status *

* These attributes are hidden. They do not appear as fields at the BD Object Focus window or NT display. However, you might use them in control process programming. Keep in mind that if these attributes become unreliable, they can affect the results of the control process. See Table 7 at the end of this document for additional information on these attributes.

Communication Status

The Comm. Status field in the object Focus window is used for the Online/Offline status.

The BD is considered offline if the BD samples an attribute from an associated input object, and the input object's NCM is offline. If an object is offline, `OFFLINE` appears in the Comm. Status field of the object's Focus window. In addition, the offline object appears in the Offline summary.

When a BD is Unreliable or Offline

You can determine if a BD is unreliable by looking at its Focus window or any summary containing information about the object. When the object is unreliable, the current value and Status attributes will display ???? (question marks) rather than a value in the BD Focus window and on summaries.

If a BD object is offline, it will appear in the Offline summary. In addition, the Object Focus window will specifically tell you if the BD is offline in the Comm. Status field. Figure 11 shows a Focus window for a Binary Data object that is offline and unreliable.

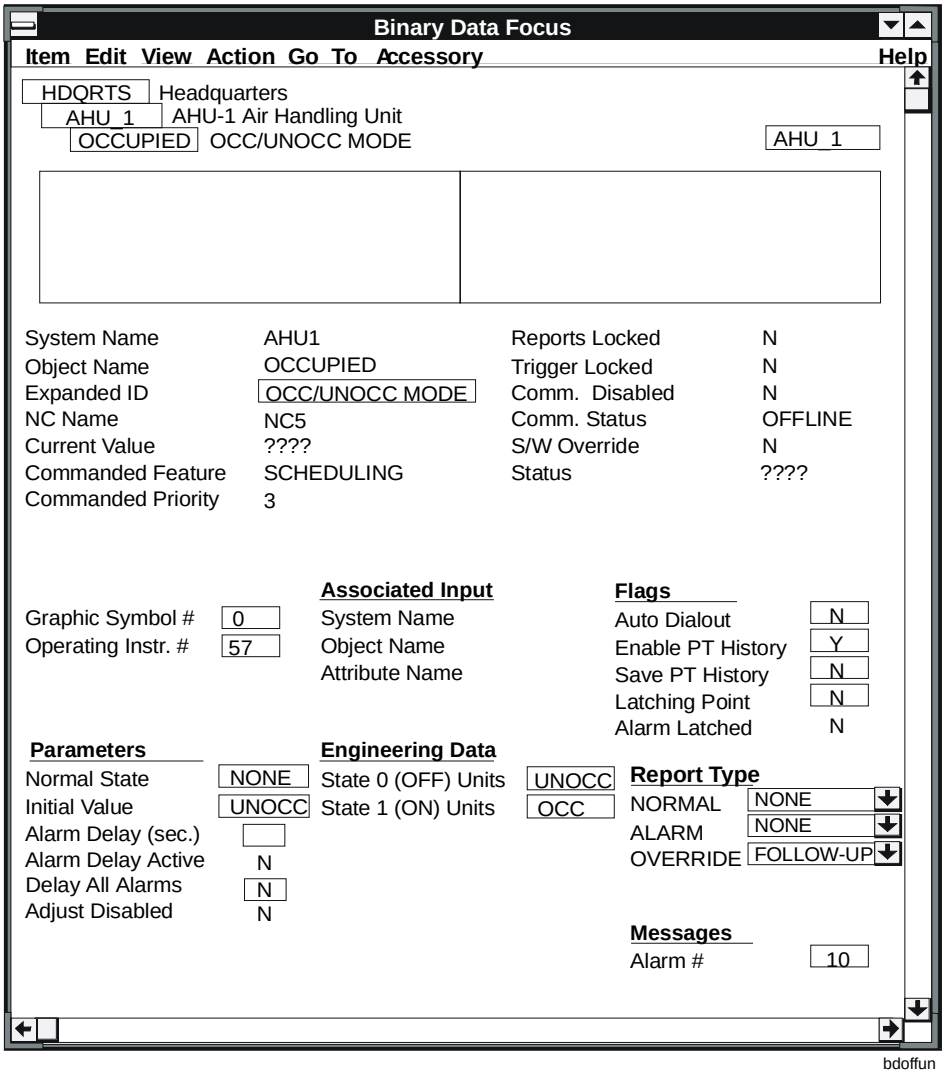

Figure 11: Focus Window of an Offline, Unreliable BD Object

Reference Tables

BD Attribute Table

Table 7 lists the attributes of the Binary Data object. This page contains a description of terms used in the table.

S/W Name — Column Heading. (Software name) The name of each attribute as it is recognized by the Metasys software.

PMI Label — Column Heading. The name of each attribute field as it is appears in the Metasys windows and dialog boxes.

Description — Column Heading. A definition of each attribute.

Type/Range — Column Heading. Type of characters used and definition limits. (Integer has a set range of numbers that can be used. Boolean calls for either a 0 or 1. String can be a mixture of numbers and text.

- String — ASCII alphanumeric characters, such as System/Object name
- Boolean — 0 or 1, with 0 and 1 representing logical states, such as true and false
- Integer — Whole numbers from -32767 to +32767, such as 22
- Floating point — Values that contain decimal points, such as 67.5

Code/Default Value — Column Heading. The default value for each attribute (in brackets) if a default value exists. The meaning of each value may also be given. The Code/Default Value column shows numbers and ASCII text. The numbers are used when defining the object in DDL, and the ASCII text is used when defining the object online or through GPL.

For example: 0 = N = unlatched
where:
0 is used in DDL
N is used in GPL and online

- [ ] — Default. The value in brackets appears in the attribute field when you first enter the Object Definition window. This remains the attribute value until you change it.

Usage — Column Heading. Lists possible uses for each attribute. The following eight items are uses listed within the Usage column:

- Definable — Means that you can set a value for the attribute, using the Data Definition Language (DDL), Graphic Programming Language (GPL), or online Object Definition window. You designate attribute values when defining the object.
- Writable — Means you can modify the attribute, using the Object Focus window or GPL Template.
- Object Default — A timesaving function used in JC-BASIC programming. Allows you to omit the attribute name when writing the logic. When omitted, the attribute name is assumed by the program.
- JC-B Writable — Means a JC-BASIC process can modify (write to) an attribute.
- Triggerable — Means the attribute can cause (trigger) a control process.
- Range Check — Means the software verifies that JC-BASIC has correctly written to (modified) the attribute.
- GPL Menu — Means the attribute is available in the GPL process Connection menu.
- PMI — Means the attribute value is shown in the Object Focus window.

Table 7: Binary Data Object Attributes

Attribute		Description	Type/ Range	Code/ [Default Value]	Usage
Software Name	**PMI Label**				
ADJ_DIS	Adjust Disabled	Specifies whether or not (Yes or No) Priority 3 Adjust commands (Set BD) are disabled. Disabling adjust commands allows the associated input object to have sole control of the BD's value at Priority 3.	Boolean/ 0 or 1	0= [No = enabled] 1= Yes = disabled	Definable
ALR_MSG	Alarm Message #	A user-defined reference number that identifies the particular text to be included with an alarm COS report. The text is displayed in the dialog box of a critical alarm report.	integer/ 0 to 255	[0=none]	JC-B Writable, Definable, Range Check, Writable
ALARM	Alarm Status	Specifies whether or not (True or False) the status of the object is alarm. If alarm analysis sets this attribute to true, the object focus window displays a status of Alarm. If this attribute is set to false, the object focus window displays a status of Normal.	Boolean/ 0 or 1	0=false 1=true	GPL Menu, Triggerable
ALR_GEN	Delay all Alarms	Specifies whether or not (Yes or No) the alarm delay feature should be active for all COS transitions from the normal to the alarm state except those caused by a command to an object.	Boolean/ 0 or 1	0= [No] 1= Yes	JC-B Writable, Definable, Writable
ALR_RPT	Report Type Alarm	Specifies the type of COS report that's generated when the status changes to alarm.	integer/ 0 to 6	[0=no report] 1=critical 1 2=critical 2 3=critical 3 4=critical 4 5=follow-up 6=status	JC-B Writable, Definable, Range Check, Writable
ASS_ATTR	Associated Input Attribute Name	The name of the attribute, such as VALUE, that the BD object reads whenever the value changes state. The read attribute value becomes the BD Current Value if it is the highest priority input to the object. Note: This attribute is not valid for objects mapped to JC/85/40 points.	integer/ 0 to 32767	[0 = none]	Definable
ASS_OBJ	Associated Input Object Name	The name of the object, such as RETFAN, whose attribute the BD object reads. Note: This attribute is not valid for objects mapped to JC/85/40 points.	string/ 8 char. max.	[blank = none]	Definable

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Attribute (Cont.)		Description	Type/ Range	Code/ [Default Value]	Usage
Software Name	**PMI Label**				
CMD_PRI	Command Priority	Identifies the priority level of the Commanded Feature. The Commanded Feature is responsible for the object's Current Value or Commanded Value.	integer/ 1 to 3	[3]	
CNTL_FEA	Controlling Feature	Name of the feature currently controlling the load, either Demand Limiting or Load Rolling. If neither, NONE is displayed.	Boolean/ 0 or 1	0=Demand Limiting 1=Load Rolling	PMI
COS_DEL	Alarm Delay Active	Specifies whether or not (Y or N) the alarm delay function is currently active.	Boolean/ 0 or 1	[0=inactive] active	Triggerable
DELAY	Alarm Delay Time (secs)	The period that the BD object will wait before reporting an alarm. The delay is useful in preventing nuisance alarms when the BD object is used as a feedback to a BO object or is mapped to an object monitoring an unreliable or flutter contact. For BD mapped to JC/85/40 BIN points, Alarm Delay must equal zero. For BD mapped to JC/85/40 SST or OPN/CLO points, Alarm Delay must be other than zero.	integer/ 0 to 255	[30]	JC-B Writable, Definable, Writable
DIAL_UP	Auto Dial-Out	Specifies whether or not (Y or N) critical reports (Crit1-Crit4) force a dialup to a remote OWS.	Boolean/ 0 or 1	[0=no] 1=yes	JC-B Writable, Definable, Writable
DISPLAY	ASCII Representa-tion Value	The object Current or Commanded Value converted to ASCII text for PMI display.	string/ 8 char. max.		PMI Display Triggerable (BD and BI only)
EARLY_TM	Early Start Time	The time of the earliest scheduled SET_BD command for the day that commands the BD to State 1 (the earliest start time for this BD object).	time		GPL Menu
FEATURE	Commanded Feature	Identifies the source of the object's Current Value or Commanded Value. Besides features, sources can be the operator or a control process. Sources are listed in the Code/Default column to the right. Initial = Initial Value attribute, and Shared = associated input attribute.	integer	1=Operator 2=Scheduling 3=Process 4=Demand 5=Load Roll [6=Initial] except AOD [7=DCM] (AOD) 8=Override 14=Shared 19=Multiple Cmd	
Continued on next page . . .					

Attribute (Cont.)		Description	Type/ Range	Code/ [Default Value]	Usage
Software Name	**PMI Label**				
ASS_SYST	Associated Input System Name	The name of the system, such as AHU1, which contains the associated input object. Note: This attribute is not valid for objects mapped to JC/85/40 points.	string/ 8 char. max.	[blank = none]	Definable
GRAPHIC	Graphic Symbol #	A reference number that identifies the particular graphic symbol used to represent the object in OWS graphic summaries. A value of zero means no graphic will be displayed.	integer/ 0 to 32767	[0=none]	JC-B Writable, Definable, Writable, Range Check
HISTORY	Enable PT History	Specifies whether or not (Y or N) historical information is automatically collected at the NCM for this object. This collection begins as soon as the object is defined.	Boolean/ 0 or 1	[0=no] 1=yes	Definable, Writable
INITIAL	Initial Value	A Commanded Value with a priority = 3. Initial Value provides a command source when no other sources are present. For PIDL objects, Initial Value provides an alternative to the value of the referenced object.	BO, BD: Boolean/ 0 or 1	BO, BD: [0=State 0=stop] 1=State 1=start	Definable, Writable
INSTRUCT	Operating Instruction	A reference number that identifies the particular text provided when Help is requested at the OWS. A value of zero means no message will be displayed.	integer/ to 32767	[0=none]	JC-B Writable, Definable, Range Check, Writable
LATCH	Latch Status	Specifies whether or not (Y or N) the object is presently latched into alarm.	Boolean/ 0 or 1	[0=N=unlatched] 1=Y=latched	GPL Menu
LATCHING	Latching Point	Specifies whether or not (Y or N) the object is defined as a latching point. If it is, the object will remain in alarm once it changes to an alarm state. Only an operator Unlatch command can unlock the alarm state. Note: When the object is mapped to a JC/85/40 BIN point, only specifiy latching at one end (Metasys) or the other (JC/85/40), not both.	Boolean/ 0 or 1	[0=no] 1=yes	Definable, Writable
LATE_TM	Latest Stop Time	The time of the latest scheduled SET_BD command for the day that commands the BD to State 0 (the latest stop time for this BD object).	time		GPL Menu

Continued on next page . . .

Attribute (Cont.)		Description	Type/ Range	Code/ [Default Value]	Usage
Software Name	**PMI Label**				
LMIN_OFF	Minimum Shed Time	Time period, in minutes, that this load will be off, once it is shed by Demand Limiting. Minimum Shed Time is used only if it is required by Comfort Override.	integer/ 0 to 255	n = time in min. [0]	JC-B Writable, Definable, Writable
LMIN_ON	Minimum Release Time	Time period, in minutes, that this load will be left released by Demand Limiting, once it has been restored.	integer/ 0 to 255	n = time in min. [1]	JC-B Writable, Definable, Writable
LOAD_PRI	Load Priority	The priority (1 to 4) with which the load is to be shed. Shed candidates for Load Rolling must be Priority 3. Shed candidates for Demand Limiting can be any priority from 1 to 4.	Integer/ 1 to 4	1=highest priority; these loads shed only as last resort to meet DL target. 4=lowest priority; these loads shed first by DL.	Definable
LOCK	Load Locked	Flag indicating whether or not (Y or N) the load controlled by the object is temporarily inhibited from being a Demand Limiting shed candidate.	Boolean/ 0 or 1	[0 = unlock] 1 = lock	Definable
LSTATUS	Load Status	Flag indicating whether the load controlled by this object is currently shed (under Demand Limiting feature), or released.	Boolean/ 0 or 1	0 = released 1 = shed	
MAX_OFF	Maximum Shed Time	The time period, in minutes, that this load will normally be off, once it is shed by Demand Limiting. An alternate setting, Minimum Shed Time is used only if required by Comfort Override.	integer/ 1 to 255	n = time in min [60]	JC-B Writable, Definable, Writable
NAME	Expanded ID	An expanded version of the object name that more clearly identifies the object. For example, Outside Air Temp. for OAT. It appears at the Object Focus window, GPL template, and summaries.	string/ 24 char. max.		Defined, Writable
NC_NAME	NCM Name	Specifies the NCM that this object is defined on.	string/ 8 char. max.		

Continued on next page . . .

Attribute (Cont.)		Description	Type/ Range	Code/ [Default Value]	Usage
Software Name	**PMI Label**				
NOR_COND	Normal State	Specifies a user-defined normal contact value, such as On or Off. Alarm analysis compares the Current Value against the Normal State to determine the object's status. If these values match, the object COS is reported as normal. If they don't match, the object COS is reported as alarm. Specifying a Normal State of None creates a status-only object, one that does not perform alarm analysis. Note: When the object is mapped to a JC/85/40 SST or OPN/CLO point, the COS message from the JC/85/40 will update the NOR_COND attribute.	integer/ 0 to 3	[0=none/status only] 1=open/state 0 2=closed/state 1	JC-B Writable, Definable, Range Check, Writable
NORMAL	Normal Status	Specifies whether or not (True or False) the status of the object is normal. If alarm analysis sets this attribute to true, the focus window displays a status of Normal.	Boolean/ 0 or 1	0=false 1=true	GPL Menu, Triggerable
NOR_RPT	Report Type Normal	Specifies the type of COS report that's generated when the status changes to normal.	Integer/ 0 or 6	[0=no report] 1=critical 1 2=critical 2 3=critical 3 4=critical 4 5=follow-up 6=status	JC-B Writable, Definable, Range Check, Writable
OBJECT	Object Name	Defines the object such as AIR_FLOW (for air flow switch). The object name cannot already exist under the given system name. Note: If you are mapping the BD to a JC/85/40 software point, the object name must contain the JC/85/40 System Type, Point Type, and the Level 3 name separated by an underscore. For example, HBIN_STA.	string/ 8 char. max.		Definable
OFFLINE	Comm. Status	Specifies whether the object is offline or online. A BD object is considered offline when the NCM for the associated input attribute is offline.	Boolean/ 0 or 1	0=Online 1=Offline	GPL Menu, Triggerable

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Attribute (Cont.)		Description	Type/ Range	Code/ [Default Value]	Usage
Software Name	**PMI Label**				
OVERRIDE	S/W Override	Specifies whether or not (Y or N) the object is currently in an overridden state due to an operator Override command.	Boolean/ 0 or 1	[0=no] 1=yes=override	GPL Menu
OVR_RPT	Report Type Override	Specifies the type of COS report that's generated when you have set the current value with the Override command, or issued an Auto command.	integer/ 0 to 6	[0=no report] 1=critical 1 2=critical 2 3=critical 3 4=critical 4 5=follow-up 6=status	JC-B Writable, Definable, Range Check, Writable
OV_OBEJCT	Comfort Override Object Name	The name of the object whose COS status can cause the Demand Limiting feature to release this load at the Minimum Shed Time.	String/ 8 char. max.		Definable
OV_SYSTEM	Comfort Override System Name	The name of the system containing the Comfort Override Object used by the Demand Limiting Feature.	String/ 8 char. max.		Definable
PREFIX	* Condition	NT only. Flag indicating whether the object is offline, overridden, trigger locked, report locked, disabled, or has a feedback problem. The * appears before the BD object name.	Boolean/ 0 or 1	[0 = no] 1 = yes	PMI
RATE	Load Rating State_1	The savings realized when the load controlled by this object is switched from State_1 to Off by the Demand Limiting feature.	float pt.		Definable
REL_LEFT	Release Time Left	Used by the DL/LR feature to count down the time until shedding is allowed.	integer/ 0 to 255		
REPORT	Reports Locked	Specifies whether or not (Y or N) the object sends COS reports to operator devices. Reports can be stopped and started using the Lock Reports and Unlock Reports commands. The Reports Locked attribute merely signifies which command is currently in effect.	Boolean/ 0 or 1	[0=N=unlocked] 1=Y=locked	

Continued on next page . . .

Attribute (Cont.)		Description	Type/ Range	Code/ [Default Value]	Usage
Software Name	**PMI Label**				
SAVE_HIS	Save PT History	Specifies whether or not (Y or N) historical information for the object is automatically sent from the NCM to an archive file on an OWS. If N is selected, the information is only buffered at the NCM, and will be overwritten with new data when the file fills up.	Boolean/ 0 or 1	[0=no] 1=yes	Definable, Writable
SCAN	Comm Disabled	Specifies whether or not (Y or N) communication is disabled between the object and its associated controller (DCM or XM). When an object is Comm Disabled, it can't trigger control processes, send COS reports to operator devices, or accept commands (except for Enable). Comm Disable attribute also signifies whether the Comm Enable or Comm Disable command is in effect.	Boolean/ 0 or 1	[0=N=enabled] 1=Y=disabled	Definable
SHD_LEFT	Shed Time Left	Used by the DL/LR feature to count down the time until the load will be released.	integer/ 0 to 255		
STATDISP	Status Prefix	Prefix specifying the current status of the object: offline, overridden, trigger locked, report locked, disabled, etc. The prefix appears before the object name in summaries. No prefix indicates normal status.	integer/ 0 to 17	[0=blank,normal] 2=RPT,reports locked 3=TRG,triggers locked 9=ALM,alarm 10=SWO,s/w override 12=DIS,disabled 14=UNR, unreliable 15=OFF,offline	PMI Triggerable
STATUS	Status	Reflects the results of alarm analysis.	integer/ 0 or 2	0=normal 2=alarm	Triggerable
SYSTEM	System Name	The name of an existing system in the network, such as AHU1.	string/ 8 char. max.		Definable (PMI default: Current system at Definition Window)
Continued on next page . . .					

Attribute (Cont.)		Description	Type/ Range	Code/ [Default Value]	Usage
Software Name	**PMI Label**				
TRIGGER	Trigger Locked	Specifies whether or not (Y or N) the object can trigger control processes. Triggers can be stopped and started using the Lock Trigger and Unlock Trigger commands. The Trigger Locked attribute merely signifies which command is currently in effect.	Boolean/ 0 or 1	[0=N=unlocked] 1=Y=locked	
UNIT_0	Status Units State 0	State 0 (Off) Units are ASCII alphanumeric characters that represent the open contact condition.	string/ 6 char. max.	[OFF]	Definable, Writable
UNIT_1	Status Units State 1	State 1 (On) Units are ASCII alphanumeric characters that represent the closed contact condition.	string/ 6 char. max.	[ON]	Definable, Writable
VALUE	Current Value	Represents the present condition of the object, such as On or Off. This value is displayed at the OWS Object Focus window, NT screen, and object summaries.	Boolean/ 0 or 1	0=State 0/open, stop 1=State 1/close, start	Object Default, GPL Menu, Triggerable (BI, BD only)

BD Command Table

Disabled communications means an operator suppressed communications, using the Disable command. If the object is disabled, only the Enable command is allowed.

Table 8: Binary Data Object Commands

Command		Description	Parameters	Source		
S/W Name	PMI Label			Control Process [Priority]	PMI [Priority]	Feature [Priority]
AUTO	Auto (except BO and PIDL)	Releases the Override command, and either resumes input/output processing between the field and NCM, or allows the next lowest priority command to take control of the object. Auto is an abbreviation for Automatic mode of operation.	None	N.A.	OWS [1]	N.A.
BEG_TOT	Begin Totalization	Starts Totalization data collection for the selected attribute.	None	GPL JC-BASIC MC	OWS	Scheduling
BEG_TRND	Begin Trend	Starts Trend data collection for the selected attribute.	None	GPL JC-BASIC MC	OWS	Scheduling
DISABLE	Comm. Disable	Stops the object from triggering control processes, sending COS reports to operator devices, and accepting commands (except for Comm. Enable).	None	N.A.	OWS NT	N.A.
ENABLE	Comm. Enable	Allows the object to trigger control processes, send COS reports to operator devices, and accept commands.	None	N.A.	OWS NT	N.A.
End_TOT	End Totalization	Ends Totalization data collection for the selected attribute.	None	GPL JC-BASIC MC	OWS	Scheduling
End_TRND	End Trend	Ends Trend data collection for the selected attribute.	None	GPL JC-BASIC MC	OWS	Scheduling
LOC_REP	Lock Reports	Stops the object from sending COS reports to operator devices. The current state of locked attributes are saved and compared to their state later when object is unlocked to determine if a report should be sent.	None	GPL JC-BASIC MC	OWS	Scheduling
LOC_TRIG	Lock Trigger	Prevents the object from triggering any control processes. Applies to all triggerable attributes of the object.	None	GPL JC-BASIC MC	OWS	Scheduling

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Command (Cont.)		Description	Parameters	Source		
S/W Name	PMI Label			Control Process [Priority]	PMI [Priority]	Feature [Priority]
OVERRIDE	Override (except BO and PIDL)	Lets the operator replace the current value for the object with a user-defined value. - Analog object examples: 50°F, 60% RH, or 250 GPM - Binary object examples: On or Off, Open or Close - Override is highest priority, 1 This is a manual command, only available to operators at the OWS, or, in some cases, the Network Terminal. Note: When mapped to a JC/85/40 SST or OPN/CLO, the override command is sent to the JC/85/40 system via the Gateway NCM at DL priority.	Value	N.A.	OWS [1] NT [1]	N.A.
RELEASE	Release	Clears an object value set by a Priority 2 command.	None	GPL [2] JC-BASIC or MC [2]	N.A.	N.A.
RES_TOT	Reset Totalization	Sets or resets the current Totalization value on an existing attribute. You can use this command to force the value to zero, or to any number that doesn't exceed the attribute's allowable Limit parameter.	Value Attribute	GPL JC-BASIC MC	OWS	Scheduling
RESTORE	Restore	Issued from DLLR, releases (deletes) whatever command is at Priority 2.	None	N.A.	N.A.	N.A.
SET_BD	State0/ State1	Sets the current value of the BD to user-defined units, such as On or Off. The command can be issued as a Priority 2 or 3. The Priority 3 versions of this command are disabled if the Adjust Disabled attribute is set to Yes. Note: When the object is mapped as a JC/85/40 SST or OPN/CLO point, the SET_BD is sent to the JC/85/40 system as a OP (Priority 2) or MC (Priority 3).	State 0 State 1 Eng. Unit Priority (C.P. only)	GPL [2 OR 3] JC-BASIC or MC [2 or 3]	OWS [3] NT [3]	Scheduling [3}
SHED	Shed	Acts like a State 0 (stop) command. Shed is issued by Demand Limiting (DL) and Load Rolling (LR) features to shed loads.	None	N.A.	N.A.	DL [2] LR [2]

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Command (Cont.)		Description	Parameters	Source		
S/W Name	PMI Label			Control Process [Priority]	PMI [Priority]	Feature [Priority]
UNLATCH	Unlatch	Unlatch is the only way to release a latched alarm state and restore alarm analysis. A latch attribute can be set when the object is defined. This attribute causes the object to stay in the alarm state once it changes to an alarm state. Latching stops further alarm analysis.	None	GPL JC-BASIC MC	OWS NT	N.A.
UNL_REP	Unlock Report	Allows the object to send COS reports to operator devices. The current state of the unlocked attributes is compared to the state when the attributes were locked to see if COS reporting is required.	None	GPL JC-BASIC MC	OWS	Scheduling
UNL_TRIG	Unlock Trigger	Allows the object to trigger control processes. Applies to all triggerable attributes of the object. Unlocking Triggering will cause all triggerable attributes of the object to report.	None	GPL JC-BASIC MC	OWS	Scheduling

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