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SOFTWARE AND FIRMWARE VERSIONS

This user guide is valid for the following software versions:

- Eagle 4-02-00-xx
- CARE 10.08.00

3RD-PARTY SOFTWARE LICENSES

This product contains software provided by third parties. See also Excel Web II Controller – Third-Party Software Licenses (Product Literature No.: EN2Z-0991GE51).

SYSTEM REQUIREMENTS

To operate the Excel Web II HTML Interface via touch panel PCs or any other standard PC platform, the following requirements must be fulfilled:

<table>
<thead>
<tr>
<th>Web browsers</th>
<th>PC</th>
<th>Android</th>
<th>IOS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Internet Explorer 9.0 or higher</td>
<td>Standard Web Browser</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Firefox 15.0 or higher</td>
<td>Firefox 15.0 or higher</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Google Chrome</td>
<td>Safari</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Google Chrome</td>
<td></td>
</tr>
</tbody>
</table>

NETWORK SECURITY

When operating Excel Web II in IP networks, either private (e.g., VPN) networks must be used or protection against the open Internet (e.g., with external firewalls) must be ensured.

Honeywell hereby expressly states that the Excel Web II controller is not inherently protected against cyber attacks from the Internet and that it is therefore intended solely for use in private, protected networks.

Unprotected Internet connections can expose the Excel Web II controller to cyber attacks from third parties who can then damage it and connected facility components or cause them to malfunction, or who can misuse it for illegal purposes for which the operator may then be held liable.

When directly connected to the Internet, the Excel Web II controller automatically becomes a potential target for cyber attacks. Corresponding protective measures are therefore essential if safe and reliable operation is to be ensured.

If it is not necessary for the Excel Web II controller to be accessible from the Internet, it should be isolated from the Internet via appropriate IP port settings.

If it is necessary for the Excel Web II controller to be accessible from the Internet (e.g., in order to perform remote maintenance), the use of a coded VPN connection is indispensable. Suitable VPN routers are available from numerous third-party manufacturers in a wide variety of designs, for operation at 230 V or 24 V.
For details, see also Excel Web II Networking Whitepaper (Product Literature No.: EN2Z-0992GE51).
The Eagle® is a BACnet/IP-based and BACnet MS/TP-based, freely programmable building automation controller.

As a native BACnet® building controller, Eagle® integrates into any 3rd-party BACnet® system and can integrate 3rd-party BACnet devices and controllers. Furthermore, Eagle® is a full LonWorks® controller. This gives the benefit of enabling you the use of Honeywell’s complete LonWorks® product portfolio and 3rd-party LON products.

The Eagle® can host a huge variety of building management applications, be it traditional heating, ventilation, and air conditioning (HVAC) applications, energy management functions, including optimum start/stop, night purge, and maximum load demand, supervisory functions for lighting, sunblind, heat and energy metering and many other applications.

By virtue of its “peer-to-peer” concept plus its embedded web server and embedded Email alarming, Eagle® is not dependent upon the availability of super ordinate BACnet clients (front-ends) or application network controllers.
**Versions and Firmware**

**Eagle Versions**
The Eagle controllers are available with zero/14/26 onboard IOs, with and without HMI.

For more details, please refer to Product Data EN0Z-970GE51.

**Eagle Firmware**
Includes the following parts:
- Linux operating system
- XW System
- XW Main (including firmware itself, BACnet driver and HTML pages (H-MM-LL are version numbers)

**Updating Firmware**
If, at some later point in time, i.e. after the release of a new version of the firmware, the user wishes to download the new firmware into the Eagle, this can be done either via USB or Ethernet, using CARE.

---

**Browser Access / Operator Interface**

**Operator Interface**
The Eagle® is operated via a standard web browser (Eagle Web Interface). By default, an integrated web server provides all operation pages for a full browser-based operation. Through the consequent use of software standards, any PC platform can be used as an operator interface (client). In addition to laptops and desktop PCs, panel PCs can also be used for direct flush mounting into panel doors. Other than the operating system and Internet Explorer® or Firefox®, no software needs to be installed on the client PCs.

Alternatively – or in addition – Eagle can be operated with the CL-Touch operator interface, which is a 5.7” touch-screen device (order number “CLMMI00N31”). For more details please refer to the CL-Touch product data sheet, form no. EN0Z-0929GE51 or/and to the CL Touch User Guide, form no. EN2Z-0929GE51.

**Access Modes to Eagle Controller**
Any Eagle controller on the network can be accessed via the browser-based Eagle Web Interface, both locally and remotely. The Eagle Web Interface can reside on any PC platform client such as:
- Desktop PC
- Notebook, Laptop

The controller can be accessed in one of the following ways:
- LAN (remote access)

![Fig. 1. Access to Eagle controller via LAN](image)

**Permanent (or DHCP) IP address, allocated by I.T. department**
The Eagle controller can be accessed remotely via LAN by allocating a valid and permanent (or DHCP) IP address to the controller, which is reachable within the LAN.
Procedure:

**Standard Ethernet Interface of your PC**
Change the (factory-set) configuration of the integrated Ethernet card so as to match the Eagle IP address and IP subnet.

**NOTE:**
In order to (subsequently) operate on your standard Ethernet network (again), you will have to change the configuration back to the previous settings.

**Dedicated Ethernet Interface of your PC**
If the laptop or PC with which you wish to access the Eagle via Ethernet/IP is not already equipped with an integrated Ethernet Card, or if you want to leave the IP settings of the integrated network card unchanged, you can buy and install (into your laptop or PC) an external Ethernet network card.

- **USB** (local access)

![Diagram of Access to Eagle controller via USB](image)

**Fig. 2. Access to Eagle controller via USB**

To locally connect to the Eagle controller via USB interface, an USB cable of type B standard can be used.

The USB connection type is mandatory for the initial setup of an Eagle controller and recommended due to a reasonable transfer rate (2 Mbit/s) and because no IP address changes are necessary before and after installation. In addition, the LAN connection can be used in parallel and uninterruptedly.

**Default IP address**
For access via USB, the Eagle has a factory default IP address 192.168.255.241 and Network Mask 255.255.255.0.

Procedure:
See Establish Local Connection via USB Cable section in CARE User Guide EN2Z-0970GE51.

**IP Address Allocation**
To establish any of the described connections, IP addresses must be allocated to the relevant network components such as BACnet client and Eagle controller(s).

For further information, please refer to "Setup BACnet Controller" section in CARE User Guide EN2Z-0970GE51.

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**Network**

Based on its design as an IP device (see also "Communication Protocols"), the Eagle controller "speaks" BACnet over IP (Internet Protocol) and hence, can be integrated smoothly and without the need for additional devices into any network infrastructure having regard to the corresponding network security mechanism.
Network Load
The network load for one Eagle controller in combination with one BACnet client is about 0.1% network load in a 100 Mbit network.

These figures are based on the following assumptions:

- 20 BACnet properties per display
- BACnet properties are updated by 5 BACnet client displays simultaneously
- Each property is updated every 5 s. One update message for a simple property needs 100 bytes, for a complex property 200 bytes.

  Calculation: 5 displays * 20 properties/display * 150 bytes/property * 1 update/5 s = 30000 bits per second.

If alarms should be received and properties should be in trend, everything should not consume more than 100 Kbits/s, which is 0.1% in a 100 Mbit network.

Communication Protocols

BACnet/IP - ISO 16484-5
Communication with other Eagle® controllers, with 3rd-party BACnet® devices, with Honeywell Enterprise Buildings Integrator™ and SymmetrE® front-ends, and with 3rd-party BACnet® front-ends is based on the international BACnet® Protocol. More details on the BACnet® Interoperability can be obtained from the Eagle® Protocol Implementation Conformance Statement (PICS).

BACnet MSTP – ISO 16484-5
Communication with other BACnet controllers (Honeywell and 3rd-party) is based on the international BACnet Protocol.

LonTalk® - ISO 14908
Communication with with room and zone controllers, with Excel 50/500 controllers, and optionally with LonWorks® I/O modules is based on LonTalk®. A Free Topology Transceiver (FTT-10A or FT-X1) allows a communication speed of 78 Kbaud.

HTTP
Eagle® can be operated using a standard Internet Explorer 9.0.x and Mozilla Firefox® 15.0.x. The required minimum screen resolution is 800 x 600 pixels. For more details, please refer to the "Operating the Eagle Web Interface" section.

FTP
The firmware and application are downloaded via the standard FTP (File Transfer Protocol).

SSH
SSH access to the Eagle controller is possible for the purpose of service and diagnostic of the Linux operating system and the Eagle firmware. In case this is needed, please contact your Honeywell representative.

SMTP
Simple Mail Transfer Protocol is used for the embedded Email alarming functionality of Eagle.
Time Synchronization

BACnet clients such as CentraLine ARENA AX or 3rd-party BACnet front-ends, can time sync the Eagle controller via the standard time sync or UTC time sync BACnet service. When having multiple Eagle controllers on a network without any BACnet client, the time of all devices on the bus supporting time sync can be synchronized using one source controller.

Front-Ends

The Eagle controller communicates with BACnet front-ends only.

Supported BACnet front-ends are:

- CentraLine ARENA AX / Honeywell SymmtrE Software
  For more information, please refer to the following software release bulletins:
  - CentraLine ARENA AX
    - Honeywell SymmtrE/EBI R31 SP4 or higher
- XFI Software
  The XFI has not been tested yet with Eagle, but supports BACnet functionality.

Operation and Application Software

Programming

The Eagle® is freely programmable using the CARE Engineering Tool and is thus ideal for all Building Control and Building Management tasks.

This allows making use of standard, pre-tested and pre-documentation application and control strategies.

Application Control

Four selectable control loop speed classes (multitasking) with defined cycle times and switching tables allow tailored and highly effective applications control.

User Administration

Your control system is protected by defined user access rights. This ensures that only authorized persons have access to the system data. There are six pre-defined user levels. The predefined user levels are arranged hierarchically and the sequence with descending priority is as follows:

- System Admin (128)
- Project Admin (115)
- Building Engineer (96)
- Operator (64)
- Tenant (32)
- Guest (0)

Eagle® allows the definition of up to 128 user levels by default. The above mentioned user levels are available. Each user level can have different read and write rights assigned, e.g. Display Communication Settings, Create and Delete Calendars, Change clock settings, etc. Several users with individual passwords can be defined for each user level.

NOTE: There is no limit to the number of users per user level.

Datapoints

Datapoints called "Objects" in BACnet terms are the basis of the Eagle – BACnet system. Datapoints contain system-specific information such as values, status, limit values, and default settings. The user has easy access to datapoints and the information they contain.

The user can recall and modify information in the datapoints.

Alarm Handling

Alarm handling is defined and realized in the application.

BACnet alarming

On datapoint level, alarming is done by the BACnet intrinsic reporting service.

The following point changes may generate alarm messages:

- Exceeding limit values (analog points and pulse converter point)
- Changes of state (binary and multi-state input and value datapoints)
- Faults (due to, e.g. LON communication errors or e.g. sensors breaks)
The algorithmic alarming uses the standard BACnet “Event Enrollment Object” and is used to provide the following functionality:

- Warning limits for analog datapoints (Min. and Max. warning limits, in addition to the Min and Max Alarm limits)
- Alarming for datapoint change between “auto” and “manual”
- Alarming for missing or late acknowledgement of alarms
- Maintenance alarming, based on elapsed runtime of datapoints or number of state-changes of datapoints.
- Alarming for unsuccessful transmission of Email alarms
- Alarming for stopped or started plants within Eagle

Alarming is further supported by notification class objects, which contain information required for the distribution and segregation by time and addresses of alarm/event notifications within a BACnet system.

Notification class objects allow up to 256 alarm priorities. By default, CARE provides 3 notification class objects matching the BACnet client’s alarm priorities:

- Urgent
- High
- Low
- Journal

**IMPORTANT**
The internal ring alarm buffer takes max. 100 alarms.

Eagle does also support the BACnet algorithmic alarming service.

**Time Programs**

Time programs comprise schedules and calendars.

**Schedules**

Schedules are daily and weekly time programs.

Whenever you want, you can use schedules to enter the set point or status for any datapoint.

Schedules are assigned to plants. Each plant of a controller can have multiple schedules assigned and each schedule can command datapoints of that plant.

Each schedule specifies a list of datapoint properties to command (switchpoints) on a weekly basis. The week program defines the normal daily activity of the system by specifying which switchpoints are to be commanded each day of the week. The week program applies to a definable time period. There is only one-week program per schedule.

Schedules offer 16 write priorities that define the priority for writing to the present value of output and value datapoints. Note that only priorities 9 to 16 are allowed in the controller.

The write priority applies only to the present value property of virtual points and output points. The write priority is ignored for all other types of properties.

For every schedule (week program), specific programs called exceptions can be created. Exceptions have higher priority than the week program and will overwrite the week program for a definable time period. Exceptions can be one of the following four time periods:

- **Specific Date**
  - e.g. Christmas Eve or 5.5., the whole of May, or the whole year of 2004
- **Date Range**
  - e.g. Summer holidays from 29.7-7.9.2004
- **Recurring Event**
  - e.g. every last Friday of every month
- **Calendar Reference**
  - A project-wide calendar provides dates, e.g. regional holidays and public/religious festivals or any other particular date. The time period can be a specific date, a date range or a recurring event.
Calendars
Calendars contain exception days or periods, e.g. Christmas, holidays. Calendars are valid for the whole project, and are executed in each controller but apply only to those schedules, which reference calendars. Changes in multiple particular controller schedules can be quickly made by simply changing a calendar in one controller. Thus project-wide scheduling can be influenced.

Trending
Trending (collection and storage of historical data) can be initiated and configured via the Eagle Web Interface and via BACnet clients. Trend data have unlimited lifetime and survive an application download. Trend objects must be explicitly deleted via Eagle Web Interface or BACnet. This deletes also the corresponding trend records. The trended object may be a local or a reference point in the same controller and the trended property may be integer or floating point, e.g. point value, point state, alarm limit, time stamp.

Trending via the Eagle Web Interface
Trend data are dynamically created in the controller and can be saved in a .CSV file. Trend data is stored on the integrated Flash memory of the EAGLE, and can hold up to of 360,000 trend records distributed among 497 trend log objects. In addition, three trend log objects are used for LON statistic trending. A single trend log object can include max. 2,880 trend records (max. trend buffer size). One trend record equals 30 bytes. Trend data storage can be in ‘Ringbuffer’ mode or in ‘Stop When Full’ mode.

Trending via BACnet Client
BACnet clients like the CentraLine ARENA AX will use the BACnet ‘read range service’ to readout trend values from the Eagle controller. Trend recovery for BACnet clients, specifically ARENA AX and SymmetrE optionally provide an automated recovery mechanism which allows to “backfill” missing trend data on the BACnet client side with trend values from the Eagle controller. This mechanism is described in the BACnet standard as “Automatic Trend Retrieval” (BBIB-ATR).

Protocolling
In the context of the Eagle controller, “protocolling” means creating a log of the values or states of the datapoints, which have been assigned to this particular EAGLE controller. Using the Eagle Web Interface, the user must place the corresponding datapoints into “trend”. If, at some later point in time, i.e. after lengthy operation, a protocol of the Eagle controller’s history is desired, the corresponding trend data can be generated, viewed, and downloaded (in CSV format) via the browser interface.

The trend data can even be downloaded into a BACnet client if this client supports this BACnet service.

When connected to the Eagle controller via Internet Browser, all other Eagle controllers of the same project can be operated without the necessity of a new login.

Backup/Restore
The Eagle controller supports the BACnet Backup/Restore functionality by the backup/restore of the application files.

When performing a backup/restore of the application files, the following must be noted:

- Online changes which happened up to 90 sec. before the back-up was started, may not be included in the back-up.
- Do not restore the application if the LON interface of the controller has been changed via CARE.
- The backup does not contain trend definition and LON commissioning information.
## Diagnostics

<table>
<thead>
<tr>
<th>LON Diagnostics</th>
<th>The Eagle Web Interface allows trending and display of LON specific parameters, e.g. messages received and transmitted, communication errors, etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACnet Diagnostics</td>
<td>The Eagle Web Interface allows display and analysis of BACnet services which have been initiated or executed by Eagle. Furthermore the EAGLE web interface allows searching for BACnet objects in a BACnet network.</td>
</tr>
</tbody>
</table>
The Eagle® controller is operated via a standard Internet Explorer 9.0.x and Mozilla Firefox® 15.0.x.

By default, an integrated web server provides all operation pages for a full browser-based operation.

Through the consequent use of software standards, any PC platform can be used as an operator interface (client). In addition to laptops, desktop PCs or panel PCs can also be used for direct flush mounting into cabinet doors (IP65).

Other than the operating system and Internet Explorer 9.0.x or Mozilla Firefox® 15.0.x, no software needs to be installed on the client PCs.

For detailed information on the operation of the Eagle Web Interface, please refer to the "Operating the Eagle Web Interface" section, p. 103.

The user administration (user access manager in CARE) is used for defining user rights according to the required functions. These definitions are done in CARE firstly by creating the users and issuing the functions they should have permission for in the Eagle Web Interface. In addition, the user administration (user access manager) is used for defining the language and decimal places of values the Eagle Web Interface should display. User rights can be changed in the Eagle Web Interface dependent on the predefinitions of the user in CARE.

**NOTE:** All users can operate all controllers of a project.

Changes in the user administration will be automatically synchronized among all Eagle controllers in the same project.
Access Rights List

An access rights list for a complete project will be created by assigning predefined user levels to all executable functions (access rights) of the Eagle Web Interface. An access rights list may look as follows:

<table>
<thead>
<tr>
<th>Access Right</th>
<th>User Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change Communication Settings</td>
<td>System Admin</td>
</tr>
<tr>
<td>Create and Delete Schedules</td>
<td>Building Engineer</td>
</tr>
<tr>
<td>Create and Delete Trends</td>
<td>Building Engineer</td>
</tr>
<tr>
<td>Display Diagnostics</td>
<td>Tenant</td>
</tr>
</tbody>
</table>

The predefined user levels are arranged hierarchically and the sequence with descending priority is as follows:

- System Administrator (128)
- Project Administrator (115)
- Building Engineer (96)
- Operator (64)
- Tenant (32)
- Guest (0)

Example:

When assigning ‘Operator’ to ‘Create & Delete Calendars’, a user having a user (access) level below ‘Operator’, for example ‘Tenant’ or ‘Guest’, is not able to create and delete calendars. A user having a user level equal to or higher than ‘Operator’, for example ‘Building Engineer’ or ‘Project Admin’ is able to create and delete calendars.

NOTE: When creating a project in CARE, the System Admin level is automatically assigned to the user who has created the project. Only the user who has System Admin user level can create new users and edit or delete existing users.

User Profile

For each user within a project, a user profile with the following properties will be created:

- User name
- User (access) level
- Language
- Decimal places
- Password
- Access rights
- Email address(es)

A user is identified by its user name. One of the predefined user levels will be appropriately assigned to the user (name).

Due to the access rights list definitions, this assignment automatically determines the set of access rights, which the user is allowed to execute in the Eagle Web Interface.

All users having a user level higher than or equal to the assigned user level will have this access right enabled in the Eagle Web Interface, all others will not.

NOTE: A user can carry out his/her assigned access rights in all controllers of the project.

In addition, the user profile includes the settings of the language in which the Eagle Web Interface is displayed and the number of decimal places of values to be displayed in the Eagle Web Interface.

For the email alarming function, the user must have an email address assigned which allows receiving alarm emails generated by the Eagle controller. For each user, max. 5 email addresses can be assigned.
Finally, a password for each user must be issued for secure operation of the Eagle Web Interface.

**Implications of CARE Settings**

For some items such as datapoints and control loops, access rights can be predefined in CARE only. Dependent on the settings done in CARE, some items may not be visible in the Eagle Web Interface.

**Example:** When assigning the read access level "building engineer" to all analog inputs, no analog inputs are visible for users having a user access level assigned which is lower than the ‘building engineer’ level, e.g. for users with the user access levels ‘operator’, ‘tenant’, or ‘guest’.

**NOTE:** The option ‘HMI Pin’ is provided as password for the onboard HMI.
### DATAPoints

An Eagle® controller supports up to 600 (52 for the CLEA2014xxx models) physical datapoints, called ‘objects’ in BACnet terms and an unlimited number of value datapoints, called ‘value objects’ in BACnet terms.

A datapoint has different properties according to its type. Properties are displayed and can be modified via BACnet clients, and a standard browser on operator interfaces such as laptops, desktop PCs, or panel PCs. Properties contain information about the given datapoint. Among many more, this information could be:

- Present value
- Transition events
- Descriptions
- Input limits values
- Operating status
- Elapsed run time

The following sections provide more-detailed information about the different kinds of datapoints and datapoint properties and explain which properties are assigned to which datapoints.

#### Physical Datapoints

Physical datapoints are inputs and outputs attached to hardware devices like sensors and actuators.

The following are examples of physical datapoints:

<table>
<thead>
<tr>
<th>Universal Inputs</th>
<th>NTC20kΩ / 0…10V / slow BI, and NTC20kΩ / 0…10V fix pull-up / slow BI to connect outside air temperature sensors, for example.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Outputs</td>
<td>Outputs with a continuous 0…10 V (max. 1 mA) output signal for controlling continuous actuators</td>
</tr>
<tr>
<td>Binary Inputs</td>
<td>Inputs (open = 24 V / closed 2.0 mA / totalizer 15 Hz) for processing voltage-free signals (switches, contacts, counters).</td>
</tr>
<tr>
<td>Binary Outputs</td>
<td>Outputs (relay N.O. or N.C. contact) for driving three-position actuators, for example, a damper motor; two position devices, for example, a circulation pump; and pulsed outputs</td>
</tr>
<tr>
<td></td>
<td>NOTE: Analog Outputs can also be used as Binary Outputs, by sending 0 V or 10 VDC.</td>
</tr>
<tr>
<td>Multi-State Inputs</td>
<td>Inputs used for equipment feedback (Automatic, On, Off)</td>
</tr>
<tr>
<td>Multi-State Outputs</td>
<td>Outputs controlling multi-stage fans (0, 1, 2, 3)</td>
</tr>
<tr>
<td>Pulse Converter</td>
<td>Digital inputs for processing pulsed signals up to 20 Hz (depending on I/O module specifications), for example, metered energy consumption.</td>
</tr>
</tbody>
</table>

#### Value Datapoints

Value datapoints are values (intermediate results and parameters) computed while the application program is running. In contrast to physical datapoints, value datapoints are not directly connected to hardware devices.

A typical example of a value datapoint is a room temperature setpoint.
Access via datapoint name

During system operation, you may need to access these values. To simplify this process, you can include value datapoints in the datapoint list, where you can access them directly via their datapoint name.

Like physical datapoints, value datapoints, too, can have different properties; for example, they can specify a manual value, set minimum and maximum values, or log trends.

The following are types of value datapoints:

- Analog value points
- Binary value points
- Multi-state value points

Analog Value Datapoints

Analog value points are software points containing an analog value in the user program.

An analog value point could, for example, contain a flow temperature setpoint calculated from the room setpoint and the outside air temperature via the heating curve.

Binary Value Datapoints

Binary value points are software points containing a binary value in the user program.

For example, logical AND operation:

The AND operation provides a logical 1 output when all input conditions are also logical 1. Otherwise the output is a logical 0. If the user program contains such an AND operation on different input conditions, then the output could be available as a binary value datapoint.

Multi-state Value Point

Multi-state Value datapoints allow switching 32 stages (including the "off stage") of physical digital inputs or outputs. Depending on the number of stages, the multi-state value point provides up to 32 editable stage texts, e.g., stage 1, stage 2, stage 3, etc, to be edited in CARE.

A typical example would be a multi-state room setpoint for room control with stages such as "Unoccupied", "Stand-by" und "Occupied".

Reference Datapoints

If your control and monitoring system contains more than one controller, the controllers communicate with one another via the BACnet bus BACnet/IP or/and via BACnet MS/TP. This enables one controller both to read and set the datapoints from other controllers, and to read values of 3rd-party BACnet devices of the project and external BACnet devices which are not in the project.

This data communication is realized via so-called reference input/output points. They always originate in or write to another plant and may originate in or write to another controller.

![Fig. 5. Data exchange via reference datapoints on the BACnet bus](image)

Please refer also the datapoint property description in the "Reference" section.
Mapped Datapoints

The Eagle controller may have I/O devices connected via the LonWorks network. LonWorks network variables (or individual fields of structured network variables) can be mapped to the property "Value" of physical datapoints (AI, BI, AO, BO, MI, MO). Note that multi-state points on BACnet start counting from 1 while enumerated NVs start counting from zero. So a +1 conversion table must be applied for NVI mapping and a -1 conversion table must be applied for NVO mapping.

For more information on LonWorks network variables and datapoint mapping, please refer to the CARE User Guide, EN2Z-0970GE51.

Datapoint Properties

Each datapoint type has associated with it various parameters, which allow the user to set, e.g., the datapoint name, the level of access protection, alarm behavior, and other options. These parameters are called properties. Each property performs a specific function related to the datapoint.

Not all properties are available for every datapoint type.

Datapoint Refreshing

The following properties will be simultaneously refreshed to a BACnet client or the Eagle Web Interface:

- Present value
- Operating mode
- Reliability
- Status flags
- Event state
- Event time stamp
- Acknowledged transition
- Command priorities
- Active/Inactive texts
- Elapsed active time
- Time of active time reset
- State texts
- Feedback value
- Time of present value reset

NOTE: A complete list of all properties associated with the various datapoint types can be found in the section Datapoint Properties Overview.

Operating Mode

The user is able to switch each datapoint between manual and automatic operation.

Automatic

Under automatic operation, the controller processes the values at the inputs, for instance from temperature sensors. For outputs, under automatic operation, the status shown by the user/time switch program is adopted, e.g., 'Heating circuit pump off'.

Manual

During manual operation, the controller uses the manual values, for example, 'flow temperature setpoint = 60°C'. Outputs adopt the preselected condition, for example, 'Heating circuit pump on'.

Local Manual Override

If manual override controls are present on either the analog output or digital output modules, then the status of these controls (automatic/manual override) is displayed in the Eagle Web Interface.

Via the standard ‘Priority Array’ functionality of BACnet, the manual override read and write control is possible.
Properties Descriptions

How to Read the Datapoint Properties Description

In the following, all datapoint properties which exist in the Eagle Web Interface and in CARE are described. Each property description starts with a table that explains:

- which datapoints the property applies to
- where the property is available, either in CARE or in the Web Interface or in both of them
- if the property is editable and where (Web Interface and/or CARE) it can be changed.
- the corresponding equivalent name, if the property name is different in the Web Interface and in CARE

All valid items are highlighted in gray. Non-valid items remain in white.

Examples: The following table explains the Active / Inactive Text property. In this case the property applies to the BI, BO and BV datapoint types. It is available in the Web Interface and in CARE. It can be edited in CARE but not in the Web Interface. In the Web Interface the property is not called Active / Inactive Text but is displayed as Auto or Manual property.

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Editing</td>
<td>-</td>
<td>X</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Equivalent</td>
<td>Auto, Manual</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

The following table explains the Ackn. (Acknowledged Transitions) property. In this case the property applies to all datapoints except the RI (reference input). It is available in the Web Interface only. It cannot be edited at all and there is no equivalent.

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
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<tr>
<td>Editing</td>
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<td>Equivalent</td>
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</tr>
</tbody>
</table>

In some exceptions, remarks in quotation marks are added. In the following table of the Engineering Unit property description, "assigned to value" means that the engineering unit is not available as property but is assigned to the current value of the datapoint.

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Editing</td>
<td>&quot;assigned to value&quot;</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Equivalent</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
### Ackn. (Acknowledged Transitions)

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
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</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Editing</td>
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</tr>
</tbody>
</table>

Shows whether a transition has been acknowledged or not. By default, each transition will be acknowledged by the Eagle controller and the Ackn. Property is checked in the Eagle Web Interface. On the BACnet client, transitions can be set to be asked for acknowledgement by the operator manually.

### Active / Inactive Text

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
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<tr>
<td>Editing</td>
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<tr>
<td>Equivalent</td>
<td>Auto, Manual</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

To binary points, texts can be assigned in CARE to display the corresponding active or inactive state of the point in the Eagle Web Interface. The texts include active/inactive (passive) descriptions with unit, and number of states.

**Example:** Active / Inactive text assigned to binary output for switching a pump.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Number of states</th>
<th>State (0)</th>
<th>State (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>Stopped</td>
<td>Running</td>
</tr>
</tbody>
</table>

The actual state is displayed as present value in the Eagle Web Interface.

See also "Auto" and "Manual" sections.

### Alarm Delay

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
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</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
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<tr>
<td>Editing</td>
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</tr>
</tbody>
</table>

The alarm delay determines how long a ‘To-Off-Normal’ or a ‘To-Normal’ transition must exist before an alarm is generated. Entering an alarm delay time of 10 seconds means that the limit value must be exceeded for at least 10 seconds before this datapoint generates an alarm. If the limit value only lasts for 7 seconds, then no alarm occurs. The alarm handling for a datapoint can be completely disabled by setting the alarm delay time to a value of 100000 or higher.

### Alarm Text

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
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<td>User Interface</td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>Editing</td>
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</tr>
</tbody>
</table>
For the property ‘Alarm text’, CARE allows entering personalized alarm texts for the different event states of an analog or digital point. The assigned alarm text is shown with the alarm, which is caused by the corresponding transition event.

Alarm texts can have 256 characters at maximum with no restriction on the used character type.

Analog points have twelve, Digital points have six possible event states. The following table shows the event states and examples for alarm texts:

<table>
<thead>
<tr>
<th>Nr.</th>
<th>Analog Event States</th>
<th>Alarm Text Example</th>
<th>Digital Event States</th>
<th>Alarm Text Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>High Limit to Normal</td>
<td>Value below High Limit</td>
<td>Fault to Normal</td>
<td>Input OK</td>
</tr>
<tr>
<td>2</td>
<td>Low Limit to Normal</td>
<td>Value above Low Limit</td>
<td>Normal to Fault</td>
<td>Input Failure</td>
</tr>
<tr>
<td>3</td>
<td>Fault to Normal</td>
<td>Sensor OK</td>
<td>Off-Normal to Normal</td>
<td>Input back to Normal</td>
</tr>
<tr>
<td>4</td>
<td>Normal to High Limit</td>
<td>Value above High Limit</td>
<td>Normal to Off-Normal</td>
<td>Input Change to Alarm</td>
</tr>
<tr>
<td>5</td>
<td>Normal to Low Limit</td>
<td>Value below Low Limit</td>
<td>Fault to Off-Normal</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Low Limit to High Limit</td>
<td>Off-Normal to Fault</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>High Limit to Low Limit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Fault to High Limit</td>
<td>Sensor Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Fault to Low Limit</td>
<td>Sensor Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Normal to Fault</td>
<td>Sensor Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>High Limit to Fault</td>
<td>Sensor Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Low Limit to Fault</td>
<td>Sensor Break</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

According to the BACnet Specification, events can be of the type ‘alarm’ or ‘event’. On the BACnet client, alarms will be graphically indicated by blinking in the status line and shown in the alarm summary. Events will not be indicated in the status line and will be shown in the event summary.

The notify type can be defined and changed in CARE. In the Eagle Web Interface, the notify type (alarm type) is displayed only.

For all notification classes, notify type ‘Alarm’ must be used.

See also "Notify Type" section.

Alarm Value

Please refer to the “Alarm Value Enable” section.
Defines the alarm condition of a binary input or value point when an alarm should be reported in case of binary input changes. The alarm condition can be either the active state or the inactive state of the point e.g. 0 or 1, ON or OFF, Up or Down. If the present value is equal to this condition for at least the alarm delay time, then an OFF-Normal event is generated. In addition an alarm delay can be entered.

### Auto

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
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</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
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<td></td>
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<tr>
<td>Editing</td>
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<tr>
<td>Equivalent</td>
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<td></td>
</tr>
</tbody>
</table>

Sets the datapoint in automatic (Auto) operation mode. In Auto operation mode, the datapoint shows the present value processed by the controller (sensor input values, time program output values).

See also "Active / Inactive Text" section.

### BACnet Instance

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Editing</td>
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</tr>
<tr>
<td>Equivalent</td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

The BACnet instance number is part of the internal BACnet addressing in every BACnet system (BACnet communication). The BACnet instance number of datapoints is not visible in the Eagle Web Interface and the user does not need the BACnet instance number in order to operate the Eagle controller.

The BACnet instance number of a device object is visible in the Eagle Web Interface.
When creating objects in CARE such as datapoints, schedules or calendars, CARE assigns an instance number to each object. The instance number is unique within the same object type but the same instance number may also exist in other object types. The instance number of the device object is unique on the whole BACnet network.

The following table shows examples of instances, which CARE automatically assigns to the corresponding BACnet objects while they are created:

<table>
<thead>
<tr>
<th>Object Type</th>
<th>Instance Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog input 1</td>
<td>1</td>
</tr>
<tr>
<td>Analog input 2</td>
<td>2</td>
</tr>
<tr>
<td>Analog input 3</td>
<td>3</td>
</tr>
<tr>
<td>Analog input 4</td>
<td>4</td>
</tr>
<tr>
<td>Analog input 5</td>
<td>5</td>
</tr>
<tr>
<td>Binary input 1</td>
<td>1</td>
</tr>
<tr>
<td>Binary input 2</td>
<td>2</td>
</tr>
<tr>
<td>Binary input 3</td>
<td>3</td>
</tr>
<tr>
<td>Binary input 4</td>
<td>4</td>
</tr>
<tr>
<td>Binary input 5</td>
<td>5</td>
</tr>
</tbody>
</table>
The instance number in combination with the BACnet object type information is one method in creating and adding a 3rd party BACnet device to the BACnet bus (see also "BACnet Object ID" section).

This information must be provided by or to the project engineer/vendor who is responsible for the 3rd party BACnet device to be added to the CARE project, or who is responsible for integrating the Eagle controller into a 3rd party BACnet system.

NOTE: In Europe it is common using the EDE data format for interchanging information between BACnet objects. For further information, please access the BACnet Interest Group Europe e.V. at:

http://www.big-eu.org

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>Editing</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

The BACnet object type is part of the internal BACnet addressing in every BACnet system (BACnet communication). The BACnet object type is not visible in the Eagle Web Interface and the user does not need the BACnet object type in order to operate the Eagle controller.

In the BACnet standard, BACnet objects are classified in types.

Example: Analog inputs are of BACnet object type "analog input(0)", binary inputs are of BACnet object type "binary input(3)", devices such as the Eagle controller and 3rd party BACnet devices are of BACnet object type "device(8)"

The BACnet object type information in combination with the instance number is one method in creating and adding a 3rd party BACnet device to the BACnet bus (see also "BACnet Object ID" section).

This information must be provided by or to the project engineer/vendor who is responsible for the 3rd party BACnet device to be added to the CARE project, or who is responsible for integrating the Eagle controller into a 3rd party BACnet system.

The BACnet Object type defaults according to the BACnet convention are as follows (see next page):

<table>
<thead>
<tr>
<th>BACnet Object</th>
<th>Object Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog input</td>
<td>0</td>
</tr>
<tr>
<td>Analog output</td>
<td>1</td>
</tr>
<tr>
<td>Analog value</td>
<td>2</td>
</tr>
<tr>
<td>Averaging</td>
<td>18</td>
</tr>
<tr>
<td>Binary input</td>
<td>3</td>
</tr>
<tr>
<td>Binary output</td>
<td>4</td>
</tr>
<tr>
<td>Binary value</td>
<td>5</td>
</tr>
<tr>
<td>Calendar</td>
<td>6</td>
</tr>
<tr>
<td>Command</td>
<td>7</td>
</tr>
<tr>
<td>Device</td>
<td>8</td>
</tr>
<tr>
<td>Event enrollment</td>
<td>9</td>
</tr>
<tr>
<td>File</td>
<td>10</td>
</tr>
<tr>
<td>Group</td>
<td>11</td>
</tr>
</tbody>
</table>
The BACnet object ID is part of the internal BACnet addressing in every BACnet system (BACnet communication). The BACnet object ID is not visible in the Eagle Web Interface and the user does not need the BACnet object ID in order to operate the Eagle controller.

The BACnet object ID is a unique ID within a BACnet device. BACnet Object IDs must be provided by or to the project engineer/vendor who is responsible for the 3rd party BACnet device to be added to the CARE project, or who is responsible for integrating the Eagle controller into a 3rd party BACnet system.

The BACnet object ID will be kept unique within a CARE project and is calculated within CARE by the following Standard BACnet formula:

\[ \text{BACnet object ID} = \text{BACnet object type} \times 2^{22} + \text{Object Instance number} \]

The typical object addressing within a BACnet system is done by using the device ID and the Object ID.

### Change of State Count

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
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<td>Equivalent</td>
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</tr>
</tbody>
</table>

Displays the number of state changes of the binary datapoint

### Change of Value Increment

See "Increment" section.
Bit Mask

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
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<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
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</tr>
<tr>
<td>Equivalent</td>
<td>Event Parameters</td>
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</tr>
</tbody>
</table>

The bitmask shows the values/conditions that are observed.

See also "Bit String(s)" and "Event Enrollment" sections.

Bit String(s)

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
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<td>Equivalent</td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Bit String(s) shows the possible logical values (true, false) resulting from the comparison of the selected values/conditions and the underlying bit string mask.

See also "Bit Mask" and "Event Enrollment" sections.

Characteristic

<table>
<thead>
<tr>
<th>Datapoint Type</th>
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<th>AO</th>
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<th>BO</th>
<th>BV</th>
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<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
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</tr>
</tbody>
</table>

If the datapoint should be mapped to a NV (see LON Mapping property) and the engineering units of both do not match, for example, the NV has °C and the datapoint has °F, a characteristic (conversion table) must be assigned. Default characteristics are delivered with the CARE software.

Examples:

- 2-10 V = 0-100 %
- Linear input
- Direct out 0-100 %
- +1
- -1

etc.

For example, the characteristic "Linear input" converts volts (NV value) into percent (datapoint value) as follows:

<table>
<thead>
<tr>
<th>NV value</th>
<th>DP value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,000</td>
<td>0,000</td>
</tr>
<tr>
<td>10,000</td>
<td>100,00</td>
</tr>
</tbody>
</table>

COV Period

See "Period" section.
### Current Value

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
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<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
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<td>CARE</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Editing</td>
<td>&quot;Reset to&quot;</td>
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<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

Shows the current accumulated value of the pulse converter. The current value can be changed by reset.

### Datapoint Name

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
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</tr>
</thead>
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</tr>
</tbody>
</table>

Name assigned to each point for operator use in locating and commanding the point. This name must be unique within a controller, and this is guaranteed by CARE.

**Example:**

The temperature of a room is recorded at a sensor input, and then the associated datapoint name could be as follows:

**Room_Temp.1.10** (Room temperature, 1st floor, room 10)

The datapoint can be accessed directly by selecting this name in the Eagle Web Interface or the BACnet client.

Point names can have a maximum of 40 alphanumeric characters. They must not include Tabs, double quotes, space characters and the following characters, ?, *, :, /, \, <, >. All other printable characters are allowable (A-Z, 0-9, +, -, _, äöüßÄÖÜé@§$%&#, etc). For example, 12A is a datapoint name, but 12 is not.

It is not recommended to use quotes or double quotes!

A project may use ISO 8859-1 or ANSI X3.4 characters. All BACnet Servers on a network should use the same character set (Honeywell and 3rd party devices).

**IMPORTANT**

It is recommended not to use characters, which are not part of ANSI X3.4 (US-ASCII). Note that the max. length of the datapoint name for Lon points should not exceed 13 characters (see Lon point property). But the BACnet Datapoint name may be longer.

### Deadband

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
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</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
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<td>CARE</td>
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<tr>
<td>Editing</td>
<td>X</td>
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</tr>
</tbody>
</table>

Defines the value of the deadband in order to set off an alarm of event type ‘To-Normal’. For this, the present value must, for at least the defined alarm delay (time), remain within the range:

Low limit plus deadband and high limit minus deadband
A controller contains up to 600 physical datapoints and an unlimited number of value datapoints. When creating datapoints, an individual datapoint name is assigned to each of these datapoints.

Plain-language descriptors can be created with an unlimited number of characters each. These descriptors are then assigned to datapoints via the property "Descriptor".

Descriptors complete the information concealed behind the datapoint name. They can contain, for instance, a reference to a section of a building.

The following list is an example of the relationship between datapoint names and descriptors:

<table>
<thead>
<tr>
<th>Datapoint Name</th>
<th>Descriptor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room temp floor 1</td>
<td>Heating circuit, West wing</td>
</tr>
<tr>
<td>Room temp floor 3</td>
<td>Heating circuit, West wing</td>
</tr>
<tr>
<td>Room temp floor 10</td>
<td>Heating circuit, East</td>
</tr>
<tr>
<td>Room temp corridor</td>
<td>Heating circuit, East</td>
</tr>
<tr>
<td>Flow temp floor 1</td>
<td>Heating circuit, West wing</td>
</tr>
<tr>
<td>Lights floor 1</td>
<td>Building section V</td>
</tr>
<tr>
<td>Lights corridor</td>
<td>Building section V</td>
</tr>
</tbody>
</table>

See "Description" section.
### Direct/Reverse

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Editing</td>
<td>X</td>
<td>X</td>
<td></td>
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</tr>
</tbody>
</table>

Allows turning the direction of a 0-10 V characteristic.

### Direction

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
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<tr>
<td>Editing</td>
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<td></td>
<td></td>
<td></td>
<td>Lon Point</td>
<td></td>
</tr>
</tbody>
</table>

 Shows whether a mapped datapoint is mapped to an input NV (NV in) or an output NV (NV out).

See also "Lon Point" section.

### Engineering Unit

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
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<tbody>
<tr>
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<td>CARE</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Editing</td>
<td>&quot;assigned to value&quot;</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Engineering units are pre-defined by the BACnet standard and will be assigned to datapoints in CARE. In the Eagle Web Interface, the present value is displayed with the assigned engineering unit.

**Examples:**

If, for instance, the external temperature is measured by an analog datapoint, the engineering unit of this datapoint must be set to °C or °F. If the electrical load is detected by a pulse converter input, the engineering unit must be set to kWh for kilowatt-hours.

In the Eagle Web Interface, engineering units are displayed read only.

### EOV / EOV Optimization

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
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</thead>
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<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
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<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

 Defines whether the datapoint should be optimized or not, if the datapoint is used as setpoint for energy optimized heating or ventilation (EOH or EOV).
Show the transition types that can be selected for reporting:

- **To Off-Normal**
  The alarm reaches off-normal state, that is, the datapoint value exceeds the high limit, or remains under the low limit.

- **Back To-Normal**
  The alarm is going to normal state, that is, the value of the datapoint remains under the high limit, or exceeds the low limit.

- **To Fault**
  The alarm originates in a fault such as sensor break, etc. (depends on point type).

**IMPORTANT**
Always enable both options, ‘To Off-Normal’ and ‘Back To-Normal’, otherwise you will miss one of the corresponding alarms.

In the Eagle Web Interface, the transition type is selected by checking the Reporting checkbox.

See also "Transition Events" and “Alarm and Event Priority Classification” sections.

---

**Event Enrollment**

The primary purpose of the Event Enrollment object is to define an event and to provide a connection between the occurrence of an event and the transmission of a notification message to one or more recipients. The Event Enrollment object contains the event-type description, the parameters needed to determine if the event has occurred (Algorithmic Change Reporting), and a device to be notified. Alternatively, a Notification Class object may serve to identify the recipients of event notifications. A device is considered to be "enrolled for event notification" if it is the recipient to be notified or one of the recipients in a Notification Class object referenced by the Event Enrollment object. Event Enrollment objects are the basics for algorithmic change reporting.

See also "Bit Mask", "Bit String(s)", and "Time Delay" sections.

---

**Event State**

For any datapoint type, an application and/or product specific value range is defined in which the point is in the operating (event) state ‘Normal’. If the point value has changed due to exceptional situations, the event state of a datapoint can be either ‘Off-Normal’ or ‘Fault’.

The event states can be shortly described as follows:

**Normal**  
Point is in normal operating state.

**Off-Normal**  
Point value is out of normal range.

**Fault**  
Point is prevented from proper operation. Point value can be in normal or out of normal range. Due to the maloperation of the point, the value is unreliable.

Causes for a fault can be, for example sensor and cable breaks. See “Status Flag indications for details.

**High Limit**  
Point value has exceeded the high limit. Special case of the Off-Normal state of analog inputs, analog outputs, and analog value points (see also Alarm range properties in the table below).

**Low Limit**  
Point value has dropped below the low limit. Special case of the Off-Normal state of analog inputs and outputs (see also Alarm range properties in the table below).

---

### Fault

**NOTE:** The Fault property exists twice. In one case, it displays the actual status of certain datapoints, in the other case; it allows selecting which condition should be the fault condition.

#### Display of actual status

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
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</tr>
</tbody>
</table>

Indicates the fault status of the datapoint. When the ‘Fault’ status flag is enabled, the datapoint or the physical input is not reliable, e.g. in case of sensor break (Open Loop). See “Status Flag Indications” for details.

**NOTE:** Multiple flag indications may be possible.

#### Alarm reporting of Faults:

The ‘Fault’ status of a point will generate an alarm if a notification class is selected.

**Example:** A ‘To-Fault transition’ will always enable the ‘In Alarm’ flag. Hence both, the ‘In Alarm’ and the ‘Fault’ status flags are enabled.

#### Definition of fault condition

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
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</tr>
</thead>
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<td>Web Interface</td>
<td>CARE</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Editing</td>
<td>x</td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equivalent</td>
<td>Is Fault Condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Defines the state which indicates and sets off a ‘Fault’ event. If enabled, the fault text of the corresponding transition event is displayed.
Example:

<table>
<thead>
<tr>
<th>States</th>
<th>Fault</th>
<th>Fault Text Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>2</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

See also "Is Fault Condition" section.

### Feedback Value

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Editing</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Defines the datapoint that should provide the value for feedback control in case of BACnet fault and command failure alarms. The feedback point must be a input of the same type. The selected feedback point will not be available on the controller HMI and HTML web interface.

**NOTE:**
The feedback point must not be used in a control loop since as a result the control loop will not be executed properly.

### FIO Mapping

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Editing</td>
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<td>Equivalent</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Shows the Field Input Output details such as:

- **Mapping**
  PV that is I/O is mapped to present value

- **Name**
  name of the datapoint/NV

- **Type**
  data type of present value, e.g. float, integer, or SNVT_count for NVs

- **Direction**
  input or output and source hardware (onboard, panel bus, LON bus)

The settings depend on the kind of module the datapoint is assigned to (Onboard, panel bus, LON bus)

### Fixed Prio

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
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<td>Editing</td>
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<tr>
<td>Equivalent</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
The Fixed Priority property allows saving the last value of an analog value (AV), or an output (AO, BO, MO) during the power cycle of the controller. The value is saved in the goldcap buffer RAM of the controller. The fixed priority property is written to priority level 9 in the priority array. As long as no value is written to the priority level 8, the value of priority level 9 will be saved cyclically in the NAND Flash and re-read after the re-start of the controller. After then the value can be overwritten by RACL.

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Editing</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The High Limit Enable property defines if high limit alarms are generated on the BACnet bus. The following conditions must be true for the system to generate an alarm:

- High limit is exceeded and this condition remains present for at least the defined alarm delay (time)
- Transition events ‘To-OffNormal’ and ‘To-Normal’ are enabled
- Notification class (urgent, high or low) is allocated to this point
- Notify type is set to ‘Alarm’ (not ‘Event’)

If all of these conditions are true, then an alarm of event type ‘To-Off-Normal’ is set off.

The high limit can be predefined in CARE and changed in the Eagle Web Interface later.

**NOTE:** According to the BACnet standard, disabling the High Limit does only disable the reporting of the High Limit Alarm onto the BACnet bus. When the High Limit is exceeded, the datapoint will still be “in Alarm”, and if a BACnet front-end is polling the alarms of a BACnet controller, also datapoints with High Limit disabled will be displayed on the BACnet front-end as being “in Alarm”.

With Eagle it is possible to disable both High and Low Limit alarms at the same time, if the alarm delay time is set to 100,000 sec or longer.

**In Alarm**

**NOTE:** The In Alarm property exists twice. In one case, it displays the actual status of certain datapoints, in the other case, it allows selecting which condition should be the alarm condition.

**Display of actual status**

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
<td></td>
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<td></td>
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<td>Editing</td>
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<td></td>
</tr>
</tbody>
</table>

Displays the alarm status of the datapoint, which can be caused by faults and Off-Normal conditions.

**NOTE:** Multiple flag indications may be possible.

**Example:** A ‘To-Fault transition’ will always enable the ‘In Alarm’ flag. Hence both, the ‘In Alarm’ and the ‘Fault’ status flags are enabled.

See also “Fault” and "Out of Service" sections.
**Definition of alarm condition**

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
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<td></td>
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<tr>
<td>Editing</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equivalent</td>
<td>Is in Alarm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

 Defines the state which indicates and sets off an 'alarm'. If enabled, the alarm text of the corresponding transition event is displayed.

**Example:**

<table>
<thead>
<tr>
<th>States</th>
<th>In Alarm</th>
<th>Alarm Text Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>2</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

See also "Is in Alarm" section.

**Increment**

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
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<tr>
<td>Editing</td>
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<tr>
<td>Equivalent</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Change of Value Increment</td>
</tr>
</tbody>
</table>

The change of value increment (COV increment) specifies the minimum change in present value that causes the controller sending the present value to recipients on the BACnet bus (e.g. Eagle Web Interface).

The COV increment is also used as the minimum change in the present value for value-based trending.

**NOTE:** For the pulse convertor point type, a time-based COV increment is possible.

**Usage with Reference Inputs**

When using reference input points which read input values, the inputs can be reside either in different plants of the same controller (internal referencing) or in plants of different controllers (external referencing).

If the reference input point reads values from an internal referencing plant, every change will be transmitted.

If the reference input point reads values from an external referencing plant, the COV increment of the source datapoints applies. Please note that in this case, the COV value must be set to appropriate (low) values in order to minimize falsification of the transmitted value.

In case the connected data point does not support COV, the poll rate set in CARE defines the interval in sec, that the reference input polls the connected data point.

If the connected data point does support COV, then the poll rate has no effect.

So the poll rate does not ensure a fault signal within the poll rate time when a connection is lost. In case of a loss of communication the fault flag will latest be set after 30 minutes.
Initial Value

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Editing</td>
<td>x</td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

For reference input points, an initial value can be entered, which will be utilized at system startup if the reference input has not yet received a value from the connected point.

Input NV

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Editing</td>
<td>-</td>
<td>x</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equivalent</td>
<td>NV Type</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Defines the network variable type (NVT) of the Lon point in CARE, e.g. SNVT_temp for an analog input point (NV - Input).

See also "NV Type" section.

IO Configuration

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Editing</td>
<td>x</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The I/O configuration is not visible in the Eagle Web Interface, but only in CARE.

Analog input and output points must be configured prior to their assignment to a particular terminal on a module in CARE. This is done by selecting the appropriate configuration such as NTC, PT100 Type F, etc., for the datapoint. The assignment of the configuration results in the automatic setting of the configuration properties for the datapoint.

For pull-up resistor handling, please refer to the "Pull-Up Resistor Handling" section.

Is Alarm Condition

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Editing</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equivalent</td>
<td>In Alarm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Defines the state which enables the `Alarm` flag. If enabled, the alarm text of the corresponding transition event is displayed.
Example:

<table>
<thead>
<tr>
<th>State Text</th>
<th>Is Alarm Condition</th>
<th>Alarm Text Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>2</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

See also "In Alarm" section.

**Is Fault Condition**

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE&lt;br&gt;Editing</td>
<td>x&lt;br&gt;Equivalent</td>
<td>Fault</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Defines the state which enables the ‘Fault’ flag. If enabled, the fault text of the corresponding transition event is displayed.

Example:

<table>
<thead>
<tr>
<th>State Text</th>
<th>Is Fault Condition</th>
<th>Alarm Text Display</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>2</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

See also "Fault" section.

**Last Transition**

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE&lt;br&gt;Editing</td>
<td>-&lt;br&gt;Equivalent</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Shows the date when the last transition was performed.

**LON Point**

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE&lt;br&gt;Editing</td>
<td>-&lt;br&gt;Equivalent</td>
<td>Direction</td>
<td></td>
<td></td>
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</table>

Defines in CARE if the datapoint should be mapped to a NV.

Input points can only be mapped to input NVs and output points can only be mapped to output NVs.

NOTE: If an output point is defined as "with switches", CARE will automatically map an input NV to that output point. The input NV will be used for sending the manual switch state a value from the I/O-board to the Eagle controller. The value of the manual switch is reflected at priority 1 in the priority array of the datapoint.

See also "Direction" section
Low Limit Enable

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
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</table>

The Low Limit Enable property defines the low limit for the creation of alarms of analog points. The following conditions must be true for the system to generate an alarm:

- The present value falls below the low limit and this condition remains present for at least the defined alarm delay (time)
- Transition events 'To-OffNormal' and 'To-Normal' are enabled
- Notification class (urgent, high or low) is allocated to this point
- Notify type is set to 'Alarm' (not 'Event')

If all of these conditions are true, then an alarm of event type 'To-Off-Normal' is set off.

The Low Limit can be predefined in CARE and changed in the Eagle Web Interface later.

NOTE:
According to the BACnet standard, disabling the Low Limit only disables the reporting of the Low Limit Alarm onto the BACnet bus. When the Low Limit is exceeded, the datapoint will still be "in Alarm", and if a BACnet front-end is polling the alarms of a BACnet controller, also datapoints with Low Limit disabled will be displayed on the BACnet front-end as being "in Alarm".

With Eagle it is possible to disable both High and Low Limit alarms at the same time, if the alarm delay time is set to 100,000 sec or longer.

Manual

<table>
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<tr>
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</table>

Sets the datapoint in manual operation mode in which the present value will be overwritten with a desired value manually entered by the user.

See also "Active Text / Inactive Text" section.

Manual Life Safety

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
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</tbody>
</table>

Shows the status of the manual override switch or potentiometer of the LON module.
### Mapping

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
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</tbody>
</table>

Shows the mapping type of a mapped datapoint. For example, if the datapoint is mapped to the present value property, PV = Present Value is displayed.

### Minimum Present Value

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
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</tbody>
</table>

Defines the minimum value of the graphical bar display in the EBI. Defaults to the Low Limit Reporting value.

### Maximum Present Value

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
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</tbody>
</table>

Defines the maximum value of the graphical bar display in the EBI. Defaults to the High Limit Reporting value.

### Notification Class

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
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</table>

The notification class can be defined and changed in CARE and in the Eagle Web Interface.

The notification class enables alarming for the datapoint by selecting a notification class with a given priority. By default, the following notification classes with descending priority can be selected:

- Urgent
- High
- Low
- Journal

These default notification classes match the default notification classes of the BACnet client.

Each recipient assigned to a notification class will receive the datapoint alarm triggered by the selected notification. But, alarms will only be generated for the enabled transitions (To-Normal, To-OffNormal, and/or To-Fault) of a recipient. Each
enabled transition will be propagated with the selected notification (see also "Alarm and Event Priority Classification" section).

This connection has not to be mixed up with the transitions selected under **Transition Events** (see "Transition Events" section).

### Notify Type

<table>
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<tr>
<th>Datapoint Type</th>
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</table>

The notify type can be defined and changed in CARE. In the Eagle Web Interface, the notify type (alarm type) is displayed only.

For all notification classes, the notify type ‘Alarm’ must be used.

According to the BACnet Specification, events can be of the type ‘alarm’ or ‘event’. On the BACnet client, alarms will be graphically indicated by blinking in the status line and shown in the alarm summary. Events will not be indicated in the status line and will be shown in the event summary.

See also "Alarm Type" section.

### NV Name

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
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</tbody>
</table>

Shows the name of the NV, e.g. NVInsideAirTemp that is mapped to the datapoint.

### NV Type

<table>
<thead>
<tr>
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<th>AI</th>
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<td><strong>Equivalent</strong></td>
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</tbody>
</table>

Shows the type of the mapped NV, e.g. SNVT_temp.

See also "Input NV" and "Output NV" sections.

### Out Of Service

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
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</table>

Generates and indicates the ‘out of service’ status of the datapoint. The ‘out of service’ property allows decoupling the physical input or output from the datapoint.
For inputs the decoupling is done by manual override. For outputs this is done by checking the “Out of Service” flag.

The ‘out of service’ property is suited to fix the physical input or output state, e.g. in case of maintenance checks.

In the following, the states of the ‘out of service’ flag/property of the various BACnet objects are listed:

AI, BI, MI
Out Of Service = unchecked:
Present value has not been overwritten

Out Of Service = checked:
Present value has been overwritten
Present value is decoupled from the physical input and will not track changes to the physical input.

AO, BO, MO
Out Of Service = checked:
Changes to the present value are decoupled from the physical output.
The present value property is still controlled by the prioritization mechanism (Priority Array, Relinquish Default)

AV, BV, MV
Out Of Service = checked:
Present value is prevented from being modified by the application.
The present value property is still controlled by the prioritization mechanism (Priority Array, Relinquish Default)

Pulse Converter
Out Of Service = unchecked:
Present value has not been overwritten

Out Of Service = checked:
Present value has been overwritten
Present value is decoupled from the Count property and will not track changes to the input.

See also "In Alarm" and "Fault" sections.

---

### Output NV

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
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</thead>
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<tr>
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<td>Web Interface</td>
<td>CARE</td>
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</table>

Defines the network variable type (NVT) of the Lon point in CARE, e.g. SNVT_lev_percent for an analog output point (NV - Output).

See also "Input NV" section.

---

### Period

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
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</table>
Defines the amount of time in seconds between the periodic transmissions of the present value. This property can be used alone or in combination with the Increment property.

When the period property is used in combination with the increment property, the present value will always be updated periodically independent on the transmissions of the present value due to the COV setting.

Example:

<table>
<thead>
<tr>
<th>Increment</th>
<th>Period</th>
<th>Present Value Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2 K</td>
<td>3 s</td>
<td>when present value has changed by 0.2 K or more</td>
</tr>
<tr>
<td>0.2 K</td>
<td>3 s</td>
<td>every 3 s and when present value has changed by 0.2 K or more</td>
</tr>
</tbody>
</table>

**Priority Level**

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
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<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
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</tr>
</tbody>
</table>

The value of the present value is controlled by a command prioritization mechanism which is based upon a fixed number of priorities that are assigned to command – issuing entities (BACnet tasks, control strategy, time program, and manual operator inputs). Each of these entities writes to the present value with its assigned priority level. The number of priorities is arranged in a priority list of descending priority.

Example:

<table>
<thead>
<tr>
<th>Priority Level</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Manual Life Safety</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Critical Equipment Control</td>
</tr>
<tr>
<td>6</td>
<td>19.5 °C</td>
</tr>
<tr>
<td>7</td>
<td>Minimum On Off</td>
</tr>
<tr>
<td>8</td>
<td>Manual Operator</td>
</tr>
<tr>
<td>9</td>
<td>21.0 °C</td>
</tr>
<tr>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>-</td>
</tr>
<tr>
<td>12</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Control Program</td>
</tr>
<tr>
<td>16</td>
<td>Relinquish Default</td>
</tr>
<tr>
<td></td>
<td>20.0 °C</td>
</tr>
</tbody>
</table>

The priority list can include max. 16 values and will be continuously updated by written values caused by the command-issuing entities.
The value of the highest priority level is always written to the present value as long as the priority list is not empty. If the list is empty, the user-definable relinquish default value is written to the present value.

For the example in the table, Critical Equipment Control has the highest priority and is written to the present value. As soon as the priorities 5 and 8 are relinquished e.g. via BACnet service, the relinquish default of 20.0°C will be valid for the present value.

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
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</tr>
</thead>
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<td>User Interface</td>
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<td>CARE</td>
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</tbody>
</table>

The polarity indicates the relationship between the physical state of the input and the logical state represented by the present value. If the polarity is NORMAL, then the ACTIVE state of the present value is also the ACTIVE or ON state of the physical input. If the polarity is REVERSE, then the ACTIVE state of the present value is the INACTIVE or OFF state of the physical input.

<table>
<thead>
<tr>
<th>Polarity</th>
<th>Present Value</th>
<th>Physical State of Input</th>
<th>Physical State of Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORMAL</td>
<td>INACTIVE</td>
<td>OFF or INACTIVE</td>
<td>not running</td>
</tr>
<tr>
<td>NORMAL</td>
<td>ACTIVE</td>
<td>ON or ACTIVE</td>
<td>running</td>
</tr>
<tr>
<td>REVERSE</td>
<td>INACTIVE</td>
<td>ON or ACTIVE</td>
<td>not running</td>
</tr>
<tr>
<td>REVERSE</td>
<td>ACTIVE</td>
<td>OFF or INACTIVE</td>
<td>running</td>
</tr>
</tbody>
</table>

By default, the present value is selected as property of a reference input point in CARE.

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
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</tbody>
</table>

The read access level can be defined and changed in CARE only. In the Eagle Web Interface, the read access level is displayed only.

The read access level assigned to a datapoint determines which user level can read values (properties) of that particular datapoint on the Eagle Web Interface.

A user who has a user level equal to or higher than the assigned read access level of the datapoint, will have this access right enabled in the Eagle Web Interface, all others will not (for further details, please refer to the User Administration section).
The reference property of a reference input point provides the source (BACnet object) which passes the value to the reference input point. The reference property of a reference output point provides the source (BACnet object) which passes the value to the reference output point.

Sources can be any point of any Eagle controller and 3rd-party BACnet device of the project.

Reference Points

Reference points are a type of software point that can share point information across plants. If plants are located in different controllers, the point information will be automatically transferred across the BACnet bus.

Reference Input Points

Reference input points receive information from a point in another plant of the same controller (internal reference) or of another plant in another controller or 3rd-party device (external reference). Controllers and 3rd-party devices can reside in the same or in different projects (for detailed procedure see CARE User Guide EN2Z-0970GE51).

Each reference input is associated with a physical or value datapoint (source point) somewhere in a plant residing in a controller on the bus. The source point cannot be a receiver point and source point and receiver point cannot reside in the same plant.

Reference Input Point Operation

If the reference input point reads values from an internal referencing plant, every change will be transmitted.

If the reference input point reads values from an external referencing plant, the COV increment of the source datapoints applies. Please note, that in this case, the COV value must be set to appropriate (low) values in order to minimize falsification of the transmitted value.

In case the connected data point does not support COV, the poll rate set in CARE defines the interval in sec, that the reference input polls the connected data point. If the connected data point does support COV, then the poll rate has no effect. So the poll rate does not ensure a fault signal within the poll rate time when a connection is lost. In case of a loss of communication the fault flag will latest be set after 30 minutes.

See also "Input NV", "Output NV" and "Remote Status Flags" sections.
Reliability

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
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<th>BV</th>
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</tbody>
</table>

Shows whether the hardware assigned to the datapoint is in proper condition or not. Depending on the datapoint type, the following conditions may be displayed:

- **No Error Detected**: Loop is in proper condition, that is, present value is reliable; that is, no other fault has been detected.
- **No Sensor**: Sensor may be not connected
- **No Output**: Hardware may be not connected
- **Unreliable Other**: The controller has detected that the present value is unreliable, but none of the other conditions describe the nature of the problem. A generic fault other than those listed above has been detected, e.g., a Binary Input is not cycling as expected.

**NOTE**: For binary output datapoints, the reliability will work only if the service type of the corresponding NVo in CARE is set to ‘acknowledged’.

Relinquish Default

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
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</thead>
<tbody>
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<td>User Interface</td>
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</tbody>
</table>

Defines the value that will be written to the present value, if the priority list is empty which means that no other value is present in the priority list. The relinquish default value allows starting up a control system with a defined status/value. The relinquish default value is predefined in the application in CARE and can be changed in the Eagle Web Interface.

For further information on priority levels and command priorities, please refer to the “Priority Level” section.

Relinquish Priority

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
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</tbody>
</table>

This is a property which can be only accessed via the CARE control loop editor. The property allows relinquishing a certain priority level. It is written on each execution of the RACL loop. If it is not required to relinquish a datapoint, a number higher than 17 need to be written on this property.

**Example**: To bring a datapoint from manual to auto mode, 8 needs to be written on the Relinquish Priority property (see figure on next page).
For further information on priority levels and command priorities, please refer to the "Priority Level" section.

### Remote Status Flags

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
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</tbody>
</table>

Reads the status flags from remote devices using a reference input in order to use the status flag information in the application. The property can be read via BACnet and in DDC programs.

The status flag information is coded as a BitString with 4 bits (0..3). The status flags are read as follows:

- in alarm (bit 0)
- in fault (bit 1)
- overridden (bit 2)
- out of service (bit 3)

### Reporting

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
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</tbody>
</table>

Defines, which transition type will be reported, that is, which transition should be saved in the alarm buffer and in the alarm list in the Web Interface.

See also "Transition Events" section.

### Reset to

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
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</tbody>
</table>

Resets the current value to a specific value for a:

- pulse converter
- runtime counter of a binary output
- state counter of a binary point

The counting will restart.
Change of State Count

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
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</table>

Displays the number of state changes of the binary datapoint.

Resolution

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
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</table>

Shows the resolution which defines the smallest recognizable change of the present value. The smaller the value the more precise a value change can be recognized.

Runtime (Active Time)

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
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</table>

Shows the runtime of the connected device. The runtime (active time) can be changed by reset.

The runtime can be reported as follows:

In CARE, use the IDT statement to read the ‘Elapsed Active Time’ property of a datapoint. Compare this value to a limit value and use an additional point to report an alarm.

Safety Position

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
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<tr>
<td>Equivalent</td>
<td>Communication Failure</td>
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</tbody>
</table>

In case of communication failure or application stop, the device is commanded to one of the following positions if the controller does not deliver a value (no response):

Analog Output:
- 0 %
- 50 %
- 100 %
device is commanded to the selected percentage value

Binary Output:
- OFF (logical)
- ON (logical)
device is commanded to the selected logical state (name depends on state texts definition)

- Remain in current position
device is commanded to the last valid position

NOTE:
For analog outputs, the safety position is affected by the characteristic used for the controller modules. For particular characteristics there is no linear correlation between percentage value and voltage output:

<table>
<thead>
<tr>
<th>DP Type</th>
<th>Listbox number</th>
<th>Characteristic</th>
<th>Safety position (%)</th>
<th>in DP values</th>
<th>in Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>AO</td>
<td>1..10</td>
<td>User defined</td>
<td></td>
<td>0 5 10</td>
<td></td>
</tr>
<tr>
<td>AO</td>
<td>9</td>
<td>0-100%=2-10V</td>
<td>-25 37.5 100</td>
<td>0 5 10</td>
<td></td>
</tr>
<tr>
<td>AO</td>
<td>10</td>
<td>100-0%=2-10V</td>
<td>125 62.5 0</td>
<td>0 5 10</td>
<td></td>
</tr>
<tr>
<td>AO</td>
<td>12</td>
<td>LINEAR GRAPH</td>
<td>0 50 100</td>
<td>0 5 10</td>
<td></td>
</tr>
<tr>
<td>AO</td>
<td>24</td>
<td>0-10V=0-100%</td>
<td>0 50 100</td>
<td>0 5 10</td>
<td></td>
</tr>
<tr>
<td>AO</td>
<td>25</td>
<td>2-10V=0-100%</td>
<td>0 50 100</td>
<td>2 6 10</td>
<td></td>
</tr>
<tr>
<td>DO</td>
<td>--</td>
<td>DO on AO</td>
<td>OFF / ON</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>MOT</td>
<td>12</td>
<td>LINEAR GRAPH</td>
<td>0 50 100</td>
<td>0 5 10</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: The user-defined characteristics 1 through 10 can be changed; in this context, characteristics 3, 4, 5, 6, 9, 10 are pre-defined by CARE (default characteristics) and characteristics 1 and 2 are not pre-defined. The default characteristics 3 through 6 are pressure input characteristics which should not be used for an analog output.

In general, for the user-defined characteristics 1 through 10, the safety positions 0%, 50%, 100% do always mean 0V, 5V, 10V; in this context the datapoint values for characteristics 9 and 10 are deviant.

Safety Value

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
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<th>MV</th>
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<th>RI</th>
<th>RO</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
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</tbody>
</table>

In case of communication failure or application stop, the device is commanded to one of the following positions if the controller does not deliver a value (no response):

- Last Valid Value
device is commanded to the last valid position

- Safety Value
device is commanded to the value entered in Safety Value (CARE)
**Scaling Factor**

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
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<th>MI</th>
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</tbody>
</table>

Input pulses from utility meters (gas, water, heat, etc.) transmitted via LonWorks can be connected to pulse converter inputs using the property "Scaling Factor". The pulses supplied by the meters are multiplied by the scaling factor and are then ready to be read as pure consumption values. The "Scaling Factor" thus always indicates the value of each pulse received.

The adjustable range is 0.0 through 100,000,000.0.

The number of decimal places depends on the selected engineering unit.

**Example:** A heat meter supplies 10 pulses per kWh "consumed". Accordingly, the scaling factor (= value of a pulse) is 0.1 kWh/pulse.

---

**Sensor Offset**

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<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
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</table>

The sensor offset applies only for analog input datapoints connected to panel bus or onboard IO's. It allows shifting the value.

The adjustable range is -100,000,000.0 through 100,000,000.0

It is entered in the engineering unit of the datapoints.

If the datapoint is in fault state the sensor offset is not added to the datapoint.

---

**Time to Close**

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
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</table>

Defines the time in sec the motor should need to close the controlled device when using a 3 Position Output

---

**Time to Open**

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<tr>
<th>Datapoint Type</th>
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</table>

Defines the time in sec the motor should need to open the controlled device when using a 3 Position Output
Multistate datapoints allow switching 256 states (stages) including the “off stage” of physical digital inputs or outputs. For each state, a state text can be created and assigned to the point in CARE. The state text is displayed on the Eagle Web Interface when the point switches the input or output to the corresponding state (stage).

**Example:** Multi-stage fan with state texts: stage 1, stage 2, stage 3, etc.

### States

See “#States and State Text” sections.

### #States

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
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<th>BV</th>
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</tbody>
</table>

Shows the number of states of a multi-state datapoint.

### Time Delay

<table>
<thead>
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<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
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<tr>
<td>User Interface</td>
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<td>CARE</td>
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</tbody>
</table>

The time delay determines how long a ‘To-Off-Normal’ or a ‘Back-To-Normal’ transition must exist before an event enrollment alarm is sent to the recipient. Entering a time delay of 10 seconds means that the limit value must be exceeded for at least 10 seconds before this event enrollment sends an event notification to the recipient. If the limit value only lasts for 7 seconds, then no event notification is sent.

### Time of Last Reset

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
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</thead>
<tbody>
<tr>
<td>User Interface</td>
<td>Web Interface</td>
<td>CARE</td>
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</tbody>
</table>

Shows the time of the last reset of a binary output or pulse converter datapoint.
Time of State Count Reset

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
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<tbody>
<tr>
<td>User Interface</td>
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<td>CARE</td>
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</tbody>
</table>

Shows the time of the last state counter reset for the binary datapoint.

Transition Events

<table>
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<th>Datapoint Type</th>
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</tbody>
</table>

Defines which transition type (To-Off-Normal, Back To-Normal, and/or To Fault) will be reported and tracked by time stamping. The timestamps can be seen in the Eagle Web Interface.

See also "Event" and "Reporting" sections.

Type

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
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<tbody>
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</tbody>
</table>

Shows the datapoint type, e.g. analog input, digital output, etc.

Use as Setpoint

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
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</tbody>
</table>

If in CARE this property is set for a datapoint, the Use as Setpoint field will be displayed in the HTML Interface and on the controller HMI for overwriting the present value without the necessity of setting the datapoint into manual mode before. Instead, the present value can be overwritten quickly by entering the value in the Use as Setpoint field displayed in the corresponding interface.

NOTE: The field will not be available in the HTML Interface and on the controller HMI if the property is not enabled in CARE.
With Switches / 3 Position Output

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
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<th>AV</th>
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</table>

The With Switches / 3 Position Output options are not visible in the Eagle Web Interface, but only in CARE.

Defines whether the point transmits a continuous signal and is on a board with switches (AO, BO), or if the point is a 3 position output (AO).

Write Access Level

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>AI</th>
<th>AO</th>
<th>AV</th>
<th>BI</th>
<th>BO</th>
<th>BV</th>
<th>MI</th>
<th>MO</th>
<th>MV</th>
<th>PC</th>
<th>RI</th>
<th>RO</th>
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</tr>
</tbody>
</table>

The write access level can be defined and changed in CARE only. In the Eagle Web Interface, the write access level is displayed only.

The write access level assigned to a datapoint determines which user level can write values (properties) to that particular datapoint on the Eagle Web Interface.

A user who has a user level equal to or higher than the assigned write access level of the datapoint, will have this access right enabled in the Eagle Web Interface, all others will not (for further details, please refer to the User Administration section).

Datapoint Properties Overview

Each point in a controller has associated properties such as datapoint name, notification class and descriptor. Point properties may not be available for editing in BACnet front-ends such as the Central (BACnet client), or in the Eagle Web Interface. Contrariwise in CARE, some online properties such as present value, statuses, etc. are not available in principle.

This chapter contains tables for each point type. The tables list point properties and presents the following information for each:

- **Property denotation** specifies either the attribute name in the related CARE Datapoint Properties tab and/or in the Eagle Datapoint Details tabs.
- Whether or not the property is available for **off-line editing**. “Off-line” editing refers to changes made to database values while the controller is not active in the system. In other words, when you are using CARE to change copies of controller files, not the files in the actual controller.
- Whether or not the attribute is available for **on-line editing**. “On-line” editing refers to changes made to controller files while the controller is active. For example, if you are using the Eagle Web Interface or a BACnet client to change field values in a controller while it is operating.
## Analog Input

<table>
<thead>
<tr>
<th>Property Denotation</th>
<th>Online-Editing</th>
<th>Offline-Editing</th>
</tr>
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<tbody>
<tr>
<td><strong>Eagle Web Interface</strong></td>
<td><strong>CARE</strong></td>
<td><strong>BACnet</strong></td>
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<tr>
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<tr>
<td>Description</td>
<td>Descriptor</td>
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<tr>
<td>Name / NV Name</td>
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<td>Type / NV type</td>
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<tr>
<td>Direction</td>
<td>Input or output (NV) and hardware source (onboard, panel, Lon)</td>
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<tr>
<td>Read access level</td>
<td>Read access level</td>
<td>-</td>
</tr>
<tr>
<td>Write access level</td>
<td>Write access level</td>
<td>-</td>
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<tr>
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<tr>
<td>Notification class</td>
<td>Notification class</td>
<td>notification-class</td>
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<td>Notify type</td>
<td>Notify type</td>
<td>notify-type</td>
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</tr>
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<td>High limit Reporting</td>
<td>high-enable</td>
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<td>Low limit Reporting</td>
<td>low-enable</td>
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<td>Deadband</td>
<td>deadband</td>
</tr>
<tr>
<td>Suppress alarm</td>
<td>&quot;n.a.&quot;</td>
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<td>-</td>
</tr>
<tr>
<td>Overridden</td>
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<td>-</td>
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<td>Out of Service</td>
<td>&quot;n.a.&quot;</td>
<td>-</td>
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<tr>
<td>Increment</td>
<td>Change of value increment</td>
<td>cov-increment</td>
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<td>Alarm text</td>
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</tr>
<tr>
<td>&quot;assigned to value&quot;</td>
<td>Engineering unit</td>
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<td>Point role (EDK)</td>
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<td>Offline-Editing</td>
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<td>CARE</td>
<td>BACnet</td>
</tr>
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<td>BACnet Object Type</td>
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<td>BACnet Object ID</td>
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<td>&quot;n.a.&quot;</td>
<td>BACnet Object Instance Number</td>
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<td>Low Limit</td>
<td>Low Warning Limit</td>
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<td>Bit Mask, Bit String(s)</td>
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<td>Reporting: To Off-Normal, To Fault, Back to Normal</td>
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<td>Reporting</td>
<td>+</td>
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<td>&quot;n.a.&quot;</td>
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</tr>
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<td>&quot;n.a.&quot;</td>
<td>BACnet object ID</td>
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</tr>
<tr>
<td>Event state</td>
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<td>Object type</td>
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<td>-</td>
</tr>
<tr>
<td>Write access level</td>
<td>Write access level</td>
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</table>

NOTE: Comments are written in *italic* and in "quotation marks"
## Analog Output

### Property Denotation

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<thead>
<tr>
<th>Eagle Web Interface</th>
<th>CARE</th>
<th>BACnet</th>
<th>Eagle Web Interface</th>
<th>BACnet</th>
<th>CARE</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Datapoint name displayed in title line of dialog&quot;</td>
<td>Datapoint Name</td>
<td>-</td>
<td></td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

### GENERAL

| Type (Type/Inst.) | "n.a." | - | - |
| Description       | Descriptor description | - | + | + |
| Mapping           | "n.a." | - | - |
| Name / NV Name    | "automatically generated by CARE" | - | - |
| Type / NV type    | - | + |
| Direction         | Input or output (NV) and hardware source (onboard, panel, Lon) | - | + |
| Read access level | Read access level | - | + |
| Write access level| Write access level | - | + |

### ALARMING

| Notification class | Notification class | - | + |
| Notify type       | Notify type notification-class | - | + | + |
| Event:            | To Off-Normal, To Fault, Back to Normal "selectable under Reporting, see Reporting" | Report: To Off-Normal, To Fault, Back to Normal notify-type | + | + | + |
| Reporting         | Reporting | + | + |
| Ackn(owedged)     | "n.a." | event-enable | - | + | - |
| Last transition   | "n.a." | - | - |
| High limit enable | High limit Reporting | - | + |
| Low limit enable  | Low limit Reporting high-enable | - | + | + |
| Deadband          | Deadband low-enable | + | + | + |
| Suppress alarm    | "n.a." | + | - |
| Alarm delay       | Alarm delay deadband time-delay | + | + | + |

### VALUES

| Auto, Manual      | "n.a." | + | - |
| Minimum Present Value | Min Present Value | - | + |
| Maximum Present Value | Max Present Value min-pres-value | - | + | + |
| Manual Life Safety | "n.a." | max-pres-value | - | + | - |
| Resolution        | "n.a." | - | - |
| Reliability       | "n.a." | - | - |
| Direct / Reverse  | Direct / Reverse | + | + |
| Safety Position   | Communication Failure | + | + |
| In alarm          | "n.a." | - | - |
| Fault             | "n.a." | - | - |
| Overridden        | "n.a." | - | - |
| Out of Service    | "n.a." | - | - |
| Increment         | Change of value increment cov-increment | + | + | + |

### COMMAND PRIORITIES

<p>| Relinquish default | Relinquish default relinquish-default | + | + | + |</p>
<table>
<thead>
<tr>
<th>Property Denotation</th>
<th>Online-Editing</th>
<th>Offline-Editing</th>
</tr>
</thead>
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<tr>
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<td>CARE</td>
<td>BACnet</td>
</tr>
<tr>
<td>Alarm text, &quot;displayed in alarm buffer&quot;</td>
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<td>&quot;assigned to value&quot;</td>
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<tr>
<td>&quot;n.a.&quot;</td>
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<td>+</td>
</tr>
<tr>
<td>Characteristic</td>
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<td>+</td>
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<td>Point role (EDK)</td>
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<tr>
<td>With Switches</td>
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<td>+</td>
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<tr>
<td>3 Position Output</td>
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<td>BACnet Object ID</td>
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<td>Low Limit</td>
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<td>Bit Mask, Bit String(s)</td>
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<td>Event: To Off-Normal, To Fault, Back to Normal &quot;selectable under Reporting, see Reporting&quot;</td>
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**NOTE:** Comments are written in italic and in “quotation marks”
## Analog Value

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<th>Offline-Editing</th>
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</tr>
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<td>Description</td>
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NOTE: Comments are written in *Italic* and in “quotation marks”
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**NOTE:** Comments are written in *italic* and in "quotation marks"
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NOTE: Comments are written in *italic* and in “quotation marks”
## Multi-State Output

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<td>notify-type</td>
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NOTE: Comments are written in *italic* and in “quotation marks”
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### Pulse Converter

#### Property Denotation

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<td>COV Period</td>
<td>cov-period</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Alarm text, &quot;displayed in alarm buffer&quot;</td>
<td>Alarm text relinquish-default</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>&quot;assigned to value&quot;</td>
<td>Engineering unit</td>
<td>-</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>Scaling factor</td>
<td>-</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>Point role (EDK)</td>
<td>-</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>BACnet Object Type</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Property Denotation</td>
<td>Online-Editing</td>
<td>Offline-Editing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------</td>
<td>----------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eagle Web Interface</td>
<td>CARE</td>
<td>BACnet</td>
<td>Eagle Web Interface</td>
<td>BACnet</td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>BACnet Object ID</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>BACnet Object Instance Number</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>EVENT ENROLLMENTS</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>-</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Description</td>
<td>-</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Event type</td>
<td>Event type</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>High Limit</td>
<td>High Warning Limit</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Low Limit</td>
<td>Low Warning Limit</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Deadband</td>
<td>Deadband</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Bit Mask, Bit String(s)</td>
<td>Status Flags</td>
<td>-</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Bit Mask, Bit String(s)</td>
<td>Event Parameters</td>
<td>-</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Bit String(s)</td>
<td>List of Values</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Time delay</td>
<td>Alarm delay</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Notify type</td>
<td>Notify type</td>
<td>-</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Notification class</td>
<td>Notification class</td>
<td>-</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Event: To Off-Normal, To Fault, Back to Normal &quot;selectable under Reporting, see Reporting&quot;</td>
<td>Reporting: To Off-Normal, To Fault, Back to Normal</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Reporting</td>
<td>Reporting</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Acknowledged</td>
<td>&quot;n.a.&quot;</td>
<td>x</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Last transition</td>
<td>&quot;n.a.&quot;</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>BACnet object ID</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Event state</td>
<td>&quot;n.a.&quot;</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Object type</td>
<td>&quot;n.a.&quot;</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Read access level</td>
<td>Read access level</td>
<td>-</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Write access level</td>
<td>Write access level</td>
<td>-</td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Comments are written in *italic* and in "quotation marks"
Reference Input

<table>
<thead>
<tr>
<th>Property Denotation</th>
<th>Online-Editing</th>
<th>Offline-Editing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eagle Web Interface</td>
<td>CARE</td>
<td>BACnet</td>
</tr>
<tr>
<td>&quot;Datapoint name displayed in title line of dialog&quot;</td>
<td>Datapoint Name</td>
<td>-</td>
</tr>
<tr>
<td>Auto</td>
<td>&quot;n.a.&quot;</td>
<td>-</td>
</tr>
<tr>
<td>Reliability</td>
<td>&quot;n.a.&quot;</td>
<td>-</td>
</tr>
<tr>
<td>Object ID</td>
<td>BACnet Object ID</td>
<td>-</td>
</tr>
<tr>
<td>Object Type</td>
<td>BACnet Object Type</td>
<td>-</td>
</tr>
<tr>
<td>Property</td>
<td>Property</td>
<td>-</td>
</tr>
<tr>
<td>Destination Point Location</td>
<td>Reference</td>
<td>-</td>
</tr>
<tr>
<td>Out of service</td>
<td>&quot;n.a.&quot;</td>
<td>+</td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>BACnet Instance Number</td>
<td>-</td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>Initial value</td>
<td>-</td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>Read access level</td>
<td>-</td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>Write access level</td>
<td>-</td>
</tr>
</tbody>
</table>

NOTE: Comments are written in *Italic* and in "quotation marks"

Reference Output

<table>
<thead>
<tr>
<th>Property Denotation</th>
<th>Online-Editing</th>
<th>Offline-Editing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eagle Web Interface</td>
<td>CARE</td>
<td>BACnet</td>
</tr>
<tr>
<td>&quot;Datapoint name displayed in title line of dialog&quot;</td>
<td>Datapoint Name</td>
<td>-</td>
</tr>
<tr>
<td>Auto</td>
<td>&quot;n.a.&quot;</td>
<td>-</td>
</tr>
<tr>
<td>Reliability</td>
<td>&quot;n.a.&quot;</td>
<td>-</td>
</tr>
<tr>
<td>Value</td>
<td>Priority for writing</td>
<td>-</td>
</tr>
<tr>
<td>Object ID</td>
<td>BACnet Object ID</td>
<td>-</td>
</tr>
<tr>
<td>Object Type</td>
<td>BACnet Object Type</td>
<td>-</td>
</tr>
<tr>
<td>Property</td>
<td>Property</td>
<td>-</td>
</tr>
<tr>
<td>Destination Point Location</td>
<td>Reference</td>
<td>-</td>
</tr>
<tr>
<td>Out of service</td>
<td>&quot;n.a.&quot;</td>
<td>+</td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>BACnet Instance Number</td>
<td>-</td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>Initial value</td>
<td>-</td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>Read access level</td>
<td>-</td>
</tr>
<tr>
<td>&quot;n.a.&quot;</td>
<td>Write access level</td>
<td>-</td>
</tr>
</tbody>
</table>

NOTE: Comments are written in *Italic* and in "quotation marks"
I/O Initialization

Input Datapoints (AI, BI)

Start

BACnet input datapoints will be initialized with the value 'zero'. After initialization, the field devices values will be polled from the input module. During the poll all startup activities are stopped. (Example: If a module is not present, it takes longer for startup).

Reference inputs inside the controller are updated during the “Datapoints” stage. Reference inputs (3rd party and in the same CARE project) from external sources are initialized after “Controller is running”.

The Firmware ensures that the outputs are not written before RACL has finished the first loop. The first heartbeat update for the output datapoint is 10 seconds after “LON inputs poll”. Outputs which are changing are updated directly.

Note: Typically the there is an additional delay configured in the control loops (e.g. with the macro GNFPFA). It starts with the first start of RACL.

Alarm behavior

At the beginning, all input points are not in alarm by default except those of which input values have caused an alarm.

After the start alarm time has expired, an alarm will be saved in the alarm buffer, shown in the alarm list and reported to the BACnet client as long as the alarm exists. It starts after the Controller is running.

Restart, Reset, Power Failure, Application- and Firmware Download

The following values/statuses will be cyclically saved in the Flash memory and restored after restart, reset or power failure of the Eagle controller.

- Runtime counter
- Last reset time
- Elapsed active time
- Out of Service flag
- Points in manual operating mode
The advantage here is that these values will survive an application and firmware download.

When an EAGLE controller is replaced, these values cannot be transferred to the new EAGLE controller.

**Output Datapoints (AO, BO)**

**Start**

BACnet output datapoints will be initialized with the relinquish default value. After the first heartbeat, the relinquish default value or the present value created out of the application will be sent to the LON bus.

The output priority 1 “Manual Life Safety” represents the status of a local manual override switch at the LON module (XFL and XFC modules). This information is read from the Lon Module override switch after every start of the controller.

In principle, the value with the highest BACnet array priority (2 – 8) will be saved in the battery-retentive RAM (see "Manual Override" section below).

**Alarm behavior**

At the beginning, all output points are not in alarm by default except those of which output values have caused an alarm.

After the start alarm time has expired, an alarm will be saved in the alarm buffer, shown in the alarm list and reported to the BACnet client as long as the alarm exists.

**Restart, Reset, Power Failure, Application- and Firmware Download**

The following values/statuses will always be saved in the battery-retentive RAM and restored after restart, reset, or power failure of the Eagle controller:

- Runtime counter
- Last reset time
- Elapsed active time
- Highest output priority of the priorities 2 to 8

**NOTE:** The datapoint value and the status of the ‘Out of Service’ flag will not be transmitted to the LON bus and will not be saved in battery retentive RAM.

**Manual Override**

The value with the highest BACnet array priority (2 – 8) will be saved in the battery-retentive RAM and will then be restored after restart, reset, or power failure of the Eagle controller.

**Reference Inputs**

**Start**

Starts with the ‘Start Value’ defined in CARE. Later the referencing input value will be taken. For more information on the COV value, please refer also to the "Change of Value Increment" and the "View / Edit Values" sections).

**NOTE:** Reference inputs are not visible in the Eagle Web Interface.

Reference inputs will try to subscribe COV. If the source device supports COV, COV will be subscribed with a life-time of 1800 seconds, and will be re-subscribed every 900 seconds. If the source device does not subscribe COV, the source object (datapoint) will be polled.

In case the connected data point does not support COV, the poll rate set in CARE defines the interval in sec, that the reference input polls the connected data point. If the connected data point does support COV, then the poll rate has no effect. So the poll rate does not ensure a fault signal within the poll rate time when a connection is lost. In case of a loss of communication the fault flag will latest be set after 30 minutes.
The following table gives an overview of the I/O initialization of the various datapoints regarding alarming, manual override and behavior at start, restart and power failure.

<table>
<thead>
<tr>
<th>I/O Initialization</th>
<th>Inputs</th>
<th>Outputs</th>
<th>Values</th>
<th>Pulse Converter</th>
<th>Reference Inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initialization (Initial value)</strong></td>
<td>'0'. Continued with value transmitted from field device</td>
<td>'Relinquish default'. With first heartbeat, 'Relinquish default' or application value is sent to LON bus. Manual Override switch is read from LON module</td>
<td>'Relinquish default'.</td>
<td></td>
<td>'Start value' defined in CARE. Continued with referencing input value.</td>
</tr>
<tr>
<td><strong>Alarming</strong></td>
<td>After start alarm time has expired, alarm is saved in the alarm buffer, shown in the alarm list and reported to the BACnet client as long as the alarm exists.</td>
<td>After start alarm time has expired, alarm is saved in the alarm buffer, shown in the alarm list and reported to the BACnet client as long as the alarm exists.</td>
<td>After start alarm time has expired, alarm is saved in the alarm buffer, shown in the alarm list and reported to the BACnet client as long as the alarm exists.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Battery-retentive Flash Storage / Restore after Restart, Reset, Power Failure</strong></td>
<td>Runtime Counter Last reset time Elapsed active time Out of Service Manual value</td>
<td>Runtime Counter Last reset time Elapsed active time Value with highest BACnet array priority (2 – 8), includes Manual value</td>
<td>Last reset time Elapsed active time Value with highest BACnet array priority (2 – 8), includes Manual value</td>
<td>Count value Reset time</td>
<td></td>
</tr>
<tr>
<td><strong>Manual Override</strong></td>
<td>Saved in the battery-retentive RAM</td>
<td>Saved in the battery-retentive RAM</td>
<td>Saved in the battery-retentive RAM</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Setting Datapoints into Manual Mode (Manual Override)**

A datapoint’s current value can be overridden manually either by:

- Entering the manual value in the datapoint’s dialog box in the Eagle Web Interface or BACnet client (applies to all datapoints). This is often called “fixing a point”

  Or,

- Using manual override controls on the analog output (XFL522) or digital output (XFL524) modules (applies to analog and binary output datapoints only). See also "Feedback Value" section.

**NOTE:** If AO and BO datapoints are created with switches, the manual override control of the modules are reflected in the command priorities (level 1 = manual life safety).
NOTE: Switching a point between Auto and Manu operating mode only causes an alarm if the value or state is in the Off-Normal range or status, and if the alarming is enabled.

Setpoint Input for Value Datapoints

If in CARE the "setpoint" property is set for a value datapoint, the Use as Setpoint field will be displayed in the HTML Interface for overwriting the present value without the necessity of setting the datapoint into manual mode before. Instead, the present value can be overwritten quickly by entering the value in the Use as Setpoint field displayed in the HTML interface.

NOTE: The field will not be available in the HTML Interface if the property is not enabled in CARE.

Setting and Detecting Manual Overrides of Datapoints

Procedure

1. In the Details dialog box of the selected datapoint, select the Values tab.

2. Click the Manual radio button and enter the value into the field.

   Or, to override an analog or binary input datapoint physically, adjust the override control on the module.

3. To detect and view if an input datapoint is in manual override, you can select the Datapoints screen.

RESULT: Datapoints in manual override (in this case BACnet priority 8 = "manual operator" is active) will display the "overridden" (OVR) flag checked. Physical and binary input datapoints will in addition display the "out of service" (OOS) flag checked. The BACnet Standard specifies an input to be "out of service", when it is decoupled from the field signal.
Status Flag Indications

Input Point Status Flags

When an input datapoint is set into Manual mode and its value will be overwritten, the ’overridden’ and ’out of service’ flags are set. The enabled ’out of service’ flag indicates that the datapoint is decoupled from the physical input (field device) to prevent a field device value from instantly overwriting the manual value in the next scan cycle. The ’fault’ flag is enabled if the reliability is one of the following:

- No Sensor
- Open Loop
- Shorted Loop
- Process Error
- Unreliable Other

<table>
<thead>
<tr>
<th>Status Flag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Error Detected</td>
<td>Loop is in proper condition, that is, present value is reliable; that is, no other fault has been detected.</td>
</tr>
<tr>
<td>No Sensor</td>
<td>No field device value update has been received.</td>
</tr>
<tr>
<td></td>
<td>For LON points only:</td>
</tr>
<tr>
<td></td>
<td>The heartbeat timer has expired and the following poll has failed. Note that the heartbeat must have been activated in CARE. Sensor may not be connected.</td>
</tr>
<tr>
<td>No Error Detected</td>
<td>Loop is in proper condition, that is, present value is reliable; that is, no other fault has been detected.</td>
</tr>
<tr>
<td>No Sensor</td>
<td>No field device value update has been received.</td>
</tr>
<tr>
<td></td>
<td>For LON points only:</td>
</tr>
<tr>
<td></td>
<td>The heartbeat timer has expired and the following poll has failed. Note that the heartbeat must have been activated in CARE. Sensor may not be connected.</td>
</tr>
<tr>
<td>Open Loop</td>
<td>No sensor connected</td>
</tr>
<tr>
<td>Shorted Loop</td>
<td>Input is short-circuited</td>
</tr>
<tr>
<td>Process Error</td>
<td>Internal error, not possible to read input value</td>
</tr>
<tr>
<td>Unreliable Other</td>
<td>Invalid Value is received.</td>
</tr>
<tr>
<td></td>
<td>For LON points only</td>
</tr>
<tr>
<td></td>
<td>With INVALID Match:</td>
</tr>
<tr>
<td></td>
<td>the point will work with the value defined by INVALID Match</td>
</tr>
<tr>
<td></td>
<td>For all point types</td>
</tr>
<tr>
<td></td>
<td>No INVALID Match:</td>
</tr>
<tr>
<td></td>
<td>The point will work with last received value. The controller has detected that the present value is unreliable, but none of the other conditions describe the nature of the problem. A generic fault other than those listed above has been detected, e.g., a Binary Input is not cycling as expected.</td>
</tr>
</tbody>
</table>

Output Point Status Flags

When an output datapoint is set into Manual mode, its current value will be overwritten by the manual value, which then has the higher priority = ’Manual Operator’ (8) and the overridden flag is set. As long as no other process of higher priority than (8) writes to the analog output, the manual value remains present.

The ’fault’ flag is enabled if the reliability is ’No Output’ which tells that the Acknowledged Service has failed.

<table>
<thead>
<tr>
<th>Status Flag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Error Detected</td>
<td>No fault has been detected.</td>
</tr>
<tr>
<td>No Output</td>
<td>Acknowledged Service has failed, or Hardware may be not connected.</td>
</tr>
</tbody>
</table>

The ’out of service’ flag is enabled, if field device value updates to the output are blocked, for example by the BACnet client.
Alarm and Event Priority Classification

Alarms and events traversing the BACnet network need prioritization to assure that important information reaches its destination and is acted upon quickly. To assure alarm prioritization at the network level, the network priority as defined in the network layer protocol control is set automatically according to the alarm and event priority settings (see following table).

<table>
<thead>
<tr>
<th>Alarm and Event Priority</th>
<th>Network Priority Association</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 – 63</td>
<td>Life Safety message</td>
</tr>
<tr>
<td>64 - 127</td>
<td>Critical Equipment message</td>
</tr>
<tr>
<td>128 - 191</td>
<td>Urgent message</td>
</tr>
<tr>
<td>192 - 255</td>
<td>Normal message</td>
</tr>
</tbody>
</table>
Alarm Behavior of Datapoints

**Event States**

For any datapoint type, an application and/or product specific value range is defined in which the point is in the operating (event) state ‘Normal’. If the point value has changed due to exceptional situations, the event state of a datapoint can be either ‘Off-Normal’ or ‘Fault’.

The event states can be briefly described as follows:

**Normal**
Point is in normal operating state.

**Off-Normal**
Point value is out of normal range.

**Fault**
Point is prevented from proper operation. Point value can be in normal or out of normal range. Due to the maloperation of the point, the value is unreliable.

Causes for a fault can be, for example sensor and cable breaks. See “Status Flag indications for details.

**High Limit**
Point value has exceeded the high limit. Special case of the Off-Normal state of analog inputs and outputs (see also Alarm range properties in the table below).

**Low Limit**
Point value has dropped below the low limit. Special case of the Off-Normal state of analog inputs and outputs (see also Alarm range properties in the table below).

The alarm range of a datapoint is defined by the datapoint’s specific alarm range properties.

**Examples:**

<table>
<thead>
<tr>
<th>Datapoint Type</th>
<th>Alarm range properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog input, analog output, analog value, pulse converter</td>
<td>High limit, low limit</td>
</tr>
<tr>
<td>Binary input, binary output, binary value, multi-state input, multistate value</td>
<td>Alarm value</td>
</tr>
</tbody>
</table>

For information on the detailed alarm behavior of a particular point type, please refer to the diagrams and descriptions in the following subsections.

**Transition Events**

Whenever the event state of a datapoint changes, an alarm is generated by one of the following transition events:

**Back To-Normal**
The alarm is going to normal operating state.

**To Off-Normal**
The alarm reaches off-normal state.

**To Fault**
The alarm originates in a (physical) fault such as sensor break, etc.

Any alarm caused by a transition event is indicated by the enabled ‘Alarm’ status flag (see "Datapoint Status Flags" section).
Alarm Display / Alarm Notification

A transition event is the triggering step that generates a notification which can be received by the BACnet client, the Eagle Web Interface or a 3rd party BACnet client for displaying alarms. To display a transition event of a datapoint on a BACnet client, the following steps must have been done:

- Enable reporting of the event transitions by selecting the desired transition event options in CARE (offline) or the BACnet client (online).
- Transition Events are: Back To-Normal, To Off-Normal, To Fault
- Select Notify Type “Alarm” in CARE (offline).
- Enable “High Limit” and “Low Limit” in CARE (offline) or in the Eagle Web Interface or via the BACnet client (online)
- Assigning a notification class to the datapoint (not necessary for the Eagle Web Interface, mandatory for BACnet client and 3rd party BACnet clients only).

Notification Class JOURNAL Usage

**IMPORTANT**

Any application that has been engineered by using the notification class JOURNAL will not lose it. After application upload into CARE, all notification classes which have been previously defined will be available in CARE for further engineering and download.

Datapoint Status Flags

The event state of a datapoint is indicated by the enabled/disabled status flags:

**In Alarm**
When enabled, the datapoint is in alarm. Cause can be faults and Off-Normal conditions.

**Fault**
When enabled, the datapoint or the physical input is not reliable, e.g. in case of sensor break (Open Loop). See “Status Flag Indications” for details.

**Overridden**
When enabled, the datapoint is in manual operating state. The value has been overwritten.
Out of Service
When enabled, this flag indicates that the physical datapoint is decoupled from the datapoint, e.g. in case of manual override for inputs. The present value displayed is not the present value, which would be delivered by the physical input.

NOTE: Multiple flag indications may be possible.

Example: A ‘To-Fault transition’ will also always enable the ‘In Alarm’ flag. Hence both, the ‘In Alarm’ and the ‘Fault’ status flags are enabled.

Alarm Buffer and Alarm Display
For the various datapoints, different triggering criteria must be fulfilled before an event is generated and reported (intrinsic reporting criteria). If all criteria are fulfilled, the event/alarm is generated and displayed in the alarm list. Depending on the datapoint type, the following three event types are described:

<table>
<thead>
<tr>
<th>Datapoint type</th>
<th>Event triggering criteria (intrinsic reporting criteria)</th>
<th>Event type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Binary Input Binary Value Multi-state Input Multi-state Value</td>
<td>If present value changes to a new state for longer than the time delay AND the new transition is enabled in the event transitions options for reporting</td>
<td>CHANGE OF STATE</td>
</tr>
</tbody>
</table>
| Analog Input Analog Output Analog Value Pulse Converter | If present value exceeds range between high limit and low limit for longer the time delay AND the new transition is enabled in the event transitions options for reporting and if high or low limit enable options are enabled  
OR  
Present value returns within the high limit - deadband to low Limit + deadband range for longer the time delay AND the new transition is enabled in the event transitions options for reporting and if high or low limit enable options are enabled  | OUT OF RANGE     |
| Binary Output Multi-state Output | If present value differs from feedback value for longer the time delay AND the new transition is enabled in the event transitions options for reporting
NOTE: ‘Feedback’ value will be supported in a future version of Eagle                                                                 | COMMAND FAILURE  |

Suppress Alarm Generation
If the alarm delay is set to 100,000 seconds or higher, the alarm will be suppressed. The ‘In Alarm’ flag and the ‘State’ will not change, even if the alarm conditions are reached. If the point is already in alarm state (Off-Normal) and the ‘In Alarm’ flag is set and the alarm delay is changed to 100,000 seconds or higher, the state of the point is set to ‘Normal’.

Only the alarm conditions can be disabled with the alarm delay of 100,000 seconds or higher.

The fault condition cannot be disabled with alarm delay.

Start Alarm Time
The start alarm time is the time during which the notification of alarms is suppressed. The start alarm time will become effective upon every start/restart of the Eagle controller, e.g. power-on, application start, etc. Entering a start alarm time is requested to prevent alarm shower at start/restart of the controller.

If alarms are still active after the start alarm time has elapsed, these alarms will be notified as usual.

Alarm Delay
Besides the datapoint’s specific alarm values, e.g. high and low limit of an analog input, the alarm delay is important for the alarm behavior of all datapoint types.

The alarm delay determines how long a ‘To-Off-Normal’ or ‘To-Normal transition’ must exist before an alarm is generated.
Alarm Settings and Alarm Display for Analog Inputs and Outputs

For analog inputs and outputs, the event states and transitions according to the BACnet standard can be as follows:

Besides the actual alarm value or alarm condition, the combination of the settings for intrinsic reporting (transitions) and Off-Normal conditions have a decisive influence on the alarm state displayed in the alarm buffer (BACnet client) and in the point dialog (see table):

<table>
<thead>
<tr>
<th>Selected Event Transition (Reporting)</th>
<th>Selected Off Normal Condition</th>
<th>Allowed Event Transitions</th>
<th>Event State (Alarm Buffer)</th>
<th>Event State (Point Dialog)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back To Normal</td>
<td>x</td>
<td>A→B</td>
<td>Normal</td>
<td>Normal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A→C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To Off-Normal</td>
<td>x</td>
<td>A→C</td>
<td>Off-Normal</td>
<td>Off-Normal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B→C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To Fault</td>
<td>x</td>
<td>A→B</td>
<td>Fault</td>
<td>Fault</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B→C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Limit Enable</td>
<td>x</td>
<td>A→C</td>
<td>Off-Normal</td>
<td>Off-Normal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A→C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low Limit Enable</td>
<td>x</td>
<td>A→C</td>
<td>Off-Normal</td>
<td>Off-Normal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A→C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For analog input and output points, the event state display of an analog input or output point in the alarm buffer and in the point dialog are not the same if the following settings have been set:

The "To Off-Normal" reporting and the Off-Normal Conditions "High Limit Enable" and "Low Limit Enable" are disabled.

Due to these selections, the following transitions (dashed in the following graphic) are not possible:
**Recommendation**

Set the high and/or low limits to extremely high or low values, so that a real measured value will not be above the limits. Always enable the High limit Enable and Low Limit Enable options even if the Off-Normal Reporting is disabled.

**Analog Input**

The following diagram shows the alarm behavior of an analog input.

![Diagram of Analog Input Alarm Behavior](image)

**Fig. 9.** Alarm behavior of analog input datapoint
Analog Output

The following diagram shows the alarm behavior of an analog output.

![Diagram showing alarm behavior of analog output](image)

Event Transition:
- TO_OFFNORMAL
- TO_NORMAL
- TO_OFFNORMAL
- TO_NORMAL

Event States:
- Normal
- HighLimit
- Normal
- LowLimit
- Normal

In Alarm:
- False
- True
- False
- True
- False

Note:
- Event reporting "To-Off-Normal" must be enabled.
- HighLimit-Enable must be checked for case A (high).
- Event reporting "To-Off-Normal" must be enabled and LowLimit-Enable must be checked for case B (low).
- Event reporting "To-Normal" must be enabled and HighLimit-Enable must be checked for case C (normal).
- Event reporting "To-Normal" must be enabled and LowLimit-Enable must be checked for case D (normal).

Fig. 10. Alarm behavior of analog output datapoint

Analog Value

The following diagram shows the alarm behavior of an analog value.

![Diagram showing alarm behavior of analog value](image)

Event Transition:
- TO_OFFNORMAL
- TO_NORMAL
- TO_OFFNORMAL
- TO_NORMAL

Event States:
- Normal
- HighLimit
- Normal
- LowLimit
- Normal

In Alarm:
- False
- True
- False
- True
- False

Note:
- Event reporting "To-Off-Normal" must be enabled.
- HighLimit-Enable must be checked for case A (high).
- Event reporting "To-Off-Normal" must be enabled and LowLimit-Enable must be checked for case C (low).
- Event reporting "To-Normal" must be enabled and HighLimit-Enable must be checked for case B (normal).
- Event reporting "To-Normal" must be enabled and LowLimit-Enable must be checked for case D (normal).

Fig. 11. Alarm behavior of analog value datapoint
Binary Input

The following diagram shows the alarm behavior of a binary input.

![Alarm behavior of binary input datapoint](image)

**Fig. 12. Alarm behavior of binary input datapoint**

Binary Output

The following diagram shows the alarm behavior of a binary output.

![Alarm behavior of binary output datapoint](image)

**Fig. 13. Alarm behavior of binary output datapoint**
Binary Value

The following diagram shows the alarm behavior of a binary value.

![Diagram showing alarm behavior of binary value]

Multi-state Input

The following diagram shows the alarm behavior of a multi-state input.

![Diagram showing alarm behavior of multi-state input]
Multi-state Output

The following diagram shows the alarm behavior of a multi-state output.

Fig. 16. Alarm behavior of multi-state output datapoint

Multi-state Value

The following diagram shows the alarm behavior of a multi-state input.

Fig. 17. Alarm behavior of multi-state value datapoint
Pulse Converter

The following diagram shows the alarm behavior of pulse converter.

![Diagram of alarm behavior of pulse converter](image)

Fig. 18. Alarm behavior of pulse converter datapoint
The notification class manager in CARE is used for adapting the alarming to the BACnet client and 3rd party BACnet clients according to the requirements.

This is done by creating, editing and deleting notification class objects. Notification class objects will be assigned to datapoints in order to enable alarming for datapoints.

Notification class objects represent and contain information required for the distribution of event notifications within a BACnet system. Notification Classes are useful for event-initiating objects that have identical needs in terms of how their notifications should be handled, what the recipient(s) for their notifications should be, and how they should be acknowledged.

A notification class defines how event notifications shall be prioritized in their handling according to TO-OFFNORMAL, TO-FAULT, and TO-NORMAL events; whether these categories of events require acknowledgment (nearly always by a human operator); and what recipient devices (e.g. Eagle Web Interface, BACnet client) or processes should receive notifications.

The purpose of prioritization is to provide a means to ensure that alarms or event notifications with critical time considerations are not unnecessarily delayed. The possible range of priorities is 0 - 255. A lower number indicates a higher priority. Priorities may be assigned to TO OFF-NORMAL, TO FAULT, and TO NORMAL events individually within a notification class.

In CARE, the alarms/event notifications are prioritized by default as follows:

<table>
<thead>
<tr>
<th>Event / Alarm Category</th>
<th>To Normal</th>
<th>To Off-Normal</th>
<th>To Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urgent (range 0…84)</td>
<td>83</td>
<td>0</td>
<td>42</td>
</tr>
<tr>
<td>High (range 85…169)</td>
<td>168</td>
<td>86</td>
<td>127</td>
</tr>
<tr>
<td>Low (range 170…250)</td>
<td>250</td>
<td>171</td>
<td>210</td>
</tr>
</tbody>
</table>

NOTE: The CARE ranges slightly differ from the event / alarm priority ranges defined in the BACnet standard which affects the associated network priority (see “Alarm and Event Priority Classification” section below).

The transitions have the following denotation:

**Back To-Normal**
The alarm is going to normal state, that is, the value of the datapoint remains under the high limit, or exceeds the low limit.

**To Off-Normal**
The alarm reaches off-normal state, that is, the datapoint value exceeds the high limit, or remains under the low limit.

**To Fault**
The alarm originates in a fault such as sensor break, etc. See “Point Flag Indications” for details.

The purpose of acknowledgment is to provide assurance that a notification has been acted upon by some other agent, rather than merely having been received correctly by another device. In most cases, acknowledgments come from human operators.

TO OFF-NORMAL, TO FAULT, and TO NORMAL events may, or may not, require individual acknowledgment within a notification class.

It is often necessary for event notifications to be sent to multiple recipients or to different recipients based on the time of day or day of week. Notification Classes may specify a list of recipients, each of which is qualified by time, day of week, and type of handling. A recipient is specified by a set of days of the week (Monday through Sunday) during which the recipient is considered viable by the Notification Object Types
Class object. In addition, each recipient has a FromTime and ToTime, which specify a window, on those days of the week, during which the recipient is viable. If an event that uses a notification class object occurs and the day is one of the days of the week that is valid for a given recipient and the time is within the window specified for the recipient, then the recipient shall be sent a notification. Recipients may be further qualified, as applicable, by any combination of the three event transitions TO OFF-NORMAL, TO FAULT, or TO NORMAL.

The recipient also defines the device to receive the notification and a process within the device. Processes are identified by numeric handles that are only meaningful to the recipient device. The administration of these handles is a local matter. The recipient device may be specified by either its unique Device Object Identifier or its BACnet Address. In the latter case, a specific node address, a multicast address, or a broadcast address may be used. The recipient further specifies whether the notification shall be sent using a confirmed or unconfirmed event notification.

How the notification class assignment is handled in CARE: please see the following graphic.

### Notification Classes and Event Handling

#### HTML Interface

- **Datapoint**
  - Analog Input
- **Alarming (Notification)**
  - Urgent
  - High
  - Low
- **Timestamp**
  - To-Normal
  - To-Fault

#### CARE

- **Notification Class**
  - Urgent
  - High
  - Low
- **Transition Event**
  - To-Normal
  - To-OffNormal
  - To-Fault

#### Client

- **Recipient A**
  - Notification = High
  - Transitions: To-OffNormal, To-Fault, To-Normal
- **Recipient B**
  - Notification = High
  - Transitions: To-OffNormal, To-Fault, To-Normal

**Fig. 19. Notification classes and event handling**

### Alarm and Event Priority Classification

Alarms and events traversing the BACnet network need prioritization to assure that important information reaches its destination and is acted upon quickly. To assure alarm prioritization at the network level, the network priority as defined in the network layer protocol control is set automatically according to the alarm and event priority settings. The following table shows the alarm and event priorities classifications including semantic meaning.

<table>
<thead>
<tr>
<th>Message Group</th>
<th>Priority Range</th>
<th>Network Priority</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life Safety</td>
<td>00 – 31</td>
<td>Life Safety</td>
<td>Message Notifications related to an immediate threat to life, safety or health such as fire detection or armed robbery</td>
</tr>
<tr>
<td>Property Safety</td>
<td>32 – 63</td>
<td>Life Safety message</td>
<td>Notifications related as an immediate threat to property such as forced entry</td>
</tr>
</tbody>
</table>
## Message Group | Priority Range | Network Priority | Description
--- | --- | --- | ---
Life Safety | 00 – 31 | Life Safety | Message Notifications related to an immediate threat to life, safety or health such as fire detection or armed robbery.
Supervisory | 64 – 95 | Critical Equipment Message | Notifications related to improper operation, monitoring failure (particularly of Life Safety or Property Safety monitoring), or monetary loss.
Trouble | 96 - 127 | Critical Equipment message | Notifications related to communication failure (particularly of Life Safety or Property Safety equipment).
Miscellaneous Higher Priority Alarm and Events | 128 - 191 | Urgent message | Higher-level notifications related to occupant discomfort, normal operation, normal monitoring, or return to normal.
Miscellaneous Lower Priority Alarm and Events | 192 - 255 | Normal message | Lower-level notification related to occupant discomfort, normal operation, normal monitoring, or return to normal.

### TIME PROGRAMS

#### Schedules and Calendars

Time programs comprise schedules and calendars.

**Schedules**

Schedules are daily and weekly time programs. Whenever you want, you can use schedules to enter the setpoint or status for any datapoint.

Schedules are assigned to plants. Each plant of a controller can have multiple schedules assigned and each schedule can command datapoints of that plant.

Each schedule specifies a list of datapoint properties to command (switchpoints) on a weekly basis. The week program defines the normal daily activity of the system by specifying which switchpoints are to be commanded each day of the week. The week program applies to a definable time period. There is only one week program per schedule.

Schedules offer 16 write priorities that define the priority for writing to the present value of output and value datapoints. Note, that only the priorities 9 to 16 are allowed in the controller.

Besides the week program, specific programs called exceptions can be created. Exceptions have higher priority than the week program and will overwrite the week program for a definable time period. Exceptions can have four different time periods:

- **Specific Date**
  - e.g. Christmas Eve or 5.5., the whole of May, or the whole year of 2004
- **Date Range**
  - e.g. Summer holidays from 29.7-7.9.2004
- **Recurring Event**
  - e.g. every last Friday of every month
- **Calendar Reference**
  - A project-wide calendar provides dates, e.g. regional holidays and public-religious festivals or any other particular date. The time period can be a specific date, a date range or a recurring event.

**Calendars**

Calendars are assigned to a whole project. They contain exception days or periods, e.g. Christmas, holidays.
If controller schedules are referring to the same calendar(s), project wide scheduling is possible for these controllers, because calendar dates are executed in each controller of the project, which has references to the calendar. Changes in multiple particular controller schedules can be quickly made by simply changing the referenced calendar(s).

**Switchpoints / Switched Properties**

By default, the property ‘present value’ is assigned to a datapoint. Hence, when switching a datapoint, the present value of the datapoint is switched. This is the standard case. In addition, in enhanced case, multiple datapoints and or other properties than the present value can be switched.

---

**Fig. 20. Schedules and Calendars**
TRENDING

Trending can be performed via the Excel Web II HTML Interface residing on any PC platform and via BACnet clients. Trend data is stored on the integrated Flash via "Trend-log" objects. 3 Trend-log objects are set up by default for the BACnet and LON statistics in the Excel Web II controller. 497 trend objects can be set up freely. Per Trend-log object 10,000 trend records can be stored on the integrated Flash. Trend data storage can be in 'Ringbuffer' mode or in 'Stop When Full' mode. Trend data are dynamically created in the controller and can be saved and downloaded as a .CSV file.

Trend data have unlimited lifetime and survive a firmware download under the following precondition:

- The trend object(s) must have been active at least 80 seconds before a firmware download is executed, because only every 80 seconds online changes like trends are saved into the Flash memory.

Trend objects must be explicitly deleted via Eagle Web Interface or BACnet. This deletes also the corresponding trend records. The trended object may be a local or a reference point in the same controller and the trended property may be integer or floating point, e.g. point value, point state, alarm limit, time stamp.

PLANTS

The Eagle application can comprise several plants. This is defined in the CARE programming tool.

Plants are typically defined to match the controlled application, e.g. Air Conditioning Plant, Boiler Room, Chillers, etc.

On plant level you can shutdown and restart the application which is running in the corresponding controller. This is possible via the Eagle Web Interface and via BACnet. In the Eagle Web Interface also the latest start and stop date is displayed.

CONTROL LOOPS

The data processing of the controller is programmed in control loops. Authorized users, using the CARE software, define them. A control loop receives the input values from sensors and other hardware or software components. The controller calculates with these values and determines if a regulation is necessary. In such a case, the controller initiates the predefined reaction by switching the connected hardware or software.

There are three types of control loop functions:

- Functions
  Functions are basic logic elements with which you can build macros. They cannot be created, edited or removed.

- Macros in a plant
  Macros are software modules programmed from functions. Macros in a plant are available in a single plant. It is up to the user to create, edit or remove such macros. The same macro can be used many times in a plant. If a macro in a plant is changed, the macro change will appear in all instances of the macro in this plant, but not in other plants.

- System Macros
  Honeywell provides system Macros. They are available for all projects of the Database. These macros are protected against editing and removing.

- Library Macros
Library Macros are project independent macros created by the user. The same macro can be used many times in a library. If a macro in a library is changed, the macro change will appear in all instances of the macro in this library, but not in other libraries.

**Parameters**

Parameters are used for configuration and tuning of the application program via control loops. A typical example of a parameter is the Integral Time of the PID control function.

Parameters are part of a control icon which itself is part of a control loop which itself is part of a plant, etc. Hence, the parameter can be described and addressed by its path as follows:

plant – control loop – control macro - control icon – parameter

Example: airconditioning.contloop1.supply_temp.integral time

A parameter is defined by:

- Name
- Value
- Engineering unit/state text (in the Eagle Web Interface only supported for control macros, not for control functions)

**Cycle Time Category**

The cycle time category defines the time in ms after a control loop is restarted automatically. To view/set cycle time categories, please refer to the "View/Change Cycle Time Categories" section.

**SYSTEM SETTINGS**

System settings include the following settings:

- System date, time and time zone
- Cycle time category (see also "Cycle Time Category" section).
- Communication settings

**Communication Settings**

Communication settings include:

- Interface settings for Ethernet, LON, and Web-Server, such as IP address, neuron chip ID, automatic logout time of web server
- User name and password definition
- Selection of remote front-end
- Dial out parameter (re-dial algorithm) definition

**Diagnostics**

Diagnostics allow trending and display of LON specific parameters such as:

- Transmission errors
- Lost messages
- Collisions
- Etc.

For trending LON parameters, basic settings such as start and stop time, trend buffer values and enable/disable logging are defined.
Diagnostics also allow BACnet diagnostic (MS/TP statistics) by showing the actual communication status on the BACnet bus and search for BACnet objects and identifiers.

---

**EMAIL ALARMING**

**Purpose**
Sending an email to a definable email-recipient in case of alarms of selectable datapoints. Alarms may be generated for each datapoint that has the appropriate notification class assigned and the alarm reporting enabled. The email includes an attachment (.TXT) that shows a detailed description of the alarm data, for example:

```
Democase_Controller
http://192.168.200.10
URGENT (193)
Outdoor_Temperature
2008-March-12 We 14:29:16
Notify Type: Alarm
Event Type: Out Of Range
Description: Smart_IO_AI2
Present Value: 50 °C
Low Limit: 3 °C - High Limit: 40 °C
```

**Steps**
Setting up the email alarming process includes the following major steps:

**In CARE**
- Enter E-Mail alarming properties
- Connect to controller
- Translate and download application
- Download controller settings

For information on the procedure, please refer to the CARE User Guide, EN2Z-0970GE51.

**In the Eagle Web Interface**
1. Assign email address to the user that receives the alarm email(s) (recipient)
2. Assign email address (recipient) to the notification class
3. Define alarming conditions for datapoint(s) that should send alarm emails
4. Send Test Email

NOTE: Steps 1 through 3 can also be done in CARE

For detailed information on the procedure, please refer to “Email Alarming” in the “Operating the Eagle Web Interface” section.

---

**EVENT ENROLLMENTS**

**Event Enrollment Objects / Algorithmic Change Reporting**

**Event Enrollment Objects**
The primary purpose for Event Enrollment objects is to define an event and to provide a connection between the occurrence of an event and the transmission of a notification message to one or more recipients. The Event Enrollment object contains the event-type description, the parameters needed to determine if the event has occurred (Algorithmic Change Reporting), and a device to be notified. Alternatively, a Notification Class object may serve to identify the recipients of event notifications. A device is considered to be "enrolled for event
Algorithmic Change Reporting

Algorithmic change reporting enables a BACnet device to provide one or more alarm or event sources, defined by Event Enrollment objects, to generate alarm or event notifications that may be directed to one or more recipients. Any of the standardized algorithms may be used to establish criteria for change reporting. Once established, occurrences of change may be reported to one or more recipients based on further criteria. Changes of value of specific properties of an object may be programmed to trigger event notifications to be sent to one or more recipients based on a notification class. Typically, event notifications are sent to application programs represented by processes within a notification-client device. The object(s) whose properties are referred to is known as the Reference Object(s). The criteria used to ascertain that an event has occurred are determined by the Event Type, for example, CHANGE OF BITSTRING, CHANGE OF STATE etc.

The Eagle Web Interface allows enabling event enrollments for

- **Plant**  
  See “Enable Event Enrollment Alarming for Plant” in the “Operating the Eagle Web Interface” section.
- **Controller**  
  See “Enable Event Enrollment Alarming for Controller System Status” in the “Operating the Eagle Web Interface” section.
- **Datapoints**  
  See “View / Edit Event Enrollment Alarming” in the “Operating the Eagle Web Interface” section.
- **Email alarming**  
  See “Enable Event Enrollment Alarming for Controller Email Alarming” in the “Operating the Eagle Web Interface” section.
OPERATING THE EAGLE WEB INTERFACE

Start Eagle Web Interface

Prerequisites
The PC platform hosting the Eagle Web Interface must be physically connected to the controller as described under "Access Modes to Eagle Controller" in the "System Overview" section.

Procedure
1. Start your web browser

   NOTE: Depending on the CARE IP port settings (see "Define BACnet IP Bus Properties" section in the CARE User Guide), you are logging in via HTTP (Port 80 enabled) or via HTTPS (ports 80 and 443 enabled). When logging in via HTTPS, please refer to the subsequent "Login via HTTPS" section after finishing with this section.

2. In the address field of the web browser, enter the IP address of the controller you want to operate.

   RESULT: The Login page is displayed.

3. From the Controller drop-down listbox, select the controller. Any controller that has alarms is red colored and blue highlighted. The alarm indicator icon shows whether alarms are on the BACnet bus (red) or not (green).

4. In the User Name field, enter your user name, or select the user name from the drop-down listbox (only selectable if the Enable Comfortable Login option was enabled in the CARE project, see also step 6).

5. In the Password field, enter your password.

   NOTE: For the user ‘Guest’ or ‘guest’, login is no longer possible using the unsecure passwords ‘Guest’ or ‘guest’ or blanks (no password).

6. If the Enable Comfortable Login option was enabled in the CARE project, the Remember Me check box is available. Check this option if you want to login next time without the necessity to enter user name and password again.
CAUTION
If checked, make sure that the controller is operated in a closed network or VPN to avoid misuse through cyber attacks or easy login by other persons not knowing your password and user name.

7. Click the LOGIN button.

RESULT: The Main screen of the Eagle Web Interface displays.

Login Retry Limits

<table>
<thead>
<tr>
<th>Browser login retry limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 sec wait time after five wrong inputs.</td>
</tr>
<tr>
<td>If an input (correct or false) is done during the 60 sec wait time, 60 sec wait-time starts again.</td>
</tr>
<tr>
<td>FTP login retry limit</td>
</tr>
<tr>
<td>300 sec wait time after five wrong inputs.</td>
</tr>
</tbody>
</table>

Login via HTTPS

With CARE 10.05.00 and higher you can define a certificate for the Excel Web II controller and download it into the Excel Web II. A certificate allows communication via the HTTPS standard which provides a higher cyber security level for communication.

SECURITY NOTICE!

These certificates are self-defined end-entity certificates, which the Excel Web II is signing and hence are insecure and not comparable to trusted certificates from certification authorities.

When accessing the controller via web browser, there are 4 options how certificates are applied and handled:

HTTPS

<table>
<thead>
<tr>
<th>Trusted CA-signed certificates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use of IP ports 443 and 80. Automatic re-direct to HTTPS. Recommended.</td>
</tr>
</tbody>
</table>

SECURITY NOTICE!

This kind of certificate is recommended for internet facing controllers.
Self-signed controller certificates
Use of IP ports 443 and 80. Automatic re-direct to HTTPS.

Self-signed root certificate and derived controller certificates
Use of IP ports 443 and 80. Automatic re-direct to HTTPS.

SECURITY NOTICE!
Self-signed certificates must not be used for internet-facing controllers, because they are not secure. Users may consider using self-signed certificates in secured networks, like VPN or closed networks, based on their own security assessment.

HTTP
Use of IP port 80. Non-repudiation. Not recommended, but HTTP is necessary for special HTTP access solutions, that are not using web-browsers and therefore cannot handle certificates.

Depending on the used browser, the steps are different when working with certificates.

In the following, the HTTPS options are described.

---

**Trusted CA-signed Certificates**

SECURITY NOTICE!
This kind of certificate is recommended for internet facing controllers.

Procedure

1. Setup a full qualified domain name for the controller, e.g. CPU1.customer.com. This is typically done by applying your own dynamic DNS server.

2. Organize the CA certificate from the certification authority which includes the following tasks:
   a. Create CSR = Certificate Signing Request
   b. Answer verification email (domain validation)
   c. Receive certificate & private key

3. Access the controller via browser login using HTTPS.

4. Install the CA certificate via browser (see "Web Server Certificates" section). This includes:
   - CA intermediate certificate + controller certificate + private Key

NOTE: Because the web browser connection is not secure at the time of the installation (download), it is recommended to access the browser via the local USB-B port connection of the controller.

For further detailed information on CA-signed certificate handling, please refer to common literature about Certificates, e.g. the X.509 cryptography standard.

---

**Self-signed Controller Certificates**

SECURITY NOTICE!
Self-signed certificates must not be used for internet-facing controllers, because they are not secure. Users may consider using self-signed certificates in secured networks, like VPN or closed networks, based on their own security assessment.

Self-signed controller certificates are handled in one of the following ways:

- Certificate automatically created at controller start-up. The application with IP address must be loaded.
Certificate information is defined in CARE. The information must be that of the network domain owner.

Certificate created using any OpenSSL tool (e.g. XCA). The certificate consists of a private key, root certificate and a derived certificate. The root certificate must be imported into the web browser. The derived certificate must be downloaded into the controller.

NOTE: Because the web browser connection is not secure at the time of the download, it is recommended to access the browser via the local USB connection of the controller.

Procedure

1. In CARE, create the certificate. This triggers the controller to create the certificate and the private key.

2. Access the controller via browser login using HTTPS.

   RESULT: The web browser does not accept the self-signed certificate and displays a warning. You must accept and install an untrusted certificate.

3. Accept the warning and install the untrusted certificate.

   RESULT: The behavior and URL display depends on the used browser and its version. But, in every case, HTTPS communication will be established and encryption is enabled.

4. In the following, for Internet Explorer, Chrome and Firefox.

   Internet Explorer Browser and Self-signed Certificates Handling

   When the following message displays in Internet Explorer after login, click Continue to this website (not recommended).

   ![Internet Explorer Certificate Warning]

   In the following screen, click View certificates.
In the Certificate dialog box, click Install Certificate.

Confirm the following message box by clicking OK.
After successful import, the "Certificate Error" warning remains and the URL is displayed in red.

Chrome Browser and Self-signed Certificates Handling

When the following message displays in Chrome after login, click Advanced.
In the following screen, click **Proceed to <IP address> (unsafe)**.

In the address line, the warning remains after acknowledgement. The URL displays "disabled https in red" but encryption is working.
Firefox Browser and Self-signed Certificates Handling

When the following message displays in Firefox after login, click I Understand the Risks.
In the following screen, click Add Exception.

- **Technical Details**

  10.108.255.241 uses an invalid security certificate.
  
  The certificate is not trusted because it is self-signed.
  
  (Error code: sec_error_unknown issuer)

- **I Understand the Risks**

  If you understand what’s going on, you can tell Firefox to start trusting this site’s identification. Even if you trust the site, this error could mean that someone is tampering with your connection.

  Don’t add an exception unless you know there’s a good reason why this site doesn’t use trusted identification.

  [Add Exception...]

In the Add Security Exception dialog box, click **Get Certificate**, and select the certificate.
Then, confirm by clicking **Confirm Security Exception**.

After successful addition, the URL displays "https" on white background.
Self-signed Root Certificate and Derived Controller Certificates

SECURITY NOTICE!
Self-signed certificates must not be used for internet-facing controllers, because they are not secure. Users may consider using self-signed certificates in secured networks, like VPN or closed networks, based on their own security assessment.

Procedure
1. By using an OpenSSL Tool (e.g. XCA), create a root certificate and derived certificate(s) for the controller(s).
2. Download the derived certificate(s) and the private key into the controller(s).
3. Download the root certificate into the web browser.
4. Access the controller via browser login using HTTPS.

RESULT: HTTPS communication will be established without warning.

User Tasks Overview for Different Certificates

The following table shows the various tasks to be done by the user dependant on the applied certificates.

<table>
<thead>
<tr>
<th>CA-Certificate</th>
<th>Self-Signed Certificate</th>
<th>Self-Signed Root Certificate and Derived Controller Certificates</th>
</tr>
</thead>
<tbody>
<tr>
<td>First browser contact to controller</td>
<td><strong>MUST NOT BE USER FOR INTERNET FACING CONTROLLERS!</strong></td>
<td></td>
</tr>
<tr>
<td>New controller, or controller upgrade</td>
<td><strong>Domain Owner:</strong> Organize controller certificate and download it into controller</td>
<td></td>
</tr>
<tr>
<td>Changed controller IP address</td>
<td><strong>CARE User:</strong> Create controller certificate</td>
<td></td>
</tr>
<tr>
<td>Certificate expired</td>
<td><strong>Web User:</strong> Acknowledge risk warning Import certificate into browser</td>
<td></td>
</tr>
<tr>
<td>Controller private key compromised</td>
<td><strong>Domain Owner:</strong> Create root certificate and derived controller certificates Download certificates into controller and browser</td>
<td></td>
</tr>
</tbody>
</table>
Main Screen Description

The Main screen provides two basic panes, the controller selection pane and the information and editing pane (see next page).

Controller Selection Pane (see next page)
The controller selection pane on the left (in the following just named tree) displays the application of the current controller in a hierarchical tree structure. From the Controller Selection drop-down list on the top, the controller can be selected among all controllers residing on the network. Any controller which has alarms is marked in red. The alarm indicator icon next to the drop-down listbox indicates whether alarms exist (red) on the BACnet bus or not (green).
**Information and Editing Pane (see next page)**

The right pane shows the properties of the selected item, which may look very different depending on the selected item. For example, it may show project information, a datapoint list, or any of the details of the Advanced tree.
Sizing the Pane Displays
The size of the pane display can be varied by moving the red separator horizontally to the left or right.

Tree Navigation
You can navigate through the tree by clicking on tree items, or by clicking the plus-/minus icons at the tree items.

Viewing and Editing Information
To view or edit data and properties of an item, select an item by clicking on the item in the tree.

On the right pane, the corresponding data and properties of the selected item are displayed. In the tree, the selected item is marked red.

In the headline, the path (separated by dots) of the selected item is displayed.
NOTE: Some items, for example ‘Advanced’ may not have properties and data for display on the right pane.

**Footer**
In the footer on the bottom the following functions are available:

- **Language**
  From the **Language** drop-down list box, select the language the Eagle application should use.

  If a language is missing, please ask you Honeywell representative if your desired language can be provided.

- **Refresh**
  From the **Refresh** drop-down list box, select the value for automatically refreshing data in the Eagle application. A manual instant refresh can be done by clicking the **Refresh** icon right from the **Refresh** drop-down list box.

  **NOTE:** If you use the ‘Refresh’ command of the Internet Explorer, you will need to login in to the Eagle controller again.

- **Logout**
  By clicking the **Logout** icon, you can logout.

- **Date and Time display**
  Shows the current date and time in country-specific format

- **Alarm Status display**
  Shows the number of alarms (new/total) and the alarm status. The alarm icon on the right indicates alarms as follows:
  - Blinking red = new and unviewed alarms exist
  - Constantly red = alarms have been viewed but alarm conditions still exist
  - Constantly green = no alarm conditions exist
The alarm numbers will only be refreshed if the Refresh function is active.

**Context Sensitive Online Help**
Clicking on the Help icon displays information on the corresponding area.

---

**Basic Functions**

The properties of a selected item in the tree, for example, Fast Access Lists, are displayed on tabs on the right pane.

Data can be modified by clicking the appropriate buttons, such as NEW, DELETE, COPY etc.

When hovering over a list item with the mouse-cursor, the item will be highlighted in red and underlined.

A green item in a list indicates that this item links to a further dialog showing more details of the item.

By clicking on the item, you can edit details of the selected item.

For each button, a tool tip is provided which will be visible while the cursor remains over the button for a few seconds.

**Updating Data (Refresh)**
The default time interval for data updates can be defined by selecting the desired value in the Refresh drop-down list box in the footer (see Footer description in the Main Screen Description section).
A manual instant refresh of the data can be done by clicking the Refresh icon right from the Refresh drop-down list box. The same functionality is available in certain dialogs, e.g. in the datapoint details dialogs. In this case you can define different update intervals for several datapoint types. In addition, the manual instant refresh is possible.

### Saving Data
Saving and discarding changed data is handled by using the following buttons (dependent on the dialog):

- **Submit** / **OK**
  Saves changes done in the current dialog

- **Close** / **Cancel**
  Discards changes done in the current dialog

### Viewing / Hiding Filter Options
For datapoints, parameters, alarms, and schedules, the filter dialog options can be made visible or hidden by toggling the combined down arrow / up arrow icon.
Filter Options visible

Further Button Functions

[Browse] (Browse)
This button opens, for example, the Sort Order dialog where you can define the sort order for lists.
Or, for example, it opens a calendar for picking a date.
Those kind of specific buttons perform functions as the button name indicates in its functional context. For example, the NEW button on the Fast Access Lists tab creates a new fast access list.

Multiselection of Items

Clicking the checkbox in the title line of a list,

Simultaneously selects all entries in the list.

In particular dialogs, multiple items can be selected by using the SHIFT or the CTRL key simultaneously with the mouse clicking.

Configure List Display

Entries per page

This option allows setting the number of entries to be displayed in a list. Small values enable you to quickly view a small number of entries. Large values enable you to get an overview of a long list but with decreased performance.
By clicking on a specific page number you can display certain pages and/or by using the \( \leq \geq \) icons you can scroll through the list.

---

### User Administration

Please refer also to the general "User Administration" section, p. 19.

---

### Invoke User Administration

**Procedure**

1. In the tree, expand the Advanced item and click on **User Administration**.

**RESULT:** On the right, the **User** tab displays showing all existing users.

On the **User** tab, users can be newly created, edited and deleted. In addition, the user's password can be changed. By default the SystemAdmin and the Guest users are already available. For each user, the following properties are shown:

- User Name
- Access Level
- Language Preference
- Decimal Places
- E-Mail Addresses

On the **Access Rights** tab, the access rights for all users will be defined by assigning the predefined user levels to the executable functions (see Create Access Rights section).
Create Access Rights List

NOTE: Only the user who has System Admin or Project Admin user level can create or edit access rights. The System Admin level is automatically assigned to the user who has created the project initially in CARE.

Procedure

1. Select the Access Rights tab.

2. To each function described in the Description column, assign the appropriate user level by selecting it in the corresponding line in the User Level column.

Note that the user levels are arranged hierarchically with the following sequence of descending priority:

- System Administrator (128) = highest priority
- Project Administrator (115)
- Building Engineer (96)
- Operator (64)
- Tenant (32)
- Guest (0) = lowest priority

3. Click SUBMIT button to save settings.

4. To create a new user, continue as described under the "Create User" section.

Create User

NOTE: Only the user who has System Admin user level can create users, edit, or delete existing users.

Procedure

1. Select the User tab.

RESULT: The New / Edit User Profile dialog box for creating a new user profile displays.

2. Click the NEW button.

RESULT: The New / Edit User Profile dialog box for creating a new user profile displays.

3. In the User Name field, enter the user name.
4. In the **Password** field, enter the password for the user.

5. In the **Confirm Password** field, confirm the new password by entering the password again.

6. In the **HMI Pin** field, enter a 4-digit pin number the user should enter in order to access the BACnet controller via Onboard HMI.

7. In the **Confirm HMI Pin** field, confirm the pin by entering the same number.

8. From the **Access Level** drop-down list box, select the user level.

   Note that the user levels are arranged hierarchically with the following sequence of descending priority:

   - System Administrator (128)
   - Project Administrator (115)
   - Building Engineer (96)
   - Operator (64)
   - Tenant (32)
   - Guest (0)

   Due to the access rights list definitions (see "Create Access Rights" section), this assignment automatically determines the set of access rights, which the user is allowed to execute in the Eagle Web Interface.

9. From the **Preferred Language** drop-down list box, select the language in which the Eagle Web Interface should be displayed for the user. If information is not available in the user's preferred language, the controller will send the information in the default language, defined in CARE. After logging in, the Eagle Web Interface is displayed in the user's preferred language.

   **Date Format**
   Displays the date format. It may be either dd.mm.yyyy or mm/dd/yyyy. The controller stores the date format along with the language setting.

   **Time Format**
   Displays the time format. The controller stores the time format along with the language setting.

10. From the **Decimal Places** drop-down list box, select the number of decimal places for the display of values.
10. To create an email address for the user for receiving email alarms created by the Eagle controller, click **New** button.

![New E-Mail Address dialog box]

11. In the New / Edit Address Entry dialog box, enter the email address, and then click OK.

   **NOTE:** You can enter max. 5 email addresses per user.

   **RESULT:** The email address is created and displayed in the New / Edit User Profile dialog box.
12. Click OK button to save settings.

RESULT: The created user is displayed on the Existing Users tab.

NOTE: Only the user who has System Admin user level can create new users and edit or delete existing users. The user name cannot be changed.

Procedure
1. On the User tab, click on the user in the User Name column.
RESULT: The New / Edit User Profile dialog box displays.

2. If desired, change the user level by selecting another level from the **Access Level** drop-down list box.

   When changing the user level, note the sequence of descending priority of user levels:
   - System Administrator (128)
   - Project Administrator (115)
   - Building Engineer (96)
   - Operator (64)
   - Tenant (32)
   - Guest (0)

   If the user level has been changed, you should note the current access rights definitions on the **Access Rights** tab in the **User administration** dialog box.
3. To change the password, click the **Password** button, and then change the password in the Change Password dialog box.

4. Click OK in the Change Password dialog box.

5. If desired, change the language in which the Eagle Web Interface should be displayed for the user by selecting another language from the **Preferred Language** drop-down list box. If information is not available in the user’s preferred language, the controller will sent the information in the default language, defined by the CARE engineering tool. After logging in, the Eagle Web Interface is displayed in the user’s preferred language.

   **Date Format**
   Displays the date format. It may be either dd.mm.yyyy or mm/dd/yyyy. The controller stores the date format along with the language setting.

   **Time Format**
   Displays the time format. The controller stores the time format along with the language setting.

6. If desired, change the number of decimal places for the display of values in the Eagle Web Interface by selecting another value from the **Decimal Places** drop-down list box.

7. If desired, create an email address for the user by clicking the **New** button (details, see “Create User” section). Or, delete the email address of the user by selecting the email address and then clicking the **Delete** button.

8. Click the OK button to save settings.

**User Data Synchronization**
CARE will synchronize user definitions made online in the Eagle Web Interface with the CARE database when the controller application is uploaded with CARE.

---

**Delete User**

**NOTE:** Only the user who has System Admin user level can create new users and edit or delete existing users.

**Procedure**

1. On the **User** tab, select the user you want to delete by clicking the corresponding radio button in the first column.

2. Click the **DELETE** button.

**RESULT:** The user is deleted from the list.

---

**Display Project Information**

**Procedure**

1. In the tree on the left, click on the project which is the top-level tree item.
RESULT: On the Project tab on the right, Project Information is displayed with the following properties:

- Project Name
  Name of project, for example, site location
- Reference Number
  A number that further describes the project. For example, branch number
- Description
  Default Text about the project that may help to identify it.
- Customer
  Customer name
- Order Number
  Number assigned to project order
- Project Administrator
  Name of responsible project engineer
- Units of Measurement
  International or Imperial (English). This selection affects the operation of the icons in Control Strategy that perform EMS operations. The values for the inputs and outputs are different depending on the selection of International or English units.
- Character Set
  The appropriate character set is necessary for unobstructed communication between devices on the BACnet bus. For proper communication between Eagle controllers and the BACnet client, the ANSI (or ISO Latin I) character set must have been selected in CARE.

Display Controller Information

Procedure 1. In the tree on the left, click on the controller.

RESULT: On the General tab on the right, general controller data are displayed:
Controller Information
Shows controller specific properties such as:

- Controller Family
- Controller Model
- Controller Name
- Device ID
  Object identifier of the BACnet device object. This is a unique ID issued by CARE for any device on the BACnet bus. If the BACnet device is an Eagle controller, the device ID is the same as the controller number.

  NOTE: When integrating 3rd party BACnet devices, it must be ensured that no identical device IDs exist in the whole BACnet system. For that reason, an offset can be defined. Adding this offset to the controller number generates the device ID.

- Location
  Additional Text for the controller, which indicates the location of the controller, e.g. Floor 4, Section Nord.

- SKU Number
  OS number

- Serial Number

- Memory Size (RAM / ROM)

- Description
  Additional descriptive text

- System Status
  DEV_OPERATIONAL, which means the controller is operating
Miscellaneous
- Manufacturing location
  Factory where the controller has been produced
- Manufacturing week
  Week when the controller has been produced

Ethernet
Shows network specific properties of the IP address allocation mode:
- Use this IP address for LAN Access
  IP address, subnet mask and gateway address have been allocated explicitly in CARE.
- MAC address 1
  shows MAC address 1
- MAC address 2
  shows MAC address 2

LON Bus
Shows LON specific properties of the controller such as:
- Neuron Chip ID
  Displays neuron ID of the controller.
- Subnet-Node Address Domain 0
  Displays subnet/node address of domain 0 as defined in CARE
- Subnet-Node Address Domain 1
  Defaults to zero.

2. To view Version information of the controller, click the Versions tab.
Version data includes:

**Controller Related Data** such as:
- Controller Name
- SKU Number
- Firmware Version
- Object Synchronization Version
- Linux Image Version
- BACnet Stack Version
- PHP Version
- Web Server Version
- Web Pages Version

For all data except object synchronization version, the date of the last download is shown right to the item.

**Application Related Data** such as:
- Appl. Software Version
- Last Download (date and time)
- Tool Name (used for application creation)
• Tool Version
• Application Files
  The application is stored in different files for plants, loops, controllers etc. Each file has a name, type (data type), version (controller), sequence (version of application file) and date.
  Version indicates the firmware version.
  Type indicates which Object Types are contained in the application file.
  Sequence indicates online changes, e.g. of Quick Access Groups, Parameters, User Administration etc. With every online change, the sequence number is incremented.
  Last Saved indicates the time when this application file was created in the CARE tool (time of last CARE translation) or when the file has been saved due to an online change.

3. To view licensing information of the controller, click the licensing tab.

Licensing data includes:

**License Related Data** such as:

• Controller Family
• Controller Model
• SKU Number
• Serial Number
• License File Creation Date
• Status
  OK = license files status is OK
  WRONG_CONTROLLER_ID = the license file does not fit to the controller hardware
  SIG_INVALID = a signature within the license file is not valid
  CANNOT_READ = cannot read xml content of license file correctly
  CANNOT_OPEN = license file not available or corrupt
In any case the license is invalid or damaged, the DDC engine of the controller does not run. The tools connection to the controller already works to notify about the situation. In addition, the red alarm LED of controller will be ON in case of a failure.

- **Licensed Features**
  - 1 = feature enabled
  - * = no limit due to licensing

4. To view event enrollments information of the controller, click the *Event Enrollments* tab. Note that the event enrollment must be enabled in CARE on the System Status tab of the controller.

5. To view event enrollments information of the controller, click the *Event Enrollments* tab.
   For details, please refer the “Enable Event Enrollment Alarming for Controller System Status” section and the “Enable Event Enrollment Alarming for Controller Email Alarming” section.

---

**Device Name**

For 3rd party BACnet devices, a freely editable device name can be defined. If the BACnet device is an Eagle controller, the device name is the same as the controller name.

**IMPORTANT**

Do not use blanks or special characters.

---

**Display Plant Information**

Please refer also to the "Plants" section, p. 99.

**Procedure**

1. In the tree on the left, expand the *Advanced* item, then the *Plants* item and click on the single plant.

   **RESULT:** On the *Plant* tab on the right, general plant data are displayed.
Plant Information
Shows general plant properties such as:

- Plant Name
- Plant Type
- Plant Description

Cycle Information
Shows application specific properties related to the plant such as:

- Current Program State (running or stopped)
- Last Start Date
- Last Stop Date

The application program controlling the plant can be stopped individually by clicking the SHUTDOWN button and restarted by clicking the RESTART button.

IMPORTANT
Stopping and restarting the program does not stop and restart the entire controller application, but parts of the application which control that particular plant.

Error / Halt Information
Shows errors and halt information such as:

- Reason for Halt
- Error Details

NOTE: You can only shutdown or restart the control program if your access level is equal to or higher than the access level defined for these actions in the User Administration.
Fast Access Lists

Fast access lists are user specific lists which show suited information to dedicated people (e.g. electrician, project engineer, tenant).

Information can be either a list of certain datapoints, e.g. all outputs by using a filter template, or a list showing the impact of selected parameter values on datapoints.

Fast access lists can be created on controller level and on plant level. In plant related fast access lists, you can only view datapoints/parameters of this particular plant whereas controller related fast access lists can comprise datapoints/parameter of different plants of the controller.

Create Fast Access List

NOTE: The user can only create and delete a fast access list if his/her access level is equal to or higher than the access level defined for these actions. Otherwise the CREATE and DELETE buttons are not displayed.

A fast access list is only displayed for the user if the user’s read access level is equal to or higher than the read access level of the fast access list.

Procedure

1. In the tree on the left, expand the tree and navigate to the item (either controller or plant) you want to create the fast access list for.

2. Click on Fast Access Lists.

If available all existing user-defined fast access lists are displayed on the Fast Access Lists tab. A fast access list can be created either as datapoint/parameter overview or as filter template.

3. In the Name column, the fast access lists are listed by name.
4. In the Type column, the type (datapoint/parameter overview or filter template) is shown.

5. To create a new fast access list, click the NEW button.

RESULT: The New / Edit Fast Access List dialog box displays.

6. On the General tab, enter a name in the Name field.

7. From the Type drop-down list box, select the fast access list type under:
   - **Selected Points/Parameters**
     Allows watching the impact of changed parameter values on datapoints. The parameter values are changed online.
   - **Filter Template**
     Allows quickly displaying certain datapoints of a plant.

   NOTE: If this option is selected, the Assign Parameters tab will not be available.

8. From the Read Access Level and Write Access Level drop-down list boxes, select the user levels that should have read and write access of the fast access list.

9. If you have selected the fast access list type 'Selected Points/Parameters', continue with step 10. If you have selected the fast access list type 'Filter Template', continue with step 34.
10. Click on the **Assign Datapoints** tab.

![Assign Datapoints Tab](image)

11. Under **Datapoint Filter**, select the point types that should be used in the fast access list, as follows:

   a. Under **Plant**, select plant(s) of which datapoints you want to be displayed by clicking the BROWSE button and selecting the plants in the **Select Plants** dialog box.

      RESULT: Only the datapoints belonging to these plant(s) will be shown.

   b. Under **Type**, check/uncheck specific datapoint types to be included/excluded from the filter.

   c. Under **Name**, specific datapoint names can be filtered by entering a search text. By default all datapoints will be displayed as indicated by an asterisk. To display specific datapoint (names), enter the appropriate search text.

12. Click the **GO** Button to apply the filter.

   RESULT: In the **Assignable Points** list, all datapoints matching the filter criteria will be displayed.

   In the **Assigned Points** list, already-assigned datapoints are displayed.

13. To move points between lists, that is, to make them assigned or assignable, do one of the following:

   a. In the **Assigned Points** list or in the **Assignable Points** list, highlight the points to be moved. Multiselection by using the CTRL or the SHIFT key is possible.

   b. Click the **SINGLE ARROW** button with desired direction.

      Or,

   c. To move all points in one step,
d. Click the DOUBLE ARROW button with desired direction.

NOTE: Only those datapoints are displayed of which read access level is equal to or lower than the read access level of the user.

14. To change the row sort order in the fast access list, use the MOVE UP and MOVE DOWN buttons. Multiselection by using the CTRL or the SHIFT key is possible.

15. Click on the Assign Parameters tab.

Here can you configure the parameter filter for assigning parameters to the fast access list. Filtering is possible for control loops on plant level. Filter criteria are parameter path and parameter name. All parameters matching the filter criteria will be displayed in the Assignable Parameters list.

16. From the Plant drop-down list box, select the plant.

17. Under Control Loops, select control loop(s) by clicking the BROWSE button.

18. In the Parameter Path field, parameters can be filtered by their path. In the Parameter Name field, parameters can be filtered by their names.

19. Enter search criteria in the Parameter Path field and/or the Parameter Name field.

The search is case-sensitive and wildcards (*) and jokers (?) can be used. The asterisk * can only be used at the beginning or the end of the search entry. By default, the filter shows *, displaying parameters of all icons below the current
level. If any text is entered without wildcards, software searches for the exact match.

20. Click the GO Button to start search according to the filter criteria. All parameters matching the filter criteria will be displayed in the datapoints list in the lower Assignable Parameters area.

RESULT: In the Assigned Parameters list, already-assigned parameters are displayed.

In each list, the parameter path, name, and symbol are shown.

The path of the Assignable Parameters is displayed in the Path field. The Assignable Parameters list shows the parameter path, the name and the symbol of each parameter.

21. To navigate upwards in the path, click on Up on Level icon . To navigate downwards, click the on the parameter path entry in the list. Note the path display in the Path field.

22. To sort the Assignable Parameters list differently, click the BROWSE button at the Sort by field.

23. To change the row sort order for the fast access list, use the MOVE UP and MOVE DOWN buttons in the Assigned Parameters list.

24. To move parameters between lists, that is, to make them assigned or assignable, do one of the following:

a. In the Assigned Parameters list or in the Assignable Parameters list, highlight the parameters to be moved. Multiselection by using the CTRL or the SHIFT key is possible.

b. Click the SINGLE ARROW button with desired direction.

Or,

c. To move all parameters in one step, Click the DOUBLE ARROW button with desired direction.
25. Click the Configure Columns tab.

Here you can configure the columns display for the datapoints and parameters in the fast access list by selecting the column titles and the column order. The Available Columns list shows the max. number of available columns. The Visible Columns list shows the columns that will be displayed in the fast access list.

Column display will be configured by moving the columns between the Available Columns list and Visible Columns list.

26. To move column(s) between lists, that is, to make them visible or not, do one of the following:

a. To move single column(s).
   In the Available Columns list or in the Visible Columns list, highlight the columns to be moved. Multiselection by using the CTRL or the SHIFT key is possible.

b. Click the SINGLE ARROW button with desired direction.

Or,
c. To move all column(s) in one step, Click the DOUBLE ARROW button with desired direction.

NOTE: Columns marked with asterisk * cannot be removed from the Visible Columns list.

d. To set the display order in the Visible Columns list, highlight the column and use the MOVE UP and MOVE DOWN buttons.

27. Click the SUBMIT button to save settings done on the General, Assign Datapoints, Assign Parameters and Configure Columns tabs and click the CLOSE button.

RESULT: The list is inserted under Summary on the Fast Access List tab.

28. To change a parameter, click on the fast access list in the Name column under Summary.

RESULT: The fast access list displays.

29. Click on the parameter in the Name column under Selected Parameters List.
RESULT: The Parameter Value dialog box displays.

30. Click the DETAILS << button if you want to display additional information such as plant name, control loop name, parameter path and symbol type.

31. In the New Value field, enter the changed parameter value and click the SUBMIT button.

RESULT: Under Selected Parameters List, the value is updated in the Value/Unit column.

32. Watch the impact on values under Selected Points List above.

33. To finish, click the BACK button.

RESULT: The Fast Access Lists tab is redisplayed.
34. ...continued from step 7 when having selected fast access list type ‘Filter Template’. Click on the *Assign Datapoints* tab.

35. Under **Template Configuration**, configure the filter template by selecting the plant and point types that should be displayed (filter criteria) in the fast access list as follows:

   Under **Plant**, select plant(s) of which datapoints you want to be displayed by clicking the BROWSE button. Only the datapoints belonging to these plant(s) will be shown.

   Under **Type**, check/uncheck specific datapoint types to be included/excluded from the filter.

   Under **Name**, specific datapoint names can be filtered by entering a search text. By default all datapoints will be displayed as indicated by an asterisk. To display specific datapoint (names), enter the appropriate search text.

   Under **Sort Order**, define the sort order for the list by selecting the column titles and the sorting mode. For the basic naming of the column titles, see the **Configure Column** tab description in the following steps.

36. Click the GO Button to apply the filter. All datapoints matching the filter criteria will be displayed under **Matching Points**.

   **NOTE:** Only those datapoints are displayed of which read access level is equal to or lower than the read access level of the user.
37. Click on the Configure Columns tab.

Here you can configure the columns display for the datapoints list of the fast access list by selecting the column titles and the column order.

The Available Columns list shows the max. number of available columns. The Visible Columns list shows the columns of which the datapoints list consists. Column display will be configured by moving the columns between the Available Columns list and Visible Columns list.

38. To move column(s) between lists, that is, to make them visible or not, do one of the following:

a. To move single column(s),
b. In the Available Columns list or in the Visible Columns list, highlight the columns to be moved. Multiselection by using the CTRL or the SHIFT key is possible.
c. Click the SINGLE ARROW button with desired direction. Or,
d. To move all column(s) in one step, Click the DOUBLE ARROW button with desired direction.

NOTE: Columns marked with an asterisk * cannot be removed from the Visible Columns list.
e. To set the display order in the Visible Columns list, highlight the column and use the MOVE UP and MOVE DOWN buttons.

39. Click the SUBMIT button to save settings done on the General, Assign Datapoints and Configure Columns tabs.

40. Click the BACK button.

RESULT: The fast access list is displayed on the Fast Access Lists tab. To modify a fast access list, please refer to the "View/Modify Fast Access List" section.

### Fast Access Lists

<table>
<thead>
<tr>
<th>Summary</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Datapoint Filter</td>
</tr>
<tr>
<td>Fast Access List</td>
<td>Selected Points/Parameters</td>
</tr>
</tbody>
</table>

**View / Modify Fast Access List**

**Procedure**

1. To display a fast access list, click on the name under Summary.

RESULT: The datapoint list will be displayed. In this case, all value points are displayed.
2. Click the MODIFY button.

RESULT: The New / Edit Fast Access List dialog box displays.

3. Assuming that you want to display only the analog value points, edit the name to analog value points in the Name field.

4. Click the Assign Datapoints tab.
5. Remove all points from the Assigned Points list.

6. Under **Datapoint Filter**, uncheck All Types, check Analog Value, and then click the GO button.

RESULT: Under **Assignable Points**, all analog value points are listed.

7. Select points you want to be assigned by doing the following:
   
a. In the **Assigned Points** list, highlight the points to be moved. Multiselection by using the CTRL or the SHIFT key is possible.

   Or,

b. Click the SINGLE ARROW button with right direction.

c. To move all points in one step,

d. Click the DOUBLE ARROW button with right direction.

8. Click the SUBMIT button to save settings, and then click CLOSE button.

9. Click the BACK button.

10. Under **Summary**, click on the new name, in this case ’Analog Value Points’. The datapoint list is shown.
Delete Fast Access List

Procedure

1. To delete a single fast access list, click the checkbox at the name and click the DELETE button. To delete all fast access lists, click the top check box and click the DELETE button.

2. To delete all fast access lists, click the top check box and click the DELETE button.
Schedules

Please refer also to the “Time Programs” section, p. 97.

Schedules are daily and weekly time programs, which switch datapoints by setpoints or statuses. Schedules are assigned to plants and each schedule can command datapoints of that plant.

Each schedule specifies a list of datapoint properties to command (switchpoints) on a weekly basis. The week program defines the normal daily activity of the system by specifying which switchpoints are to be commanded each day of the week. The week program applies to a definable time period. There is only one week program per schedule.

Besides the week program, specific programs called exceptions can be created. Exceptions have higher priority than the week program and will overwrite the week program for a definable time period.

View Existing Schedules

**Procedure**

1. In the tree, expand the Advanced item, then the Plants item and navigate to the plant of which schedules you want to display.

2. On plant level, click on Schedules.

RESULT: On the Schedules tab on the right, all existing schedules of the plant are displayed.

The column order of the existing schedules can be displayed differently by applying a filter. When selecting **By Schedule Name**, the Schedule Name column will be the first column, followed by the Switched Properties column. When selecting **By Switched Properties**, the Switched Properties column will be the first column, followed by the Schedule Name column.

By entering a string in the Search String field specific schedules can be displayed. Usage of wildcards (* and ?) is possible.

By default, all schedules will be displayed indicated by the asterisk. A blank filter displays all schedules too. If any text without wildcards is entered, the filter will search for an exact match. The search is case-sensitive.
3. To display specific schedules, enter the appropriate search text.

4. Click the GO Button to apply the filter.

   All schedules matching the filter criteria will be displayed under **Existing Schedules**. For each schedule its name, switched properties and the description is displayed.

   Schedules can be newly created, edited, copied and deleted.

5. To create a new schedule, click the NEW button.

6. To edit a schedule, click on the schedule name listed in the Schedule Name column.

7. To copy a schedule, click the checkbox at the schedule name and click the COPY button.

   **RESULT:** The name of a copied schedule will be replaced with "Copy of <source schedule name>".

   After the successful copying we recommend to edit the schedule entries.

8. To delete a schedule, click the checkbox at the schedule name and click the DELETE button. To delete all schedules, click the top checkbox in the title line and click the DELETE button.

   **NOTE:** Schedules are only displayed, if the read access level of the user is equal to or higher than the read access level of the schedule.

   Creating, editing, deleting and copying schedules are only possible if:
   - the user’s access level is higher than the access level for creating, editing, deleting and copying schedules defined in the user administration. Otherwise the NEW, DELETE and COPY buttons are not displayed.
   - the user’s write access level is equal to or higher than the write access level of the individual schedule.

---

**Create Schedule**

**Procedure**

1. On the Schedules tab, click the NEW button.

   **RESULT:** The New / Edit Schedule dialog box displays.
Here you select the datapoints to be switched. In addition, datapoint details can be edited.

Datapoints can be switched in the following two ways:

Standard
Just a single datapoint with its present value property can be switched. By default, a datapoint has the present value property assigned.

Enhanced
Multiple datapoints with their present value property can be switched (accessible via ENHANCED button).

2. Under **Plant**, select plant(s) of which datapoints you want to be filtered by clicking the BROWSE button.

3. Under **Point Type**, select the point type to be filtered.
   
   **NOTE:** Inputs cannot be switched.

   Under **Point Name**, specific datapoint names can be filtered by entering a search text. Wildcards can be used for filtering. By default all datapoints will be displayed as indicated by an asterisk. The filter function is case-sensitive.

4. To display specific datapoint names, enter the desired search text.

5. Click the GO Button to apply the filter.
   
   **RESULT:** All datapoints matching the filter criteria will be displayed in the list below.

6. Click the datapoint you want to be switched.
   
   **RESULT:** The datapoint will be inserted in the **Properties** field under **Switched Properties**.

7. To edit a datapoint’s details that is selected in the list, click the DETAILS button.
8. To apply enhanced mode for switching multiple datapoints, click the ENHANCED button.

RESULT: The Enhanced property selection dialog box displays.

9. Under Datapoint Filter, define the filter to display desired datapoints to be switched by doing one of the following:
   
   a. Under Plant, select plant(s) of which datapoints you want to be filtered by clicking the BROWSE button.
   
   b. Under Point Type, select the point type to be filtered.
   
   NOTE: Inputs cannot be switched.
   
   c. Under # of States, enter the number for multi-state points (MO, MV).
   
   d. Under Point Name, specific datapoint names can be filtered by entering a search text. Wildcards can be used for filtering. By default all datapoints will be displayed as indicated by an asterisk. The filter function is case-sensitive. To display specific datapoint names, enter the desired search text.

10. Click the GO Button to apply the filter.

RESULT: All datapoints matching the filter criteria will be displayed in the Assignable Datapoints list under Select Property to Switch.

11. Under Assignable Datapoints, select the datapoints to be switched.
Datapoints are selected/deselected from switching status by moving them between the Assignable Datapoints and the Switched Properties list.

12. To move datapoints between lists, that is, to make them switched or not, do one of the following:

   a. To move single datapoint(s),
      Highlight the datapoint(s) to be moved in the Assignable Datapoints list. Multiselection by using the CTRL or the SHIFT key is possible.
   b. Or, click the checkbox at the point name in the Switched Properties list.
   c. Click the SINGLE ARROW button with desired direction. 
      Or,
   d. To move all datapoints in one step,
      Click the DOUBLE ARROW button with desired direction.

13. Under Switched Properties, select the property from the Property drop-down list box for each datapoint.

   NOTE: Software performs consistency checking for datapoint type, property and engineering unit. This ensures that the engineering unit corresponds to the property to be switched and prevents the same schedule from switching
   - datapoints of different types (AO and BO), or
   - different properties (e.g. present value and low alarm limit) of the same datapoint, or

   If any of these items do not match, the corresponding lines are marked with an inconsistency warning.

14. To save settings, click the OK button.

   RESULT: The New / Edit Schedule dialog box displays.

   The datapoints to be switched are listed in the Properties field under Switched Properties.

15. Click the SUBMIT button.

16. Continue by clicking the Details tab.
Here you can enter the following details of the schedule:

- **Name**
- **Description**
- **Valid period**
- **Priority for writing**
- **Access rights**

17. In the **Schedule Name** field, enter the name for the schedule.

18. In the **Description** field, enter an additional description if desired.

19. The valid period for the schedule will be defined by selecting the start and end date under **Valid From** and **Valid Until**. By default, the schedule is valid one year from the current date on.

20. To define the valid period of the schedule, do the following:

   Click the **Valid From** checkbox and select the start date from the drop-down list box.

   **NOTE:** If the checkbox is unchecked, no start date can be selected. This means that the schedule is valid on any date up to and including the end date.

   Click the **Valid Until** checkbox and select the end date from the drop-down list box.

   **NOTE:** If the checkbox is unchecked, no end date can be selected. This means that the schedule is valid on any date from the start date on.

   **NOTE:** If both checkboxes are disabled, the schedule is always valid.
21. From the **Priority for Writing** drop-down list box, select the priority between 9 and 16 (lowest). The priority defines which priority the schedule will have in the BACnet priority array.

22. From the **Read Access level** drop-down list box, select the user level that should have read access for the schedule.

Schedules will only be displayed in the Eagle Web Interface if the read access level of the user is equal to or higher than the read access level of the schedule.

23. From the **Write Access level** drop-down list box, select the user level that should have write access for the schedule.

**NOTE:** Creating, editing, deleting and copying of schedules in the Eagle Web Interface is only possible if the user's write access level is equal to or higher than the write access level of the schedule.

24. Click the **SUBMIT** button.

25. Continue by clicking the **Values** tab.

Here you can do the following:

- Change details of switched properties (point)
- Define a schedule default value
- Override the present value (Manual)
26. To change details of a switched property, click the switched property, then click the DETAILS button, and then change desired value/option on the Values tab in the Details dialog box of the datapoint.

27. To define a schedule default value, enter the value in the Schedule Default Value field, or check the NULL checkbox. The schedule default value is used at 12.00 AM as present value of all switched properties when no other value is in effect. The schedule default value can be any value or NULL. The NULL value removes the current value entry of the switched properties from the priority array. Then the next lower value in the priority array becomes the present value of the switched properties.

NOTE: You must enter a schedule default value.

28. To manually override the present value, check the Out of Service check box, and then enter the value in the Manual field, or check the NULL checkbox right to the Manual field.

29. Continue by clicking the Weekly Program tab.

On the Weekly Program tab, you create the weekly program that should be performed during the schedule period defined on the Details tab.
This is done by defining switchpoints. Switchpoints are time-value pairs per day that determine the time when the schedule sets a certain value.

In the Properties list under Switched Properties, the switched properties are displayed. The corresponding engineering unit / state text of the selected property is shown on the right under Eng. Unit / State Text.

To view/edit a datapoint’s details selected in the list, click the DETAILS button.

Switchpoints can be defined under Switchpoints. Switchpoints can be deleted and copied to other weekdays.

30. Under Switchpoints, define switchpoints as follows:
   a. On top, select the day from the drop-down list box.
   b. Click the NEW button.
      A new row will be inserted.
   c. Enter the time and value in the corresponding fields.
   d. Check the NULL checkbox if you want to remove the current value at the switching time from the priority array.

   ![Switchpoints](image)

   **NOTE:** The switchpoint list must not cover each weekday.
   If a weekday has duplicate entries, the row is marked.

31. To delete a switchpoint, click the checkbox at the time-value pair row and click the DELETE button.
32. To copy a switchpoint, click the checkbox at the time-value pair row and click the COPY button.

RESULT: The Copy Switchpoints dialog box displays.

Here you can copy a switchpoint from one single source weekday to one or multiple destination weekdays.

Under **Source Weekday**, the source weekday is displayed. Under **Destination Weekday(s)**, you select the Destination Weekday(s). Under **Mode**, you can define how duplication conflicts should be handled, for example, if the source switchpoint is on 7.00 and the target weekday already contains a switchpoint on 7.00.

33. Under **Destination Weekday(s)**, click the weekday in the list. Multiselection by using the CTRL or the SHIFT key is possible. To select/unselect all points in one step use the SELECT ALL or the UNSELECT ALL button.

34. Under **Mode**, select the mode by clicking the desired radio button at:

- **Overwrite complete day(s)**
- **Overwrite duplicates**
- **Do Not Overwrite duplicates**

All existing switchpoints in the destination weekday(s) are deleted.
Overwrite duplicates
Destination switchpoints with the same time as the source switchpoint are overwritten by the source switchpoint.

Do not overwrite duplicates
Destination switchpoints with the same time as the source switchpoint are not overwritten by the source switchpoint.

35. To save settings, click the OK button.

RESULT: The New / Edit Schedule dialog box redisplays.

36. Click the SUBMIT button.

37. Continue by clicking the Exceptions tab.

38. To create a new exception, click the NEW button.

RESULT: The New Exception dialog box displays.
39. From the Priority drop-down listbox, select the priority of the exception. The priority defines the processing sequence in case exceptions have overlapping validity ranges. Priorities are from 1 to 16 (lowest).

40. Define the switchpoints in the same way as described for the week program (starting with step 29). Instead of defining switchpoints per day, you can define a valid period for the exception (see following step).

41. Click on the Valid Period tab.
Here you define the valid period for the exception. In the Properties list, the switched properties are displayed.

42. Select option by clicking radio button at:
   - Specific Date
     e.g. for May 1th on 01.05.2008
   - Date Range
     e.g. for Summer holidays from 07.21.2008 until 08.09.2008
   - Recurring Event
     e.g. for every last Friday of every Month
   - Calendar Reference
     A project-wide calendar provides dates, e.g. regional holidays and public/religious festivals or any other particular date. The time period can be a specific date, a date range or a recurring event.

43. Under Name, enter the name of the valid period.

44. In the corresponding fields below, enter the data of the valid period:
   - Specific Date
     Under Specific Date on, enter the date or select date by using the BROWSE button. You may use wildcards in any of the fields.
     Example: 12/24/* represents Christmas Eve of each year.
   - Date Range
     Click the checkbox at Date Range from, respectively Date Range to, and enter the date or select date by using the BROWSE button.
Recurring Event
Under **Recurring on**, select options from the drop-down list boxes.

**Example:** Validity Type = Date Range

45. Click the OK button to save settings.

**RESULT:** The *New Schedule* dialog box redisplay showing the exception on the *Exceptions* tab.

46. To edit an exception, click on the exception in the list.

47. To copy an exception, click the checkbox at the exception and click the COPY button (see Copy Switchpoint description in the Week Program creation).

48. To delete an exception, click the checkbox at the exception and click the DELETE button (see Delete Switchpoint description in the Week Program creation).

49. To finish creating a new schedule, click the SUBMIT button.

**RESULT:** The new schedule is added to the *Existing Schedules* list on the *Schedules* tab.
Calendars

Please refer also to the “Time Programs” section, p. 97.

Calendars are assigned to a whole project. They contain exception days or periods, e.g. Christmas, holidays. If controller schedules refer to the same calendar(s), project wide scheduling is possible for these controllers; this is because calendar dates are executed in each controller of the project, which has references to the calendar. Changes in multiple particular controller schedules can be quickly made by simply changing the referenced calendar(s).

View Calendars

Procedure

1. In the tree, expand the Advanced item and click on Calendars.

RESULT: On the right, the Calendars tab displays showing all existing calendars.

All changes done to a calendar on this controller level will be synchronized with all other controllers of the same project.

For each calendar the following properties are shown:

Calendar Name
Description
Active

Shows whether the current date is within the date range of any of the calendars’ entries or not, that is, whether the calendar impacts the current date or not.

Calendars can be edited, copied, deleted and newly created. For each calendar, the referenced schedules can be viewed.
2. To edit a calendar, click on the calendar name listed in the **Calendar Name** column.

3. To create a new calendar, click the NEW button.

4. To copy a calendar, click the checkbox at the calendar name and click the COPY button. The name of a copied calendar will be replaced with "Copy of <source calendar name>". After successful copying we recommend editing the calendar entries.

5. To delete a calendar, click the checkbox at the calendar name and click the DELETE button.

Or, to delete all calendars, click the top checkbox in the title line and click the DELETE button.

6. To show referenced schedules of a calendar, click the checkbox at the calendar name and click the SHOW REFERENCES button.

**NOTE:** Calendars are only displayed if the read access level of the user is equal to or higher than the read access level of the calendar.

Creating, editing, deleting and copying calendars are only possible if:

- the user's access level is higher than the access level for creating, editing, deleting and copying calendars defined in the user administration. Otherwise the NEW, DELETE and COPY buttons are not displayed.
- the user's write access level is equal to or higher than the write access level of the individual calendar.

---

**Create Calendar**

**Procedure**

1. In the tree, expand the **Advanced** item and click on Calendars.

RESULT: On the right, the **Calendars** tab shows all existing calendars.

2. Click the NEW button.

RESULT: The **New Calendar** dialog box displays.
3. In the Name field, enter a name for the calendar.

4. In the Description field, enter a description for the calendar if desired.

5. From the Read Access Level and Write Access Level drop-down list boxes, select the user levels that should have read and write access of the calendar.

   NOTE: A calendar entry will only be displayed if the read access level of the user is higher than the read access level of the calendar.
   A calendar entry can only be edited or deleted if the write access level of the user is higher than the write access level of the calendar.

6. Click the NEW ENTRY button.

   RESULT: The New / Edit Calendar Entry dialog box displays.

7. Under Validity Type, you can define the valid period for the new calendar entry.

8. Select option by clicking radio button at:
   - Specific Date
     e.g. for Christmas Eve on 24.12.2004
   - Date Range
     e.g. for Summer holidays from 27.07.2004 until 09.09.2004
   - Recurring Event
     e.g. for every last Friday of every Month

9. Under Name, enter the name of the valid period.

10. In the corresponding fields below, enter the data of the valid period:
    - Specific Date
      Under Specific Date on, enter the date or select date by using the BROWSE button. You may use wildcards in any of the fields.
      Example: 12/24/* represents Christmas Eve of each year.
    - Date Range
      Click the checkbox at Date Range from, respectively Date Range to, and enter the date or select date by using the BROWSE button.
    - Recurring Event
      Under Recurring on, select options from the drop-down list boxes.
Example:  Valid period = Recurring Event

11. Click the OK button.

RESULT: The New Calendar dialog box redisplays and the new entry is inserted under List of Dates.

12. Click the SUBMIT button, and then click the CLOSE button.

RESULT: The Calendar is displayed on the Calendars tab.
Copy Calendar

Procedure

1. On the Calendars tab, select the calendar you want to copy by checking the check bar at the calendar name.

2. Click the COPY button.

   RESULT: A copy of the selected calendar is added to the existing calendars.

3. Confirm the message box and change the calendar entries in the dialog box displayed. For information on how to change calendar entries, please refer to the "Edit Calendar" section.
**Procedure**

1. In the *Calendar Name* column on the *Calendars* tab, click on the calendar you want to edit.

   ![Calendar List](image)

   **RESULT:** The *New / Edit Calendar* dialog box displays.

   ![New / Edit Calendar Dialog](image)

   Here, general information such as name, description and active state is displayed. The name and description can be changed. In addition, access rights can be defined for the calendar and the list of dates can be edited by deleting entries and creating new entries. The *Status* field shows whether the current date is within the date range of any of the calendars’ entries, that is whether the calendar impacts the current date or not.

2. To edit the calendar name, click in the *Name* field and enter a new name.

3. To edit the calendar description, click in the *Description* field and enter a new description.
4. To change read or write access levels, select different levels from the **Read Access Level** respectively **Write Access Level** drop-down list boxes.

5. Under **List of Dates**, you can edit, delete and create new calendar entries.

   **NOTE:** A calendar entry will only be displayed if the read access level of the user is higher than the read access level of the calendar. A calendar entry can only be edited or deleted, if the write access level of the user is higher than the write access level of the calendar.

6. To edit a calendar entry, click on the entry in the **Date** column and change the entry data in the **New / Edit Calendar Entry** dialog box. For detailed information on fields and functions in this dialog box, please refer to the "Create New Calendar" section.

7. To delete a calendar entry, click the checkbox at the entry name and click the **DELETE** button.

   Or, to delete all calendar entries, click the top checkbox in the table heading and click the **DELETE** button.
8. To create a new calendar entry, click the NEW ENTRY button. For detailed information, please refer to the "Create New Calendar" section.

9. After finishing with the changes, click the SUBMIT button.

RESULT: The New / Edit Calendar dialog box redisplay.

10. Click the SUBMIT button, and then click the CLOSE button.

RESULT: The copied calendar is added to the Calendar List.
Delete Calendar

Procedure

1. To delete a calendar, click the checkbox at the calendar name and click the DELETE button.

Or,

2. To delete all calendars, click the top checkbox in the title line and click the DELETE button.

Show Calendar References

Procedure

1. On the Calendars tab, select the calendar the references of which you want to show by checking the check bar at the calendar name.

RESULT: The Calendar References dialog box displays showing all schedules which reference via exceptions to the selected calendar. The controller, to which the schedule is assigned, is also shown. You can view detailed information of the exception and edit the exception by clicking on the schedule in the Schedule Name column. For detailed information on how to edit a referencing exception of a schedule, please refer to the Exception tab description (3) of the "Create New Schedule" section.
Datapoints

Please refer also to the "Time Programs" section, p. 23.

View Datapoint List

Datapoint lists can be displayed for all plants or for a particular plant.

Procedure

1. In the tree, expand the Advanced item and navigate to the Datapoints item, either on level of all plants or on level of a particular single plant.

2. In the tree, click on Datapoints.

   RESULT: On the right, the datapoints are listed on the Datapoints tab. You can display specific datapoints and their properties by applying a filter. For each datapoint its details can be viewed and edited.

3. Under Datapoint Filter, select the point types that should be displayed, as follows

   e. Check Points in Alarm or Points in Manual.

   f. Under Type, check/uncheck specific datapoint types to be included/excluded from the filter.

   g. Under Name, specific datapoint names can be filtered by entering a search text. By default all datapoints will be displayed as indicated by an asterisk. To display specific datapoint (names), enter the appropriate search text.

   h. Click the GO Button to apply the filter.
RESULT: In the **Datapoint List**, all datapoints matching the filter criteria will be displayed.

NOTE: Only those datapoints can be displayed of which read access level is equal to or lower than the read access level of the user.

Datapoints can have the following properties:

- **Name**
  A datapoint’s details can be edited by clicking on its name

- **Value/Unit**
  Shows the current value with engineering unit (analog datapoint) or state (digital datapoint)

- **Event State**
  Shows the transition type
  - **Normal**
    The alarm is going to normal state, that is, the value of the datapoint remains under the high limit, or exceeds the low limit.
  - **Off-Normal**
    The alarm reaches off-normal state that the datapoint value exceeds the high limit, or remains under the low limit.
  - **Fault**
    The alarm originates in a fault such as sensor break, etc.
  - **High Limit**
    Point value has exceeded the high limit. Special case of the Off-Normal state of analog inputs, analog outputs, and analog values.
  - **Low Limit**
    Point value has dropped below the low limit. Special case of the Off-Normal state of analog inputs, analog outputs, and analog values.

- **Type**
  e.g. AI, AO, etc.

  - **ALM** = point is in alarm
  - **FLT** = point has a fault
  - **OVR** = point value is overridden
  - **OOS** = point is out of service

4. To view or edit details of a datapoint, click on the datapoint name.

NOTE: Only those datapoints are displayed and can be edited of which read access level is equal to or lower than the read access level of the user.

5. To sort the list, click the BROWSE button at the **Sort by** field.

### View / Edit Datapoint Details

Viewing/editing datapoint details may include the following:

- View general properties such description, point role, LON mapping data, and access rights
- Manually override the present value, that switch between Manual and Auto mode
- Enable/disable alarm reporting
- View alarm status (flags)
- Change COV value
- Change Relinquish Default value
- Enable/disable Off-Normal conditions
- View/edit event enrollment alarming
Continue with the "General Procedure" which describes where the functions will be accessible.

**General Procedure**

1. On the Datapoints tab, click on the datapoint in the Name column (see also "View Datapoints List" section).

![Datapoints Table](image)

**RESULT:** The Details dialog box of the selected datapoint displays.

**Example:** Analog Input Details of AI.

By default, the Values tab is selected.

2. View / change desired datapoint details by selecting the desired tab, of which functions are described in the following:

- **General**
  - Shows general properties such as description, LON mapping data, and access rights
  - See "View General Properties" section as follows.

- **Alarming**
  - Enable/disable alarm reporting
  - Enable/disable Off-Normal conditions
  - See "View / Edit Alarming" section as follows.

- **Values**
  - Manually override the present value, that switch between Manual and Auto mode View alarm status (flags)
  - Change COV value
  - See "View / Edit Values" section in the following.
Command Priorities
- Change Relinquish Default value
  See “View / Edit Command Priorities” section as follows.

Event Enrollments
- View/Edit event enrollment alarming
  See “View / Edit Event Enrollment Alarmings” section as follows.

---

View General Properties

**Procedure**

1. In the *Details* dialog box of the selected datapoint, select the *General* tab.

Here the following datapoint details are shown:

**Properties**
- **Type**
  - Shows datapoint type, e.g. analog input, binary input etc.
- **#States**
  - Shows the number of states of a multi-state datapoint (applies to MI, MO, MV datapoints only).
- **Description**
  - Shows a detailed description

**FIO Mapping**
Here you can view Mapping details such as:

- **Mapping**
  - Shows the Mapping type, e.g. PV = Present Value
- **Name / NV Name**
  - Shows the name of the datapoint, or NV name of LON points
- **Type / NV Type**
  - Shows the datapoint type (e.g. float, unit32) or the NV type of LON points, e.g. SNVT_temp
- **Direction**
  - Shows the type of direction, input or output of the datapoint (onboard and panel bus I/Os only).
  - For LON Points the corresponding NV, e.g. NV in is displayed.

**Access Rights**
Shows the read and write access level of the datapoint.
To write values to a datapoint, you must have a write access level equal or higher than the write access level of the datapoint.

Datapoint details will only be displayed if you have a read access level equal to or higher than the read access level of the datapoint.

2. Click the SUBMIT button to save settings.

3. To view /edit alarming details, click on the Alarming tab (see "View / Edit Alarming" section).

---

**View / Edit Alarming**

**Procedure**

1. In the Details dialog box of the selected datapoint, select the **Alarming** tab.

---

**Analog Input Details**

- **Intrinsic Reporting**
  - **Notification Class:** LOW
  - **Notify Type:** Alarm

- **Transitions:**
  - **Event** | **Reporting** | **Ack.** | **Last Transition**
  - To-Off Normal | ✔ | ✔ | 05/20/2017 21:02:50
  - Back-To Normal | ✔ | ✔ | 05/20/2017 21:02:50
  - To Fault | ✔ | ✔

- **Off-Normal Conditions**
  - **High Limit Enable:**
  - **Low Limit Enable:**
  - **Dead Band:**
  - **Suppress Alarm:**
  - **Alarm Delay:**
  - **Back-To Normal:**

---

Here you can enable/disable alarm reporting and Off-Normal conditions, select a different notification class and view alarm information.

**Intrinsic Reporting**

Intrinsic Reporting means, that only the present value property is to be considered for alarming.

**Notification Class**

- Shows the name of the notification class. You can change the notification class by selecting another notification class from the drop-down listbox.

**Alarm Type**

- By default all alarms are of the type ‘event’.
Transitions
Here the following data about transitions are shown:

Event
Shows the transition types that can be selected for reporting:

− Back To-Normal
  The alarm is going to normal state, that is, the value of the datapoint remains under the high limit, or exceeds the low limit.

− To Off-Normal
  The alarm reaches off-normal state, that is, the datapoint value exceeds the high limit, or remains under the low limit.

− To Fault
  The alarm originates in a fault such as sensor break, etc. (depends on point type)

Reporting
Check the transition type you want to be reported, that is, which transition should be saved in the alarm buffer and in the alarm list.

Ackn.
Each transition will be acknowledged (checked) by default.

Last Transition
Shows the date when the last transition has occurred.

Off-Normal Conditions
Here you can define/change the conditions, which set off an Off-Normal event. The Off-Normal conditions depend on the point type.

High Limit Enable (applies to AI, AO, AV, and PC datapoints only)
If a high limit is exceeded and this condition remains present for at least the defined alarm delay (time), than an alarm of event type 'To-Off-Normal' is set off. To set a high limit, click checkbox and enter value into the field.

Low Limit Enable (applies to AI, AO, AV, PC datapoints only)
If the present value falls below the low limit and this condition remains present for at least the defined alarm delay (time), an alarm of event type 'To-Off-Normal' is set off. To set a low limit, click checkbox and enter value into the field.

To set a low limit, click checkbox and enter value into the field.

Deadband (applies to AI, AO, AV datapoints only)
In order to set off an alarm of event type 'To-Off-Normal', for at least the defined alarm delay (time) the present value must remain within the range: low limit plus deadband and high limit minus deadband.

Enter deadband value.

Suppress alarm (applies to all datapoint types)
Enables/disables alarming.

Alarm Delay (applies to all datapoint types, except PC datapoint)
Defines the time delay with which the 'To-Off-Normal' event will be set off.

Enter alarm delay value.
Alarm Value Enable (applies to BI and BV datapoint types only)
Here you can select the alarm value (status), e.g. 0 or 1, ON or OFF, Up or Down, when an alarm should be reported in case of binary input changes. In addition an alarm delay can be entered in the **Alarm Delay** field.

Check the **Alarm Value Enable** checkbox and select desired value from the drop-down list box.

Suppress alarm (applies to all datapoint types)
Enables/disables alarming.

Alarm Delay (applies to all datapoint types, except PC datapoint)
Defines the time delay with which the 'To-Off-Normal' event will be set off.

Enter alarm delay value.

State Text, Is Alarm Condition, Is Fault Condition
(applies to MI and MV datapoint type only)

For Multi-State Inputs and Multi-State Value datapoints you can define the states which represent and set off an 'Off-Normal' and/or a 'Fault' event.

Each state can be set for setting off a 'To-Off-Normal' and/or a 'Fault' event.

For each state, check the conditions by clicking the corresponding radio button.

Suppress alarm (applies to all datapoint types)
Enables/disables alarming.

Alarm Delay (applies to all datapoint types, except PC datapoint)
Defines the time delay with which the 'To-Off-Normal' event will be set off.

Enter alarm delay value.

2. Click the **SUBMIT** button to save settings.

3. To view/edit datapoint values, click on the **Values** tab (see "View / Edit Values" section.)
View / Edit Values

**Procedure**

1. In the Details dialog box of the selected datapoint, select the Values tab.

### Analog Input Details

**Present Value**

- **Auto:** 0.00 V
- **Manual:** 0.00 V
- Minimum Present Value: -50.00 V
- Maximum Present Value: 150.00 V
- Characteristic: XLv_Conv_Percent_0to10
- Resolution: 0.10
- Reliability: No Error detected
- Safety Value: Last valid value
- Sensor Offset: 0.00 V

**Status**

- In Alarm
- Overridden
- Fault
- Out of Service

### Change of Value

Increment: 0.50 V

Here you can manually override the present value, that is, switch between Manual and Auto mode and vice versa, view alarm status (flags) and change the COV value.

**Present Value**

Here you can set the datapoint's "operation mode" to auto or manual. In addition the hardware reliability (sensor breaks), the characteristic and further properties of the physical input is shown.

- **Auto** (applies to all datapoint types)
  - In Auto operation mode (Auto=checked), the datapoint shows the current value of the datapoint.

- **Manual** (applies to all datapoint types)
  - In Manual mode, the current datapoint value can be overwritten.
  - To override the current value, click the Manual Override radio button and enter the value into the field.

**NOTE:** When an AI datapoint is set into Manual mode and its value will be overwritten, the 'overridden' and 'out of service' flag will be set (see Status). The set out of service flag indicates that the datapoint is decoupled from the physical input (sensor) to prevent a sensor value

Refresh: 30 sec
from instantly overwriting the manual value in the next scan cycle.

NOTE: When an AO datapoint is set into Manual mode, its current value will be overwritten by the manual value that has a higher priority (8). As long as no other process of higher priority writes to the analog output, the manual value is present. The overridden flag will be set (see Status).

Minimum Present Value
Defines the minimum value of the graphical bar display in the EBI. Defaults to the Low Limit Reporting value

Maximum Present Value
Defines the maximum value of the graphical bar display in the EBI. Defaults to the Low Limit Reporting value

Characteristic
Shows the name of the characteristic

Resolution
Shows the resolution which defines the smallest recognizable change of the present value. The smaller the value the more precise a value change can be recognized.

Reliability
Shows whether the hardware assigned to the datapoint is in proper condition or not. Depending on the datapoint type, the following conditions may be displayed:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Error Detected</td>
<td>Loop is in proper condition, that is, present value is reliable; that is, no other fault has been detected.</td>
</tr>
<tr>
<td>No Sensor</td>
<td>Sensor may be not connected</td>
</tr>
<tr>
<td>No Output</td>
<td>Hardware may be not connected</td>
</tr>
<tr>
<td>Unreliable Other</td>
<td>The controller has detected that the present value is unreliable, but none of the other conditions describe the nature of the problem. A generic fault other than those listed above has been detected, e.g., a Binary Input is not cycling as expected.</td>
</tr>
</tbody>
</table>

NOTE: For binary output datapoints, the reliability will work only if the service type of the corresponding NVo in CARE is set to ‘acknowledged’.

Safety Value
Shows the safety value, to which the point will command the device in case of communication failure or application stop

Sensor Offset (applies to onboard I/Os)
You can enter or change the sensor offset value

Feedback Value (applies to BO and MO datapoints only)
Defines the datapoint that should provide the value for feedback control in case of BACnet fault and command failure alarms. The feedback point must be an input of the same type. The selected feedback point will not be available on the controller HMI and web interface.

NOTE: The feedback point must not be used in a control loop since as a result the control loop will not be executed properly.

Use as Setpoint (applies to AV, BV and MV datapoints only).
If in CARE this property is set for a datapoint, the Use as Setpoint field will be displayed in the HTML Interface and on the controller HMI for overwriting the present value without the necessity of setting the datapoint into manual mode before. Instead, the present value can be overwritten quickly by
entering the value in the **Use as Setpoint** field displayed in the corresponding interface.

**NOTE:** The field will not be available in the HTML Interface and on the controller HMI if the property is not selected in CARE.

### Resolution

Shows the resolution which defines the sensitivity for value transmission

### Reliability

Shows the reliability (see above)

### Direct/Reverse

Shows the polarity (applies to BI and BO datapoints only)

The polarity indicates the relationship between the physical state of the input and the logical state represented by the present value. If the polarity is NORMAL, then the ACTIVE state of the present value is also the ACTIVE or ON state of the physical input. If the polarity is REVERSE, then the ACTIVE state of the present value is the INACTIVE or OFF state of the physical input.

<table>
<thead>
<tr>
<th>Polarity</th>
<th>Present Value</th>
<th>Physical State of Input</th>
<th>Physical State of Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORMAL</td>
<td>INACTIVE</td>
<td>OFF or INACTIVE</td>
<td>not running</td>
</tr>
<tr>
<td>NORMAL</td>
<td>ACTIVE</td>
<td>ON or ACTIVE</td>
<td>running</td>
</tr>
<tr>
<td>REVERSE</td>
<td>INACTIVE</td>
<td>ON or ACTIVE</td>
<td>not running</td>
</tr>
<tr>
<td>REVERSE</td>
<td>ACTIVE</td>
<td>OFF or INACTIVE</td>
<td>running</td>
</tr>
</tbody>
</table>

Select polarity by clicking corresponding radio button.

### Safety Position

You can select the position, to which the point will command the device in case of communication failure or application stop (no response):
Analog Output:
- 0 %
- 50 %
- 100%
  device is commanded to the selected percentage value
- Remain in current position
  device is commanded to the last valid position

Binary Output:
- logical state depending on state text definition, e.g.: OFF, ON, ALARM, NORMAL, etc.
  device is commanded to the selected logical state
- Remain in current position
  device is commanded to the last valid position

Change of State Time
Displays the time when the state has changed the last time

EOH/EOV Optimization (applies to AV, BV, and MV datapoints)
Check whether the datapoint should be optimized (Yes) or not (No), in case the datapoint is used as setpoint for energy optimized heating or ventilation.

In the following fields you can reset the pulse converter (applies to PC datapoint only).

Present Value
Shows the present value of the pulse converter

Reset To
Enter the desired value and then click OK

Time of last Reset
Shows the time of the last pulse converter reset

Change of State Counter (applies to BI and BO datapoints only)
Change of State Count
Displays the number of state changes

Reset To
Here you can reset the state counter

Time of State Count Reset
Shows the time of the last state counter reset

**Runtime Counter** (applies to BI and BO datapoints only)
Here you can view the current runtime and reset the runtime counter to a specific time (e.g. in case of maintenance, change of pump).

**Runtime Counter**

<table>
<thead>
<tr>
<th>Runtime (Active Time):</th>
<th>0 : 03 : 10 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reset to:</td>
<td>0 : 00 : 00 hours</td>
</tr>
<tr>
<td>Time of last Reset:</td>
<td></td>
</tr>
</tbody>
</table>

Runtime (Active Time)
Displays the active runtime of the device

Reset To
Here you can reset the runtime counter. Enter the desired value and then click OK

Time of last Reset
Shows the time of the last runtime counter reset

**Status** (All datapoint types)
Here the status flag condition and the event state are displayed.

**Status**

- [ ] In Alarm
- [ ] Overridden
- [ ] Fault
- [ ] Out of Service

If checked, the status flags have the following meaning:

- **In Alarm**
  Datapoint is in alarm. Cause can be faults, Off-normal conditions, and life-safety alarm.

- **Fault**
  The datapoint or the physical input is not reliable, e.g. in case of sensor break (Open Loop).

- **Overridden**
  Datapoint is in manual operation mode. Value has been overwritten.

- **Out of Service**
  Physical input is decoupled from the datapoint, e.g. in case of manual override. The present value displayed is not the present value, which would be delivered by the physical input.

**NOTE:** Multiple flag indications are possible.

**Example:** A ‘To-Fault transition’ causes also always an alarm. Hence both, the ‘In Alarm’ and the ‘Fault’ status flags are enabled.

**Event State** (All datapoint types)
Shows the event state of the datapoint:
Normal Operation
Point is in normal operating state.

Off-Normal Condition
Point value is out of normal range.

Fault
Point is prevented from proper operation. Point value can be in normal or out of normal range. Due to the maloperation of the point, the value is unreliable.
Causes for a fault can be, for example sensor and cable breaks.

Above High Limit
Point value has exceeded the high limit. Special case of the Off-Normal state of analog inputs and outputs.

Below Low Limit
Point value has dropped below the low limit. Special case of the Off-Normal state of analog inputs and outputs.

Change of Value (applies to AI, AO, AV and PC datapoints only)

<table>
<thead>
<tr>
<th>Change of Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increment:</td>
</tr>
<tr>
<td>Period:</td>
</tr>
</tbody>
</table>

Increment
Here you can enter/change the change of value increment (COV).
The COV Increment specifies the minimum change in present value that causes the controller sending the present value to the Eagle Web Interface.
Enter value into the field.

Period (applies to PC datapoint only)
Defines the amount of time in seconds between the periodic transmissions of the present value. This property can be used alone or in combination with the Increment property. When the period property is used in combination with the increment property, the present value will always be updated periodically independent on the transmissions of the present value due to the COV setting.

2. Click the SUBMIT button to save settings.

3. To view/edit datapoint command priorities, click on the Command Priorities tab (see “View / Edit Values” section).

View / Edit Command Priorities

(Appplies to AO, AV, BO, BV, MO, and MV datapoint types only)

1. In the Details dialog box of the selected datapoint, select the Command Priorities tab.
Here you can view the command priority levels and enter/change the relinquish default value.

The priority list has descending priority. The value on the highest priority level is written to the present value.

Relinquish Default
This value will be written to present value, if all values in the priority list are invalid.

Enter relinquish default value into the field.

3. To save changes, click the SUBMIT button.

For detailed description, please refer to the "Relinquish Default" and "Priority Level" sections.

View / Edit Event Enrollment Alarming

Event enrollment alarming can be used for observing the following datapoint properties:

- Present value
- Acknowledged transitions (datapoint alarms)
- Status flag conditions
- Elapsed active time / count limits
Present Value Observation

NOTE: The present value observation applies to all datapoint types.

Purpose

Observe exceedings of the high and low limits of the datapoint.

Procedure

1. In the Details dialog box of the selected datapoint, select the Event Enrollments tab.

Here you can select different event enrollments for viewing and editing. Each event enrollment is displayed as link. By default, event enrollments have the following naming convention <EE = event enrollment> <datapoint type abbreviation> <event enrollment type>, for example EE ai. Present Value.

2. To view/edit an event enrollment, click the event enrollment, for example EE ai. Present Value. The Details dialog box for the selected event enrollment displays. The Alarming tab is selected by default.
Algorithmic Reporting

Notification Class
   Shows the name of the notification class. The value in brackets is the BACnet object ID of the notification class.

Notify Type
   Shows the notify type. Defaults to 'event'. For details, see Notify Type property description

Event State
   Shows the event state. For details, see Event State property description.

Transitions
   Here the following data about transitions are shown:
   Event
   Shows the transition types that can be selected for reporting.
   Reporting
   Check the transition event(s) that should be observed and cause an event notification to the recipient (device or email addressee).
   - Back-To Normal
     An event notification is sent the recipient if the present value is within the high or low warning limits after the time delay has been expired.
   - To-Off Normal
     An event notification is sent the recipient if the present value exceeds or falls below the high or low warning limits within the time delay.
   To Fault
   This option has no function.

Ackn.
   Shows the Acknowledged status and allows acknowledgement.
   The acknowledged status (checked or unchecked), firstly depends on the Ack Required setting of the notification class in CARE. In CARE, for each transition type you can define whether an acknowledgement is required or
not. Secondly, the possibility to change the Ackn. status depends on the reporting status of the transition (enabled or disabled) here.

**Last Transition**
- Shows the date when the last transition has occurred.

**Event Parameters**
- **Event Type**
  - The event type is ‘change of state’.
- **High Limit**
  - Enter the high warning limit value.
- **Low Limit**
  - Enter the low warning limit value.

**NOTE:**
- The warning limits can be below or above the high and low limit reporting values.

**Deadband**
- Enter a deadband value. This defines an additional trigger to set off an alarm. The event enrollment alarm is sent if the following condition is true: present value must, for at least the defined time delay (time), remain within the range: Low limit plus deadband and high limit minus deadband.

**Suppress alarm**
- Check/uncheck this option if you want the alarming to be enabled/disabled.

**Time delay**
- Enter a time delay in sec. The even enrollment alarm is sent if the present value still increases or decreases the warning limits after the time entered here has been elapsed.

For details on the options below, please refer to the datapoint descriptions in the CARE User Guide.

3. Click SUBMIT button, and/or viewing general information of the event enrollment, click the General tab.

On the General the following information is displayed:

**Properties**
- **Object Type**
  - Defaults to event enrollment for all point types.
- **Description**
  - Shows the prefix of the event enrollment name as entered in CARE.

**Access Rights**
- Shows the read and write access level of the event enrollment.
  - To write values to a datapoint, you must have a write access level equal or higher than the write access level of the event enrollment.
  - Datapoint details will only be displayed if you have a read access level equal to or higher than the read access level of the event enrollment.

4. Click SUBMIT button to save settings, and then click CLOSE button.

**Acknowledged Transitions Observation**

**NOTE:** The acknowledged transitions observation applies to all datapoint types.

**Purpose**
- Allows observing the acknowledgement behavior of a user for To-Off-Normal and To-Fault transition events of the datapoint. CARE checks whether a transition event has been acknowledged or not. If a transition event has not been acknowledged within a definable delay time, an alarm based on an event enrollment (event enrollment alarm) is sent to a supervisory recipient, for example BACnet client.
**Procedure**

1. In the *Details* dialog box of the selected datapoint, select the *Event Enrollments* tab.

   Here you can select different event enrollments for viewing and editing. Each event enrollment is displayed as a link. By default, event enrollments have the following naming convention `<EE = event enrollment> <datapoint type abbreviation> <event enrollment type>`, for example EE ai. AckedTransitions.

2. To view/edit an event enrollment, click the event enrollment, for example EE ai. AckedTransitions. The *Details* dialog box for the selected event enrollment displays. The *Alarming* tab is selected by default.

   ![Event Enrollment Details](image)

   **Algorithmic Reporting**

   - **Notification Class**
     Shows the name of the notification class. The value in brackets is the BACnet object ID of the notification class.

   - **Notify Type**
     Shows the notify type. Defaults to `event`. For details, see Notify Type property description.

   - **Event State**
     Shows the event state. For details, see Event State property description.

   - **Transitions**
     Here the following data about transitions are shown:

     - **Event**
       Shows the transition types that can be selected for reporting.

     - **Reporting**
       Check the transition event(s) that should be observed and cause an event notification to the recipient (device or email addressee).

       - **Back-To Normal**
         An event notification is sent if the acknowledgement is sent after the time delay has expired.
− To-Off Normal
   An event notification is sent if the acknowledgement is missing within the
time delay

To Fault
This option has no function.

Ackn.
Shows the Acknowledged status and allows acknowledgement.
The acknowledged status (checked or unchecked), firstly depends on the
Ack Required setting of the notification class in CARE. In CARE, for each
transition type you can define whether an acknowledgement is required or
not. Secondly, the possibility to change the Ackn. status depends on the
reporting status of the transition (enabled or disabled) here.

Last Transition
Shows the date when the last transition has occurred.

Event Parameters

Event Type
The event type is ‘change of bitstring’.

Bit Mask
Shows the transition event(s) that are checked for acknowledgement.

Bit String(s)
Shows the possible logical values (true, false, CARE verifies with negative
logic for the false condition) resulting from the comparison of the selected
transition event(s) and the underlying bit string mask. An event enrollment
alarm will be sent, if the transition event will not be acknowledged within the
delay time.

Suppress alarm
Check/uncheck this option if you want the alarming to be enabled/disabled.

Time delay
Enter a time delay in sec. The event enrollment alarm will be sent if the
transition event has not been acknowledged within the delay time.

For details on the options below, please refer to the datapoint descriptions in
the CARE User Guide.

3. Click SUBMIT button, and/or viewing general information of the event
enrollment, click the General tab.

On the General the following information is displayed:

Properties

Object Type
Defaults to event enrollment for all point types.
Description
Shows the prefix of the event enrollment name as entered in CARE.

Access Rights
Shows the read and write access level of the event enrollment.

To write values to an event enrollment, you must have a write access level equal or higher than the write access level of the event enrollment.

Event enrollment details will only be displayed if you have a read access level equal to or higher than the read access level of the event enrollment.

4. Click SUBMIT button to save settings, and then click CLOSE button.

---

Status Flag Condition Observation

NOTE: The status flag condition observation applies to all datapoint types.

**Purpose**
Observe status flags conditions.

**Procedure**
1. In the Details dialog box of the selected datapoint, select the Event Enrollments tab.

Here you can select different event enrollments for viewing and editing. Each event enrollment is displayed as link. By default, event enrollments have the following naming convention <EE = event enrollment> <datapoint type abbreviation> <event enrollment type>, for example EE ai. StatusFlags.

2. To view/edit an event enrollment, click the event enrollment, for example EE ai. StatusFlags. The Details dialog box for the selected event enrollment displays. The Alarming tab is selected by default.
Algorithmic Reporting

Notification Class
Shows the name of the notification class. The value in brackets is the BACnet object ID of the notification class.

Notify Type
Shows the notify type. Defaults to ‘event’. For details, see Notify Type property description.

Event State
Shows the event state. For details, see Event State property description.

Transitions
Here the following data about transitions are shown:

- Event
  Shows the transition types that can be selected for reporting.

- Reporting
  Check the transition event(s) that should be observed and cause an event notification to the recipient (device or email addressee).
  - Back-To Normal
    An event notification is sent to the recipient if a status flag is disabled after the time delay has been expired.
  - To-Off Normal
    An event notification is sent to the recipient if a status flag is enabled within the time delay.

- To Fault
  This option has no function.

Ackn.
Shows the Acknowledged status and allows acknowledgement.

The acknowledged status (checked or unchecked), firstly depends on the Ack Required setting of the notification class in CARE. In CARE, for each transition type you can define whether an acknowledgement is required or not. Secondly, the possibility to change the Ackn. status depends on the reporting status of the transition (enabled or disabled) here.

- Last Transition
  Shows the date when the last transition has occurred.

Event Parameters

Event Type
The event type is ‘change of bitstring’.

Bit Mask
Shows the status flags that are observed.

Bit String(s)
Shows the possible logical values (true, false) resulting from the comparison of the selected status flags and the underlying bit string mask.

Suppress alarm
Check/uncheck this option if you want the alarming to be enabled/disabled.

Time Delay
Enter a time delay in sec. An event enrollment alarm will be sent for each status flag that is enabled (checked) within the time delay time.

For details on the options below, please refer to the datapoint descriptions in the CARE User Guide.

3. Click SUBMIT button, and/or viewing general information of the event enrollment, click the General tab.
On the General the following information is displayed:

**Properties**

Object Type
- Defaults to event enrollment for all point types.

Description
- Shows the prefix of the event enrollment name as entered in CARE.

**Access Rights**

Shows the read and write access level of the event enrollment.

To write values to a datapoint, you must have a write access level equal or higher than the write access level of the event enrollment.

Datapoint details will only be displayed if you have a read access level equal to or higher than the read access level of the event enrollment.

4. Click SUBMIT button to save settings, and then click CLOSE button.

---

**Elapsed Active Time / Count Limits Observation**

NOTE: The elapsed runtime and count limits observation applies to the following datapoint types: BI, BO, and BV.

**Purpose**

Allows observing the state of the elapsed runtime or the count limits.

**Procedure**

1. In the *Details* dialog box of the selected datapoint, select the *Event Enrollments* tab.
Here you can select different event enrollments for viewing and editing. Each event enrollment is displayed as a link. By default, event enrollments have the following naming convention `<EE = event enrollment> <datapoint type abbreviation> <event enrollment type>`, for example `EE ai. ElapsedActiveTime`.

2. To view/edit an event enrollment, click the event enrollment, for example `EE ai. ElapsedActiveTime`. The Details dialog box for the selected event enrollment displays. The Alarming tab is selected by default.

**Algorithmic Reporting**

**Notification Class**
- Shows the name of the notification class. The value in brackets is the BACnet object ID of the notification class.

**Notify Type**
- Shows the notify type. Defaults to `event`. For details, see Notify Type property description.

**Event State**
- Shows the event state. For details, see Event State property description.

**Transitions**
- Here the following data about transitions are shown:
Event
Shows the transition types that can be selected for reporting.

Reporting
Check the transition event(s) that should be observed and cause an event notification to the recipient (device or email addressee).
- Back-To Normal
  An event notification is sent if the elapsed active (elapsed) runtime, respectively number of state count changes takes a value within the high or low limit after the time delay has been expired.
- To-Off Normal
  An event notification is sent if the elapsed active (elapsed) runtime value, respectively number of state count changes value exceeds the high or low limit within the alarm.

To Fault
This option has no function.

Ackn.
Shows the Acknowledged status and allows acknowledgement.

The acknowledged status (checked or unchecked), firstly depends on the Ack Required setting of the notification class in CARE. In CARE, for each transition type you can define whether an acknowledgement is required or not. Secondly, the possibility to change the Ackn. status depends on the reporting status of the transition (enabled or disabled) here.

Last Transition
Shows the date when the last transition has occurred.

Event Parameters

Event Type
The event type is ‘unsigned range’.

High Limit
Enter the high limit value for the elapsed active (elapsed) runtime, respectively the number of state count changes.

Low Limit
Enter the low limit value for the elapsed active (elapsed) runtime respectively the number of state count changes.

Suppress alarm
Check/uncheck this option if you want the alarming to be enabled/disabled.

Time delay
Enter a time delay in sec. An event enrollment alarm will be sent if the elapsed active (elapsed) runtime, respectively the number of state count changes increases the high or low limit within the time delay time.

For details on the options below, please refer to the datapoint descriptions in the CARE User Guide.

3. Click SUBMIT button, and/ or viewing general information of the event enrollment, click the General tab.
On the General the following information is displayed:

**Properties**

Object Type
Defaults to event enrollment for all point types.

Description
Shows the prefix of the event enrollment name as entered in CARE.

**Access Rights**

Shows the read and write access level of the event enrollment.

To write values to a datapoint, you must have a write access level equal or higher than the write access level of the event enrollment.

Datapoint details will only be displayed if you have a read access level equal to or higher than the read access level of the event enrollment.

4. Click SUBMIT button to save settings, and then click CLOSE button.

---

**System Settings**

System settings include the following settings:

- System date, time and time zone
- Cycle time category (see also "Cycle Time Category" section).
- Communication settings which include:
  - Interface settings for Ethernet, LON, and Web-Server, such as IP address, neuron chip ID, automatic logout time of web server
  - User name and password definition

---

**View/Change Clock Settings**

**Procedure**

1. In the tree, expand the Advanced item, then the System Settings item and click on Clock.

RESULT: On the Date & Time tab on the right, the following clock values are displayed and can be changed:
Date
Displays current system date.

Time
Displays current system date.

Time Zone
Displays the current time zone.

2. To change the system date, enter the new system date in the **New System Date** fields, or click BROWSE button and select date in the calendar.

3. To change the system time, enter the new system time in the **New System Display Time** fields.

4. To synchronize all devices on the bus with the local time of the current controller, click **Time Synchronisation** button. This sets all devices on the bus supporting time sync to the current System Display Time of the selected controller.

5. To change the time zone, click on the **Time Zone Tab**.

6. Select another time zone from the **Current Time Zone** drop-down list box.
7. Check the **Automatically adjust Clock for Daylight Saving Changes** option.

8. To save changes, click the **SUBMIT** button.

**NOTE:** You can only change clock and time zone settings if your access level is equal to or higher than the access level defined for this action in the User Administration.

---

**View/Change Cycle Time Categories**

The cycle time category defines the (target) time in ms after a control loop is restarted automatically.

Target cycle times are grouped in the following categories with descending priority:

- Very Fast.
- Fast
- Medium
- Slow

In other words, a control loop which has the very fast category assigned, is executed more often in the same time.

Each control loop is assigned to one of these categories. Any changes done to the target cycle time will affect all control loops assigned to the corresponding category.

The controller executes multiple control loops simultaneously (multitasking). There is a dynamic relation between the target cycle time categories as shown in the following diagram:

---

**IMPORTANT**

It is recommended to set the cycle times to values to between 30 % and 50 % higher than the execution times in order to make sure that control loops having medium and slow cycle times assigned can be executed in appropriate time.
NOTE: The settings done in the Eagle Web Interface will be overwritten after a download with CARE. Hence, upload the application into CARE using Excel Online after the plant has been setup.

**Procedure**

1. In the tree, expand the Advanced item, then the System Settings item and click on Cycle Time Categories.

**RESULT:** On the Cycle Times Categories tab on the right, the following is displayed:
   - **Category**
     The cycle time category defines the time in ms after a control loop is restarted automatically (values see Target Cycle Time column).
   - **Target Cycle Time (ms)**
     Target cycle times are grouped in the following categories: Slow, Medium, Fast, and Very Fast.
   - **Actual Execution Time (ms)**
     The actual execution time is displayed for comparison in the Actual Cycle Time column.

2. To change the target cycle time, enter the value for the category in the Target Cycle Time (in ms) column. Note that the minimum cycle time in ms can only be increased but not decreased.

3. To save changes, click the SUBMIT button.

**NOTE:** Cycle time categories are only displayed and changeable if your access level is equal to or higher than the access level defined for these actions under User Administration.

---

**View/Change Communication Settings**

Communication settings include:

- Interface settings for Ethernet, LON, and Web-Server, such as IP address, neuron chip ID, automatic logout time of web server
- User name and password definition
- E-Mail Alarming

**Procedure**

1. In the tree, expand the Advanced item, then the System Settings item and click on Communication.
RESULT: On the *Interface Settings* tab you can view the Ethernet and LON bus settings in the areas of the same name. In addition, you can set the logout time of the web server (controller).

2. From the **Serial Port** drop-down list boxes, select the baudrates.

   The following properties are shown:

   **Host Name**
   Displays the name of the host (server).

   **Ethernet**
   Use this IP address for LAN Access
   The IP address has been explicitly allocated in CARE.
   − IP address
   − Subnet mask
   − Gateway address
   IP address for direct connection (through crossover cable)
   Network Card MAC Address

3. From **Automatic Logout Time**, select the time for logout of the web server. To deactivate logout, enter 0. The automatic logout time is the time of inactivity after you are automatically logged out and be redirected to the Login dialog.

   **NOTES:** The automatic logout time applies to the controller, not to the user. This means, that the current time set for the controller applies to all users which are currently logged in and access the controller.

   If ‘No automatic Logout’ is selected, you will be still logged in even if the web browser has been closed.

4. To save changes, click the **SUBMIT** button.

   **NOTE:** You can only change communication settings if your access level is equal to or higher than the access level defined for this action in the User Administration.

5. To view/change **E-Mail** settings, click on the **E-Mail** tab.
Common Settings
Here the e-mail alarming settings as entered in CARE are displayed.

DNS-Server1 IP Address
Shows the IP address of DNS server1.

DNS-Server2 IP Address
Shows the IP address of DNS server2.

SMTP Server
Shows the name or the IP address of the SMTP server.

E-Mail Address (Sender)
Shows the email address of the sender.

E-Mail Mode
Shows one of the following email modes:
- None
  Alarm emails are sent directly to the SMTP server of the DSL provider of the recipient. The Eagle can be accessed via port forwarding or VPN.
- Relay
  A relay server as the first SMTP server receives the email from the Eagle and sends it to a second SMTP server of the recipient. The relay server can reside in a customer network or at a DSL provider. The Eagle can be accessed via port forwarding or VPN.

E-Mail Subject Prefix String
Shows the default prefix of the email subject name. Default is ‘Alarm’.

E-Mail Send Repeat time
You can enable/disable and change the E-Mail Send Repeat time and enable/disable the email alarming as described in steps 17 through 22 of the “E-Mail Alarming” section.

Test E-Mail
Here you can perform an email test as described in steps 17 through 22 of the “E-Mail Alarming” section.

9. Click the SUBMIT button to save settings on the Interface Settings and E-Mail tabs.
View LON Diagnostic Data

Procedure

1. In the tree, expand the Advanced item, the System Settings item and then the Diagnostics item.

2. Click on LON Statistics.

   RESULT: The Statistics tab displays. Here you can select LON statistic properties for trending. The Active Trending checkbox shows whether trending is active or not. For each property its current value is displayed.

3. To display information of the property, click on the property in the list.

4. To reset all property values, click the RESET ALL button. Note that single properties cannot be reset.

5. To display trend records, check the properties you want to trend and click the TREND RECORDS button.

   RESULT: The Trend Records dialog box displays. Here you can display trended LON statistic properties for a defined time range. Note that the complete time range for trending is defined on the Settings tab.

6. To define the time range, for which the trended records should be shown, do the following:
   
   i. Click the From Date checkbox and enter the start date into the fields or select date by clicking the BROWSE button.
   
   j. In the Time fields enter the time.
NOTE:
If the checkbox is unchecked, the fields are disabled. This means that trended records will be shown on any date up to and including the end date.

k. Click the To Date checkbox and enter the end date into the fields or select date by clicking the BROWSE button.

l. In the Time fields enter the time.

NOTE:
If the checkbox is unchecked, the fields are disabled. This means that trended records will be shown on any date from the start date on.

NOTE:
If both fields are disabled, trended records will be shown instantly and all the time.

m. To display trend records for the defined time range, click the GO button.

RESULT: Under Trend Records, the found trend records will be listed. The statistic properties are listed columnwise.

For each property its value and timestamp when the property was recorded, are displayed. The records can be saved into a file.

7. To save the records, click the DOWNLOAD TREND FILE button and save the file to the desired location.
See Buffer Size Note.

8. To define trend settings, click on the **Trend Settings** tab. For further instructions on trending, please refer to the "Trend" chapter.

---

**View BACnet Diagnostic Data**

**Procedure**

1. In the tree, expand the **Advanced** item, the **System Settings** item and then the **Diagnostics** item.

2. Click on **BACnet**.

3. Click **Statistics** tab on the right pane.

RESULT: The BACnet statistics for Services, MS/TP and Miscellaneous are shown. The properties show the communication status and indicate communication problems.

In the **Initiated** column, the number of items performed by the Eagle (server) is listed. In the **Executed** column, the number of items generated by BACnet clients or other Eagle controllers are listed.
View Panel Bus Diagnostic Data

Procedure

1. In the tree, expand the Advanced item, the System Settings item and then the Diagnostics item.

2. Click on Panel Bus.

3. Click Statistics tab on the right pane.

RESULT: The Module List of the Panel bus is shown with the following properties for each module:

- Type
- Technical address
- Status (online, offline)
- Software version
- Terminal States (0 = no failure, 1 = failure, etc. open/shortcut of NTC sensor

SendOnDelta for Analog Inputs

Beginning with firmware 3-04-02-07, the following fixed SendOnDelta has been implemented for analog inputs:

- 0.5% for AI types: 0…10V / 0…20mA
  0…10V / 0…20mA with pull-up
  2…10V / 4…20mA
This was done in order to reduce the number of value updates, which could cause too high cycle times for high point count applications (> 500 IOs), and which could cause false fault alarms for Analog Inputs.

Adjustable Scan Cycle Time
Beginning with firmware 3-04-02-07, the scan cycle time per Panel-bus can be adjusted in as follows:

- fastest scan cycle time that can be set is 70 msec
- with CARE 10.05 the scan cycle time needs to be set after every application download
- upload into CARE is possible in CARE 10.06

View BACnet Diagnostic Data

Search Using “Who Has”

Purpose
The ‘Who Has’ function allows searching for BACnet objects and BACnet object identifiers (IDs).

Procedure
1. In the tree, expand the Advanced item, the System Settings item and then the Diagnostics item.
2. Click on BACnet, and then on the Who Has? tab.
3. Select corresponding radio button, **Object Name** or **Object Identifier** to define the search option.

4. If you search for object names, enter the search name in the **Name** field.

5. If you search for object identifiers, enter the identifier in the **Number** field.

6. Click **SUBMIT**.

RESULT: In the **Result** list, the findings are shown.

---

**BACnet Statistics**

**Purpose**

The BACnet statistics function can show the following BACnet statistics data:

- service statistics
- MS/TP statistics
- miscellaneous statistics

In addition, you can enable or disable IP-MSTP broadcast routing. Broadcast messages are "Who is", "I am", "Who has", "I have", and synchronizations between controllers.

Disabling IP-MSTP broadcast routing can reduce the network traffic on the BACnet MSTP network in order to optimize the pure MSTP communication speed.

Note that disabling IP-MSTP broadcast routing has the following side-effects:

- BACnet front-ends like EBI will no more be able to identify BACnet MSTP devices and their objects. This will become a problem after network disruptions and controller restarts.
- The following synchronizations will no more take place:
  - Calendar synchronization between IP channel and MSTP channel
  - User synchronization between IP channel and MSTP channel
  - Display of all bus-wide alarms of all controllers in the MSTP channel in the web-browser interface
Procedure

1. In the tree, expand the Advanced item, the System Settings item and then the Diagnostics item.

2. Click on BACnet.

3. Click the Statistics tab on the right pane.

RESULT: The BACnet statistics for Services, MS/TP and Miscellaneous are shown. The properties show the communication status and indicate communication problems.

In the Initiated column, the number of items performed by the Excel Web II (server) is listed. In the Executed column, the number of items generated by BACnet clients or other Excel Web II controllers are listed.

4. Enable or disable IP-MSTP broadcast routing by checking or unchecking Enable Broadcast Routing.

5. To disable IP-MSTP broadcast routing after a particular time, enter a time in minutes in Duration.

View Modbus Data

Procedure

1. In the tree, expand the Advanced item, the System Settings item and then the Diagnostics item.

2. Click on Modbus.

3. Click Port tab on the right pane.

RESULT: The Device List of the Modbus is shown with the following properties for each device:
- Address
  physical address of the device

- Communication
  shows the communication status:
  - online
  - offline

**View / Change M-Bus Data**

**Procedure**

1. In the tree, expand the *Advanced* item, the *System Settings* item and then the *Diagnostics* item.

2. Click on *M-Bus*.

RESULT: On the *Port* tab on the right pane, the Device List of the M-Bus is shown with the following properties for each device:
- **Address**
  primary address of the device

- **Type**
  measured medium, e.g. electricity. Assigned by the manufacturer

- **Status**
  Shows the current status of the status byte
  - **Ok** = all bits are 0
  - **Info** = at least one bit is 1
  please hover over the line to display a tooltip. The tooltip shows the bits that are set to 1. The bits have the following meaning:

<table>
<thead>
<tr>
<th>Bit</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>bit 1</td>
<td>bit 0</td>
</tr>
<tr>
<td>0</td>
<td>no error</td>
</tr>
<tr>
<td>0</td>
<td>application busy</td>
</tr>
<tr>
<td>1</td>
<td>any application error</td>
</tr>
<tr>
<td>1</td>
<td>reserved</td>
</tr>
<tr>
<td>1</td>
<td>low power</td>
</tr>
<tr>
<td>1</td>
<td>permanent error</td>
</tr>
<tr>
<td>1</td>
<td>temporary error</td>
</tr>
<tr>
<td>1</td>
<td>manufacturer specific error</td>
</tr>
<tr>
<td>1</td>
<td>manufacturer specific error</td>
</tr>
<tr>
<td>1</td>
<td>manufacturer specific error</td>
</tr>
</tbody>
</table>

please refer also to the related technical documentation of the manufacturer and to the actual M-Bus standard documentation: [http://www.m-bus.com/files/MBDOC48.PDF](http://www.m-bus.com/files/MBDOC48.PDF)

- **Communication**
  shows the communication status:
  - online
  - offline
  - not mapped
  one or multiple data records mapped in CARE could not be have been mapped in the controller
- Poll Rate (sec) shows the poll rate for the M-Bus in seconds. To change the poll rate, enter the value in the field and then click the Set Value button.

![Poll Rate (sec)](image)

- Data Record with Map Error shows the number of the first data record which could not have been mapped in the controller

- Last Access date and time of last access to the device by the controller

---

**Web Server Certificates**

Here you can install a trusted CA certificate ordered and received from a certification authority or a self-signed certificate created via an OpenSSL tool such as XCA.

**Procedure**

1. In the tree, expand the *Advanced* item, then the *System Settings* item and click on *Web Server Certificates*.

RESULT: The *Web Server Certificates* tab displays.

![Web Server Certificates](image)

2. Follow the instructions described on the tab.
Trend

Please refer also to the "Trending" section, p. 99.

**Procedure**

1. In the tree, expand the Advanced item and click on Trend.

   **RESULT:** The *Points in Trend* tab displays.

Here you can trend datapoints. Datapoints to be trended can be added and deleted from the Points in Trend list. Trending can be done in two ways, time-based or value-based. When using time-based trending, a datapoint value will be recorded in a defined log interval, e.g. every 30 seconds. When using value-based trending, a datapoint value will be recorded if its value has been exceeded by a certain amount, e.g. 0.1 °C. These values are called trend parameter.

Trending can be done for a defined time range. Trend result (trend records) can be saved in a file.

**NOTE:**

A trended point is only displayed if the user's access level is equal to or higher than the read access level of the trended point.

2. To add datapoints to the list for trending, click on the ADD button.

   **RESULT:** The *Add Points to Trend* dialog box displays.

3. Under **Datapoint Filter**, define the filter to display desired datapoints to be trended by doing one of the following:

   a. Under **Plant**, select plant(s) of which datapoints you want to be filtered by clicking the BROWSE button.
   b. Under **Point Type**, select the point type to be filtered.
   c. Under **Point Name**, specific datapoint names can be filtered by entering a search text. Wildcards can be used for filtering. By default all datapoints will be displayed as indicated by an asterisk. The filter function is case-sensitive. To display specific datapoint names, enter the desired search text.
   d. Click the GO Button to apply the filter.

   **RESULT:** All datapoints matching the filter criteria will be displayed under **Datapoint Selection** in the *Available Datapoints* list.

   Datapoints are selected/deselected from trend status by moving them between the *Available Datapoints* and the *Selected Datapoints* list.

4. To move datapoints between lists, do the following:

   a. Highlight the datapoint(s) to be moved in the *Available Datapoints* list. Multiselection by using the CTRL or the SHIFT key is possible.
   b. Or, click the checkbox at the point name in the *Selected Datapoints* list.
c. Click the SINGLE ARROW button with the desired direction.

5. Click the OK button.

RESULT: On the Points in Trend tab, the datapoints are displayed,

For each datapoint to be trended the following properties are shown:

- **Active (state)**
  Shows whether the datapoint is currently trended or not.
- **Enabled**
  Shows whether the trend logging is enabled or disabled. If enabled, the trending will start/stop in the defined time range.
- **Datapoint**
  Shows the datapoint name. Clicking the datapoint opens the datapoint details dialog for editing.
- **Property**
  Shows the property of the datapoint that will be trended
- **Type**
  Shows the trending type, value = value-based, or time = time-based
By clicking the CHANGE button, the type can be toggled in one step for all datapoints

- Each
  Shows the trend parameter
- Details
  Clicking on the entry opens the trend details dialog where the datapoint property and general settings such as time range, trend type and trend parameter can be defined.

6. **To delete a point in trend from the Points in Trend list, click the left checkbox in the datapoint row and click the DELETE button.**

7. **To enable logging, click the left checkbox in the datapoint’s row and click the ENABLE LOGGING button.**
   
   **RESULT:** That datapoint will then be trended in the defined time range as indicated by the checked **Enabled** checkbox.

8. **To disable logging, click the left checkbox in the datapoint’s row and click the DISABLE LOGGING button.**
   
   **RESULT:** That datapoint will not be trended as indicated by the unchecked **Enabled** checkbox.

   **NOTE:** You can only delete, enable, or disable logging, if your access level is equal to or higher than the write access level of the trended point.

9. **To change general trend settings such as time range and buffer settings for multiple datapoints in one step, click the left checkbox in the datapoints’s row and click the GENERAL CHANGES button.** This function can be used for defining settings for multiple datapoints in one step whereas defining settings for a single datapoint may be done by clicking the datapoint’s details in the last column.
10. Under **Set Trending Start / Stop Date and Time**, define the time range (start and stop date/time) by doing the following:

a. Click the **Start Date** checkbox and enter the start date into the fields or select date by clicking the BROWSE button.

b. In the **Time** fields enter the time.

**NOTE:**
If the checkbox is unchecked, the fields are disabled. This means, that trending will be performed up to and including the end date.

c. Click the **Stop Date** checkbox and enter the end date into the fields or select date by clicking the BROWSE button.

d. In the **Time** fields enter the time.

**NOTE:**
If the checkbox is unchecked, the fields are disabled. This means, that trending will be performed from the start date on.

**NOTE:**
If both fields are disabled, trending will start immediately and continues all the time.

e. Click the **OK** button.

11. Under **Buffer Settings**, you can define the trend buffer settings and clear the buffer for the selected datapoint(s) as follows:
f. Under **Set Buffer Size to**, enter the max. number of entries of the buffer (trend logging must be disabled). Click the OK button.

NOTE: The internal flash memory (2 MB) is capable of storing a maximum of 64,000 trend records distributed among a max. of 497 trend log objects. Each trend record allocates 30 bytes of memory. Based upon the internal flash storage selection, the default value for the max. buffer size is 2880 records, distributed among 24 trend log objects according to the calculation:

\[
\frac{2 \text{ MB}}{30} / 2880 = 24
\]

Based on the preceding calculation, external flash cards with capacities higher than 2 MB enable you to extend the no. of trend log objects and trend records to be saved.

**IMPORTANT**
Irrespective of the buffer size and the storage mode selected (internal or external flash, step d), it is recommended not to increase the default buffer size. Increasing the value above 2880 results in decreased performance when viewing and browsing trend record pages and creates additional effort when manually downloading trend records into a csv. file on the PC (step 21).

The maximum no. of storable trend records per download is 1550 independent of the no. of trend log objects selected. To reduce the no. of manual downloads necessary for the total download of trend records exceeding the max. no. of 1550, the date range can be set accordingly (step 19).

13. To view/change trend details of a single datapoint, click on its Details entry in the last column.

RESULT: The **Trend Details** dialog box displays.
14. Define trend settings for the single datapoint as follows:

**Trend Type**

a. Select trend type, time-based or value-based, by clicking the radio button.

When using time-based trending, a datapoint value will be recorded in a defined log interval, e.g. every 30 seconds. When using value-based trending, a datapoint value will be recorded if its value has been exceeded by a certain amount, e.g. 0.1 °C. These values are called trend parameter.

**Trend Parameter**

b. Enter the trend parameter value.

c. Depending on the trend type, time-based or value-based, enter the settings:

**Time-based**

In the **Log every** field, enter the time interval in h:m:s after which the value should be logged.

**Value-based**

In the **Log change greater** field, enter the range in excess of which the value should be logged. Each time the value change is greater than the value defined here, a trend value is logged into the trend buffer.

**NOTE:** For the log interval setting, the following guideline should be considered:

Based on the default log interval for time-based trending (1 minute) and the max. no. of trend log objects (497), a maximum of 8 trend records per second can be created:

$$\frac{497}{60} = 8 \text{ (limiting factor)}$$
For value-based trending, the default log interval should be estimated roughly by noting the no. of value changes which occurred within an appropriate time period.

Any calculations should result in a limiting factor of less than 8 (trend records per second).

**Example:**

You have a trend setting of 40 trend log objects with 1 trend record per minute plus 20 trend log objects with 1 trend record per 2 minutes. The result is an addition of the values as follows:

\[ \frac{40}{60} + \frac{20}{120} = 0.833 \Rightarrow \text{less than 2} \]

**Trending Start / Stop Date and Time**

Here you can define the time range (start and stop date/time) of the trending.

To define the time range, do the following:

d. Click the **Start Date** checkbox and enter the start date into the fields or select date by clicking the BROWSE button.

e. In the **Time** fields enter the time.

**NOTE:**
If the checkbox is unchecked, the fields are disabled. This means, that trending will be performed up to and including the end date.

f. Click the **Stop Date** checkbox and enter the end date into the fields or select date by clicking the BROWSE button.

g. In the **Time** fields enter the time

**NOTE:**
If the checkbox is unchecked, the fields are disabled. This means, that trending will be performed from the start date on.

**NOTE:**
If both fields are disabled, trending will start immediately and continues all the time.

If clicking the ENABLE LOGGING button enables the trend logging, the trending starts as soon as the start date/time is reached and ends at stop date/time. During trending the status is active as indicated as checked Active.

Stop of Trending is done by clicking the DISABLE LOGGING button (Status: Enabled=unchecked, Active=unchecked).

**Trend Buffer Settings**

Here you can define the trend buffer settings and clear the buffer.

Under **Entries in Buffer**, the current number of records is displayed.

Under **Buffer Size**, the max. buffer size can be set (trend logging must be disabled).

h. Enter buffer size.

**NOTE:**
The internal flash memory (2 MB) is capable of storing a maximum of 64,000 trend records distributed among a max. of 497 trend log objects. Each trend record allocates 30 bytes of memory. Based upon the internal flash storage selection, the default value for the max. buffer size is 2880 records, distributed among 24 trend log objects according to the calculation:

\[ \frac{2 \text{ MB}}{30} / 2880 = 24 \]

Based on the preceding calculation, external flash cards with capacities higher than 2 MB enable you to extend the no. of trend log objects and trend records to be saved.
IMPORTANT
Irrespective of the buffer size and the storage mode selected (internal or external flash), it is recommended not to increase the default buffer size. Increasing the value above 2880 results in decreased performance when viewing and browsing trend record pages and creates additional effort when manually downloading trend records into a csv file on the PC (step 21).
The maximum no. of storable trend records per download is 1550 independent of the no. of trend log objects selected. To reduce the no. of manual downloads necessary for the total download of trend records exceeding the max. no. of 1550, the date range can be set accordingly (step 19).

i. Select buffer type under:

Ringbuffer
The oldest record will be overwritten by the latest record when the buffer size is exceeded.

Stop when full
Trending is stopped when the buffer size is exceeded.

Internal Flash
The trend results are saved on the internal flash.

See previous Buffer Size Note.

j. To clear the buffer, click the CLEAR BUFFER button.

15. Click on the General tab to define general trend settings as follows:

Trend Log
In Name and Description, the trend log name and its description are shown. In Type/Instance, the type and instance is shown.

a. Change the name and/or the description if desired
b. Enable trending by clicking the ENABLE LOGGING (Status: Enabled=checked).
If the trend logging is enabled, the trending starts as soon as the start date/time is reached and ends at stop date/time. During trending the status is active as indicated by the checked Active option.

c. Manually stop trending by clicking the DISABLE LOGGING button (Status: Enabled=unchecked, Active=unchecked).

Start and Stop Date/Time is defined under Trending Start / Stop Date and Time on the Settings tab.

Trended Object
Here data about the trended object is displayed, such as:

Name
Shows the name of the trended object
From Controller
Shows the controller which the trend object belongs to
From Plant
Shows the plant which the trend object belongs to
Trended Property
Shows the property which is to be/has been trended. The property can be changed.

Access Rights
Here you can issue the access rights of the trend object

d. From the Read Access level drop-down list box, select the user level that should have the read access of the trend object.
e. From the Write Access level drop-down list box, select the user level that should have the write access of the trend object

15. Click on the Alarming tab to set the alarming for forwarding trend information to the BACnet client:

Intrinsic Reporting
a. In Notification Class, select a notification class
b. In Notification Threshold, enter the number of notifications before sending a new alarm
c. In Notify Type, select the notify type

In Records since Notification, the number of trend records since the last sent alarm, is shown.
In Last Notify record, the number of notified trend samples since the last alarm is shown.

d. Under Transitions, in the Reporting column, check the transitions that should be reported. In the Ackn column, check whether a transition must be acknowledged or not.

16. Click the SUBMIT button to save settings and then the CLOSE button.

RESULT: The Points in Trend tab redisplays.

17. To clear the trend buffer, click the left checkbox in the datapoint’s row and click the CLEAR BUFFER button. The buffer of that datapoint is now cleared.

18. To display trend records, click the left checkbox in the datapoint’s row and click the TREND RECORDS button.

RESULT: The Trend Records dialog box displays. Here you can display trended values for a defined time range.

19. To define the time range, for which the trended records should be shown, do the following (see also Buffer Size Note, step 11):

a. Click the From Date checkbox and enter the start date into the fields or select date by clicking the BROWSE button.

b. In the Time fields enter the time.

NOTE:
If the checkbox is unchecked, the fields are disabled. This means, that trended records will be shown up to and including the end date.

c. Click the Stop Date checkbox and enter the end date into the fields or select date by clicking the BROWSE button.

d. In the Time fields enter the time.

NOTE:
If the checkbox is unchecked, the fields are disabled. This means that trended records will be shown from the start date on.

NOTE:
If both fields are disabled, trended records will be shown immediately and continues all the time.

20. To display trend records for the defined time range, click the GO button.
RESULT: Under **Trend Records**, for each datapoint selected, the trended present value or the enable/disable trend status is shown (see next page).

21. To save the records, click the DOWNLOAD TRENDFILE button and save the file to the desired location (see also Buffer Size Note, step 11).

22. Click the CLOSE button to redisplay the **Points in Trend** tab.

### Alarms

Please refer also to the "Alarm Handling" section, p.85.

**Procedure**

1. In the tree, expand the **Advanced** item and click on Alarms.

RESULT: On the **Alarm Buffer** tab on the right, the alarms are displayed. The alarm buffer is a ring buffer with a capacity of 100 event entries.
**Alarm Filter**

Here you can create an alarm filter for displaying alarms by status (new, all), category (urgent, high, low) and by time range in the alarm list.

2. Under **Filter by Status**, select the status by clicking the radio button:

   - **Only New**
     Displays new alarms of the defined time range.
   - **All**
     Displays all alarms, regardless of their status, of the defined time range.

3. Under **Filter by Category**, mark the category under:

   - **Urgent**
     Displays all alarms with urgent priority
   - **High**
     Displays all alarms with high priority
   - **Low**
     Displays all alarms with low priority

   Multiselection by using the SHIFT or the CTRL key is possible.

4. To define the time range, do the following:

   e. Click the **Start Date** checkbox and enter the start date into the fields or select date by clicking the BROWSE button.
   f. In the **Time** fields enter the time.

   **NOTE:**
   If the checkbox is unchecked, the fields are disabled. This means, that alarms of any date up to and including the end date, will be displayed.

   g. Click the **Stop Date** checkbox and enter the end date into the fields or select date by clicking the BROWSE button.
   h. In the **Time** fields enter the time.

   **NOTE:**
   If the checkbox is unchecked, the fields are disabled. This means, that alarms of any date from the start date on will be displayed.

   **NOTE:**
   If both fields are disabled, all alarms of the alarm buffer will be displayed.

5. To display the alarms under **Alarm List**, click the GO button.
**Alarm List**
Here the alarms are displayed according to the applied alarm filter. The alarm list shows the most important properties of an alarm. Viewing the timestamp can show more details. On the top, the total number of alarms in the buffer and the number of new alarms since the last refresh are displayed.

For each alarm, the following properties are shown in the list:

**Timestamp**  
Shows the time, when the alarm has occurred. Newer alarms are highlighted in red. By clicking on the entry, alarm details can be viewed.

**Category**  
Shows the category of the alarm:
- **Urgent**  
  Alarm has urgent priority (range 0...84)
- **High**  
  Alarm has high priority (range 85...169)
- **Low**  
  Alarm has low priority (range 170...250)

**ToState**  
Shows the state of the alarm:
- **Normal**  
  The alarm is going to normal state, e.g. the value of the datapoint remains under the high alarm limit
- **To off-normal**  
  The alarm reaches off-normal state, e.g. the high alarm limit value is exceeded
- **Fault**  
  The alarm originates in a fault such as sensor break, etc.

**Alarm Source**  
Shows the datapoint name

**Value/Unit**  
Shows the value and unit. In case of BI, BV, MI, MV, it may be a new value, in case of AI, AO, AV it may be an exceeding value, in case of BO, MO, it may be a command value.

**Alarm Text**  
Shows the alarm message as defined in the Engineering tool.

The list can be sorted differently by clicking on the BROWSE button at the **Sort By** field.

**View Alarm Details**

**Procedure**  
1. In the **Alarm List**, click on the alarm entry in the **Timestamp** column.

**RESULT:** The **Alarm Details** dialog box displays. Here alarm details can be viewed under:
General
Displays alarm details, such as event type, alarm reason and alarm text.

Event Type
Different datapoints may cause different event types as shown in the following:

- **Change of state**
  Present value has changed to a new state for longer than the time delay.
  Can be caused by BI, BO, BV, MI, MO, and MV.

- **Out of range**
  Present value has exceeded range between high limit and low limit for longer than the time delay.
  Or, present value has returned between the high limit - deadband and the low limit + deadband range for longer than the time delay.
  Can be caused by AI, AO, and AV.

- **Command failure**
  Present value differs from feedback value for longer than the time delay.
  Can be caused by AO, BO, MO.

- **Acknowledged**
  (Not required)

**NOTE:**
Alarm acknowledgement is not applicable, hence alarms are set to NO by default.

Category
Shows the category:

- **Urgent**
  Alarm has urgent priority (range 0…84)

- **High**
  Alarm has high priority (range 85…169)

- **Low**
  Alarm has low priority (range 170…250)

Priority
Depending on the category, the alarm states NORMAL, OFF-NORMAL, FAULT have different values in the corresponding priority range. Hence, the priorities of the transitions (changes from one state to another state) are as follows:
Transitions

<table>
<thead>
<tr>
<th>Event (Alarm) Category</th>
<th>To Normal</th>
<th>To Off-Normal</th>
<th>To Fault</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urgent (range 0...84)</td>
<td>83</td>
<td>0</td>
<td>42</td>
</tr>
<tr>
<td>High (range 85...169)</td>
<td>168</td>
<td>86</td>
<td>127</td>
</tr>
<tr>
<td>Low (range 170...250)</td>
<td>250</td>
<td>171</td>
<td>210</td>
</tr>
</tbody>
</table>

**Transition Causing Alarm**

Displays the transition causing the alarm. Different datapoints may cause different event types as shown in the following:

- **Change of state**
  - Present value has changed to a new state for longer than the time delay.
  - Can be caused by BI, BV, MI, and MV.

- **Out of range**
  - Present value has exceeded range between high limit and low limit for longer than the time delay.
  - Or, present value has returned between the high limit - deadband and the low limit + deadband range for longer than the time delay.
  - Can be caused by AI, AO, and AV.

- **Command failure**
  - Present value differs from feedback value for longer than the time delay.
  - Can be caused by AO, BO, and MO.

- **From State ... To State**
  - Describes the event transition.

  Examples:
  
  - From Normal to Off-normal
  - From Off-normal to Normal

- **New Value**
  - Displays the new state of the datapoint, e.g. stage 1.

- **Deadband**
  - Shows the deadband

- **Status Flags**
  - Shows the set status flags:
    - **In Alarm**
      - When enabled, the datapoint is in alarm. Cause can be faults and Off-Normal conditions.
    - **Fault**
      - When enabled, the datapoint or the physical input is not reliable, e.g. in case of sensor break (Open Loop).
    - **Overridden**
      - When enabled, the datapoint is in manual operating state. The value has been overwritten.
    - **Out of Service**
      - When enabled, the physical input is decoupled from the datapoint, e.g. in case of manual override for inputs. The present value displayed is not the present value, which would be delivered by the physical input.

  **NOTE:** Multiple flag indications may be possible.

  **Example:**

  A “To-Fault transition” causes also always an alarm. Hence both, the “In Alarm” and the “Fault” status flags are enabled.

- **Alarm Text**
  - Displays the alarm text (message) and the alarm description.

2. Click the CLOSE button after having viewed the alarm details.
Control Loops

Please refer also to the "Control Loops" section, p. 99.

View Control Loop Information

**Procedure**

1. In the tree, expand the Advanced item and navigate to the control loop, you want to display.

2. Click on the control loop.

**RESULT:** On the right, the Control Loop displays information such as name and description, execution parameters and access rights.

**General**
Displays name and description of the control loop.

**Cycle Information**
- **Cycle Time Category**
The cycle time category defines in ms how often the loop will be automatically executed by the controller. Cycle times are grouped in the following categories: Slow, Medium, Fast, and Very Fast.
- **Last Execution Time**
This is the actual execution time in ms of the loop. Allows, e.g. detecting overruns by comparing the actual execution time with the assigned cycle time.
- **Priority for Writing**
Displays priority with which the loop writes to the output.

**Access Rights**
Displays access rights.

**NOTE:** Control loop information will only be displayed, if the access level of the user is equal to or higher than the read access level of the control loop. Changing control loop information is only possible if the user’s access level is equal to or higher than the write access level of the control loop.
Parameters are used for configuration and tuning of the application program via control loop. A typical example of a parameter is the Integral Time of the PID control function.

Parameters are part of a control icon which itself is part of a control loop which itself is part of a plant, etc. Hence, the parameter can be described and addressed by its path as follows:

plant – control loop – control macro - control icon – parameter

Example: airconditioning.contloop1.supply_temp.integral time

A parameter is defined by:

- Name
- Value
- Engineering unit/state text

Parameters belong to control icons and define the icon behavior. Control icons will be interconnected within a control loop that performs a control program. A control loop itself can also have parameters. Control icons can internally be composed of other icons (control macro). For example, a XFM is a control macro. Control macros can have max. 4 internal control icons. It will not be distinguished between parameters of input and output control icons. Parameters can be written to and read from the control program. However parameters cannot be prioritized. The parameters origin (location) will be shown as path with the following structure: plant-control loop-control icon.

NOTE:
If no parameters are displayed, one of the following may be the reason:

A) You do not have the user rights to read control loops and parameters

or

B) All or some of the parameters have been intentionally engineered in CARE not to be displayed in the Eagle Web Interface.

Procedure

1. In the tree, expand the Advanced item, then the Plants item and navigate to the Parameters item.

2. Click on Parameters.

RESULT: On the right, the Parameters tab displays. Here you can display and edit parameters. Under Display Settings, you define the display type. Under Parameters, the parameters are displayed according to your display type selection. Here parameter values can be changed too.
Display Settings

a. Select how the parameters should be displayed by clicking corresponding radio button:

Drill Down View
Displays parameters of the plant/control loop as hierarchical structure. Parameters can be accessed by navigating through the hierarchical structure. Only the parameters of the current selected level (plant or control loop) are displayed.

Example:
Since the plant itself has no parameters, on plant level only the control icons are displayed as folders.

Flat View
Displays parameters of the plant as non-hierarchical structure. All parameters of selected loops are listed concurrently with their path. Parameters can be filtered by control loop assignment, path and name.

NOTE: Only the parameters of those control loops are displayed of which read access level is equal to or lower than the access level of the user.

You can only change values of parameters that belong to control loops of which read access level is equal to or lower than the access level of the user.

Parameters (Drill Down View)
If Drill Down View has been selected as display type, the parameters of the plant are displayed as hierarchical structure (drill down view). A tool icon indicates parameters. Folder icons below the parameters indicate control macros. Parameters can be accessed by navigating through the hierarchical structure. While navigating, the current path (separated by dots) will be
displayed in the Path field. Downward navigation is done by clicking on the entry in the Name column. Upward navigation is done by clicking on the Upward icon at the Path field.

For parameters the following properties are shown:

Name
To edit a parameter, click on its name in the Name column.

Value/Unit
Current value and associated engineering unit (analog) / state text (discrete)

Symbol Type
Shows the control icon name which the parameter belongs to. If the parameter belongs to a loop, LOOP will be displayed.

Parameter Filter
If Flat View has been selected as display type, you can define a filter for displaying parameters filtered by control loop assignment, path and name.

b. Under Control Loops, click the BROWSE button to select the control loop(s) of which parameters you want to display.

Under Parameter path, parameters of a specific path can be filtered by entering a search text. By default all paths will be displayed as indicated by an asterisk.

c. To display specific parameters filtered by the path, enter the appropriate search text.

Under Parameter Name, specific parameter names can be filtered by entering a search text. By default all parameters will be displayed as indicated by an asterisk.

d. To display specific parameters filtered by the name, enter the appropriate search text.

e. To apply the filter, click the GO button.

Parameters (Flat View)
If Flat View has been selected as display type, the parameters of the plant are displayed as non-hierarchical structure (flat view).

All parameters of selected loops are listed concurrently with their path.

Parameters can be accessed by navigating through the path. While navigating, the current path (separated by dots) will be displayed in the Path field.

Downward navigation is done by clicking on the entry in the Parameter Path column. Upward navigation is done by clicking on the Upward Path column. When the parameter is reached by clicking on the corresponding entry under Parameter Path, it is always displayed on top of the list and the path shows one dot. Control icons and control macros always follow parameters in the list and their path is shown accordingly.
The parameters can be sorted column wise. To sort the list, click the BROWSE button at the Sort by field.

For parameters, the following properties are shown:
- **Parameter Path**
  - Shows the path of the parameter. By clicking on the entry, you can browse downwards the path.
- **Name**
  - To edit a parameter, click on its name in the Name column.
- **Value/Unit**
  - Current value and associated engineering unit (analog) / state text (discrete)
- **Symbol Type**
  - Shows the control icon name which the parameter belongs to. If the parameter belongs to a loop, LOOP will be displayed.

### Change Parameter

**Procedure**

1. In the list under **Parameters**, click on the parameter in the Name column. If the parameters are not displayed, navigate through the parameter path by clicking as follows:
   - Downward navigation is done by clicking on the entry in the Parameter Path (Flat view) column or Symbol Type column (Drill Down View). Upward navigation is done by clicking on the Upward icon at the Path field. When the parameter is reached it is displayed and accessible in the Name column.

2. In the Name column, click on the parameter you want to change.
RESULT: The Parameter Value dialog displays.

3. Click the DETAILS << button, if you want to display additional information such as plant name, control loop name, parameter path and symbol type.

   Example: If a parameter belongs to the symbol ‘boiler switch’ (SWI) which is part of the symbol ‘XFM21’, which is part of the control macro ‘heating circuit’, which is subprogram of control loop ‘loop 1’ which controls the plant ‘plant 3’, the following is shown:

   Symbol Type:   SWI
   Parameter Path: Heating Circuit.XFM.Sub01.Boilwer Switch
   Control Loop:  Loop 1
   Plant:   Plant 3

4. In the **New Value** field, enter the parameter value and click the SUBMIT button.
RESULT: The parameter is updated in the parameter list.

### Loop Objects

**Purpose**

The loop object provides the PID control function for usage on the BACnet bus. For detailed description of the PID control function, please refer to the Control Icons User Guide. For descriptions of BACnet terms, please refer to standard BACnet documentation (e.g. the BACnet ANSI / ASHRAE Standard).

The loop object can only be used in one and the same controller. Hence, datapoints from other controllers cannot be assigned to the loop object.

**View/Edit Loop Object**

**Procedure**

1. In the tree, expand the *Advanced* item and navigate to the plant that contains the loop objects.
2. Click *Loop Objects* folder.

RESULT: On the right, the Loop Objects tab displays.

On the Loop Objects tab, the loop objects are displayed in the below Loop Objects List.

For each loop object, the following properties are shown:
• Name
  Shows whether the datapoint is currently trended or not.
• Description
  Shows whether the trend logging is enabled or disabled. If enabled, the trending will start/stop in the defined time range.
• Manipulated Value / Unit
  Shows the manipulated value of the assigned output datapoint.
• Controlled Value / Unit
  Shows the controlled value of the assigned input datapoint.
• Setpoint Value / Unit
  Shows the setpoint value of the assigned input datapoint.
• Event State
  Shows the event state (Normal, To-Off-Normal, Back-To-Normal)
• ALM, FLT, OVR, OOS
  Status flags indication for alarm, fault, overridden and out of service.

3. In the upper Loop Objects Filter area, you can filter loop objects as follows:
   h. In Name, enter a name to filter based on the loop objects name.
   i. Check Points in Alarm to filter loop objects that contain points currently in alarm state, and then click GO button.

4. In the below Loop Objects Lists, you can sort the list by clicking the BROWSE button (see "Basic Function" section for details on filtering).

5. To edit loop object properties, click the name of the loop object in the Name column.

RESULT: The Loop Object Details dialog box displays.
6. To edit loop object properties, do any of the following:
   
a. In **Proportional Constant (Xp)**, enter the value for the proportional band.
b. In **Derivative Constant (Tv)**, enter the value for the derivative time, and in **Integral Constant (Tn)**, enter the value for the integral action time.
c. In **Bias**, enter an offset value.
d. In **Maximum Output**, enter the maximum value.
e. In **Minimum Output**, enter the minimum value.
f. In **Update Interval**, **Action**, **Reliability**, and in **Value of Priority for Writing** the current values are displayed.
g. In **Status**, check the flags you want to be controlled. Note that not all flags are possible for loop objects.
h. Under **Change of Value**, enter the COV value in the **Increment** field.
i. Click **SUBMIT** to save settings, or continue with editing other details by selecting the corresponding tab, e.g. the Alarming, References, Event Enrollments, or General tab.
j. When selecting the Alarming tab, do any of the following:
k. Under **Reporting**, check/uncheck which transition type (To-OffNormal, Back To-Normal, or To Fault) will be tracked or not tracked by timestamping. Note that the reporting settings can be pre-defined in CARE, hence some transitions types may already be enabled.
l. In **Error Limit**, enter the absolute value for the difference between the controlled variable value and the setpoint (error) that must be exceeded before a 'To Offnormal' event is generated. Please consider the input of an alarm delay.

m. In **Deadband**, define the value of the deadband in order to set off an alarm of event type 'To-Normal'. For this, the present value must, for at least the defined alarm delay (time), remain within the range:
   
   Low limit plus deadband and high limit minus deadband.

n. Check **Suppress Alarm** if alarms should not be generated. Or, uncheck **Suppress Alarm** if alarms should be generated. In case of the generation of alarms setting an alarm delay time is recommended in order to avoid alarms in case of overshoots.

o. In **Alarm Delay**, enter an alarm delay (only enabled if Suppress Alarm is disabled).

q. Click **SUBMIT** to save settings, or continue with editing other details by selecting the corresponding tab, e.g. the References, Event Enrollments, or General tab.

r. When selecting the References tab, do any of the following:
s. View the current datapoint values of the referenced variables.

t. If desired, click the datapoint in **Name** to edit the datapoint details of the assigned datapoint. For editing details of datapoints, please refer to the "View / Edit Datapoint Details" section.

u. Click **SUBMIT** to save settings, or continue with editing other details by selecting the corresponding tab, e.g. the Event Enrollments or General tab.

v. When selecting the Event Enrollments tab, do any of the following:
In the Links list, click the event enrollment you want to edit. The corresponding Event Enrollment Details dialog box displays. For editing details of event enrollments, please refer to the "View / Edit Event Enrollment Alarming" section.

Click SUBMIT to save settings, or continue with editing other details by selecting the corresponding tab, e.g. the General tab.

When selecting the General tab, you can view the following general settings:

- Loop Object Name
- Type
- Description
- Read Access Level
- Write Access Level
Enable Event Enrollment Alarming

Event enrollment alarming can be enabled for the following project parts:

Plant
See “Enable Event Enrollment Alarming for Plant” section in the following.

Controller
See “Enable Event Enrollment Alarming for Controller System Status” section in the following.
See “Enable Event Enrollment Alarming for Controller Email Alarming” section in the following.

Datapoints
See “View / Edit Event Enrollment Alarming” in the “Operating the Eagle Web Interface” section.

Enable Event Enrollment Alarming for Plant

Purpose
Enable the Event Enrollment Alarming for the plant.
Procedure

1. In the tree, expand the Advanced folder, and then click on the plant.

2. On the right pane, click the Event Enrollments tab.

3. To enable event enrollment alarming for the plant, click the PlantStatus link.

RESULT: After selecting PlantStatus event enrollment, the Event Enrollment Details dialog box displays. The Alarming tab is selected by default. Here the following algorithmic reporting settings defined in CARE are displayed:

- Notification Class
- Notify Type
- Event State
- Transitions (Acknowledged status and time and date of last transition)
- Event Type
- BACnet Property State
- Program State(s) (=Off-Normal-States)

You only can select the transitions to be reported and set the delay time.
4. Under **Transitions**, check the transition events that should trigger the event enrollment alarming. Refer to the relevant To-Off-Normal transitions listed under **Program State(s)**.

   Example: When selecting ‘To-Off-Normal’, each transition from ‘RUNNING’ (Normal State) to any of the Off-Normal States, for example ‘HALTED’, will cause an event enrollment alarm.

5. In the **Time Delay** field, enter a time delay in sec. The event enrollment alarm will be sent after the time entered here, has been elapsed.

6. Click **SUBMIT** button.

7. To view general event enrollment properties, click the **General** tab. Here the following properties set in CARE are shown:
   - Object Type
   - Description
   - Read Access Level
   - Write Access Level
8. Click CLOSE button.

Enable Event Enrollment Alarming for Controller System Status

**Purpose**
Enable the Event Enrollment Alarming for the controller’s system status.

**Procedure**
1. In the tree, click on the controller.
2. On the right pane, click the *Event Enrollments* tab.

RESULT: On the *Event Enrollments* tab, you can select event enrollments to enable the system status alarming and the Email alarming:

3. To enable event enrollment alarming for the controller’s system status, click the *SystemStatus* link. To enable event enrollment alarming for the controller’s email alarming, see “Enable Event Enrollment Alarming for Controller Email Alarming” section.

RESULT: After selecting the *System Status* event enrollment, the *Event Enrollment Details* dialog box displays. The *Alarming* tab is selected by default. Here the following algorithmic reporting settings defined in CARE are displayed:
• Notification Class
• Notify Type
• Event State
• Transitions (Acknowledged status and time and date of last transition)
• Event Type
• BACnet Property State
• BACnet Device State(s) (=Off-Normal-States)

You only can select the transitions to be reported and set the delay time.

4. Under **Transitions**, check the transition events that should trigger the event enrollment alarming. Refer to the relevant To-Off-Normal transitions listed under **BACnet Device State(s)**.

   **Example:** When selecting ‘To-Off-Normal’, each transition from ‘OPERATIONAL’ (Normal State) to any of the Off-Normal States, for example ‘DOWNLOAD REQUIRED’, will cause an event enrollment alarm.

5. In the **Time delay** field, enter a time delay in sec. The event enrollment alarm will be sent after the time entered here, has been elapsed.

6. Click **SUBMIT** button.

7. To view general event enrollment properties, click the **General** tab. Here the following properties set in CARE are shown:
   • Object Type
   • Description
   • Read Access Level
8. Click CLOSE button.

**Enable Event Enrollment Alarming for Controller Email Alarming**

**Purpose**
Enable the Event Enrollment Alarming for the controller’s email alarming.

**Procedure**
1. In the tree, click on the controller.
2. On the right pane, click the Event Enrollments tab.

**RESULT:** On the Event Enrollments tab, you can select event enrollments to enable the controller’s system status alarming and the alarming of the controller’s Email alarming:

3. To enable event enrollment alarming for the controllers email alarming, click the EmailAlarming link. To enable event enrollment alarming for the controller’s system status, see “Enable Event Enrollment Alarming for Controller System Status” section.

**RESULT:** After selecting the System Status event enrollment, the Event Enrollment Details dialog box displays. The Alarming tab is selected by default. Here the following algorithmic reporting
settings defined in CARE are displayed:

- Notification Class
- Notify Type
- Event State
- Transitions (Acknowledged status and time and date of last transition)
- Event Type
- BACnet Property State
- BACnet Device State(s) (=Off-Normal-States)

You only can select the transitions to be reported and set the delay time.

4. Under Transitions, check the transition events that should trigger the event enrollment alarming. Refer to the relevant To-Off-Normal transition listed under BACnet Device State(s).

   Example: When selecting 'To-Off-Normal', each transition from 'EMAIL_INPROCESS' (Normal State) to any of the Off-Normal States, for example 'EMAIL_FAILED', will cause an event enrollment alarm.

5. In the Time delay field, enter a time delay in sec. The event enrollment alarm will be sent after the time entered here, has been elapsed.

6. Click SUBMIT button.

7. To view general event enrollment properties, click the General tab. Here the following properties set in CARE are shown:

   - Object Type
Description
Read Access Level
Write Access Level

8. Click CLOSE button.

Email Alarming

Sending an alarm per email to a recipient is triggered by the notification class defined for the datapoint.

Email addresses must be assigned to users (recipients) that should receive the corresponding alarm emails and to notification classes.

Email assignments can be done in CARE and in the Web Interface.

Prerequisites
With CARE, the controller settings including the email settings must have been downloaded into the controller. The application must be running.

Procedure
1. In the tree, expand the Advanced item and click on User Administration.

2. On the right, click the User tab, and the click the user in the list.
RESULT: The New / Edit User Profile dialog box displays.

3. Click Edit button.

RESULT: The New Address Entry dialog box displays.

4. In the Name field, enter the email address, and then click OK.

RESULT: The New User Profile dialog box redisplays. The email address is added under E-Mail Address.

5. Click OK.

RESULT: On the User tab, the email address is assigned to the user as displayed in the E-Mail Address column of the selected user.

6. In the tree, expand the Advanced item and click on Alarms.

7. On the right pane, click the E-Mail Address Assignment tab.
8. Click the notification class that you want to apply for sending the email alarm, for example, URGENT.

RESULT: The New / Edit E-Mail Address Assignment dialog box displays.

9. In Assignable Addresses, select the email address(es) you want to assign to the notification class.

10. Click the Right-Arrow button.

RESULT: The E-Mail address is assigned. **Under Assigned Addresses** on the right, all email addresses assigned to the notification class are displayed. The recipients with the emails listed will receive the alarms of the selected notification class.
11. Choose options and enter values for the valid time period under **From Time, To Time**, **Mo, Tu, We, Th, Fr, Sa, Su**.

12. Check the **To-Off Normal**, **Back-to Normal**, and/or **To Fault** transitions.

13. Click OK.

RESULT:  The **E-Mail Address Assignment** tab redisplays. For the edited notification class, the assigned email address and the selected options are displayed in the respective columns.

14. Click OK.

15. Expand the tree, and then click on **Communication**.

16. On the right pane, click the **E-Mail** tab.
17. Under **Test E-Mail**, enter the email address of the recipient in the **Recipient** field and the subject in the **Subject** field. The recipient email address is normally the same email address you have entered as **Crash E-Mail Address** in CARE.

18. Click **Send** button.

**RESULT:** Under **E-Mail Status**, the sending status is shown. Note that it may take a few seconds due to the defined refresh interval of the Eagle Web Interface. If the test was successful, the email status shows ‘Send Email successfully’. If the email was not sent successfully, try to find out what the error is by checking the procedure described in the previous steps. Correct the errors and perform the test again.

19. Check your email box for the received test email.

20. If the email test is successful, check **E-Mail Feature Enabled**.

Checking the **E-Mail Alarming Enabled** check box instantly enables the controller sending emails when alarms occur.

**NOTE:** When firstly setting up the email alarming function, do not check this option unless you have performed the email test. It is recommended to check this option only when you are sure that the entered data are correct and emails will be sent to the right recipient, by using the existing and already tested ‘email send path’.

**Example:**
Reuse of the established email send path after application modifications and subsequent application download

21. On the E-Mail tab, change the **E-Mail Send Repeat Time (Minutes)** if desired. After the time interval in minutes, entered here, the email is repeatedly sent to the recipient. Check the **Off** checkbox, if you want to turn off the repeated sending of emails, for example when using the Test E-Mail function. Turning off the option may result in the loss of particular emails if the first attempt of sending the email has failed.

22. In the tree, click **Alarms**, and then click **E-Mail Alarming** tab on the right to view the email transmission result. Under **Last E-Mail Transmission Result**, the following data are shown:

<table>
<thead>
<tr>
<th>E-Mail Status</th>
<th>TimesStamp: 11/15/2012, 17:37:25</th>
</tr>
</thead>
</table>

- **E-Mail Status**
  Shows the status of the last sent email, for example ‘Send Email Successfully’ or ‘Send Email Status Not Available’.

- **TimeStamp**
  Shows the date and time of the last email status.

Under **E-Mail Alarm Send Queue**, emails are listed which, for some reason, have not been sent yet. The emails are shown with the following properties:

- **To(Recipient)**
  Shows email address

- **Subject**
  Shows <Alarm><datapoint name>

- **Timestamp**
  Shows the date and time of the last email status.

- **Total Alarms in E-Mail**
  Shows the number of alarms included in the email

- **Notification Class**
  Shows the notification class
The XWADMIN.INI file of EAGLE firmware 2.02.02 and newer contains various entries which can be used for troubleshooting. The file is located in the /usr/local/etc/ folder and inactive by default.

**Ignore Remote Devices**
In large BACnet systems with FALCON controllers and MS/TP devices, FALCON controllers can harm the MS/TP devices because each FALCON controller adds all BACnet devices to his device list. To avoid this, the option ‘Ignore Remote Devices’ can be applied in order not to import the information of remote devices that reside in channels such as MS/TP or BACnet over LON.

**Default:**  
BACnetConnection: IgnoreRemoteDevices=0

- 0 = add remote devices
- 1 = ignore remote devices

The active setting can be checked by collecting the diagnosis files using the FTP diagnosis tool. If remote devices are ignored, the file ‘BACnetDevList’ should not contain MS/TP devices.

**NOTE:** If the entry ‘IgnoreRemoteDevices’ has been changed, the controller must be restarted in order to apply the changes.
AUTOMATIC SAVING OF ONLINE CHANGES

Online changes done via the Eagle Web Interface or via the BACnet client like the BACnet client will be automatically saved every 80 seconds to the non-volatile onboard Flash memory in the Eagle controller. The save cycle is not done more often in order to protect the lifetime of the Flash memory. Changes of the control loop parameters or datapoint properties initiated by the control loops are stored in intervals of 24 hours.

Eagle Controller and Communication Failures

In case of communication failures, the Eagle controller behaves as follows:

Operating system is stopped
- The watchdog causes a restart of the controller. On the physical controller this is not visible. In the Eagle Web Interface this is indicated by the interrupted browser access.
- BACnet client indicates 'Controller Offline'
- If a restart of the controller fails, the watchdog relay blocks. If the binary output is used as alarm connector, the connected device gives a visual or acoustic alarm.
- BACnet client indicates 'Controller Offline'

Voltage drop
- Restart of the controller.
  On the physical controller this is not visible.
- BACnet client indicates 'Controller Offline'.

Network cable damaged
- Link LED on the controller is OFF (depending on failure).
- BACnet client indicates 'Controller Offline' during the time of power failure and controller restart.

LON bus not accessible, LON cable break, or LON node not available
Identifying LON communication failures must be done in the application, for example, by using one datapoint of the module that represents the LON module.

The datapoint must be handled as follows:

- General: assign alarm text
- For inputs: activate heartbeat
- For outputs: set acknowledged service

The datapoint alarm created due to the LON failure is displayed in the BACnet alarm list.
The following behavior indicates an overload of the Eagle controller:

- Multiple controller restarts due to Web Interface access
- Racl execution times are close to or larger than the cycle time

<table>
<thead>
<tr>
<th>Action to find Cause</th>
<th>Result of Action</th>
<th>Cause</th>
<th>Action to Resolve Overload</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Stop the BACnet communication of the BACnet Client</td>
<td>Immediate faster Racl Execution Times</td>
<td>Too many ReadProperty / ReadPropertyMultiple from BACnet client</td>
<td>Change BACnet client’s tuning parameter: Sample period to use COV / RPM to force more COVs and less RPMs</td>
</tr>
<tr>
<td></td>
<td>Execution time slowly decreasing</td>
<td>Too many COV Notifications</td>
<td>Increase COV Hysteresis</td>
</tr>
<tr>
<td></td>
<td>Execution time not decreasing</td>
<td>Unknown</td>
<td>Continue with action 2.</td>
</tr>
<tr>
<td>2. Unplug Ethernet</td>
<td>Execution time decreasing</td>
<td>Load comes from COV of point references</td>
<td>Increase COV Hysteresis of point</td>
</tr>
<tr>
<td></td>
<td>Execution time not decreasing</td>
<td>Application too big for required cycle time -&gt; increase cycle time.</td>
<td></td>
</tr>
</tbody>
</table>
The EAGLE firmware includes the following components:

- Linux
- XW System
- XW Main

The following describes the controller boot and watchdog behavior process.

### XW System
The XW system has the following functions:

- Controls the XW Main process
- Communicates with CARE (Date/Time and IP settings)
- Triggers watchdog every sec.

If the watchdog is not triggered within 20 sec, a cold boot will happen.

**NOTES:**
The watchdog does not "supervise" the CARE application, it "supervises" the Operating System of the Eagle controller.

### Controller Restart

**NOTE:** A controller restart (power-cycle or re-boot) will stop logging and will erase all logging data, since logging data is only stored temporarily ("temp" folder) in order to avoid endless logging and accumulation of huge log files.
TROUBLESHOOTING

For troubleshooting, please access the Honeywell Technical Assistance Center Europe at:

http://web.ge51.honeywell.de/tac
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