FasBAC for Hotels II
User Manual

Version 3.0

A division of Fastek International Inc.
3075 14th. Avenue, Suite 217
Markham, ON L3R 0G9
Canada
905.474.0909

www.afdtek.com

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Introduction

FasBAC for Hotels II (or **FasBAC** for short) provides integration of BACnet BACnet/IP networks to hospitality industry Project Management Systems that utilize the Comtrol Corporation Lodging Link integration products.

FasBAC is a Windows application that runs in the background as a Windows service. It can be deployed on any Intel-based PC running a Windows operating system.

Minimum Requirements

Lodging Link

Comtrol Corporation Lodging Link II, Lodging Link Premier or Lodging Link PTS

Communications

TCP/IP on Ethernet 10/100/1000BaseT

Platform

Intel-based PC running Windows 7 Professional, Windows 10, Windows 2008 Server, or Windows 2012 Server.

(The use of AMD-based PCs is currently not supported and is therefore not recommended.)

Note: FasBAC <u>cannot</u> reside on the same PC as Lodging Link PTS.

Theory of Operation

A hospitality industry facility such as a hotel typically has a number of specialized systems for managing different aspects of a guest's visit. These systems include a Property Management System (PMS) and one or more Guest Services Systems (GSS). GSSs may include the telephone PBX system, POS systems, maid services, movie rental systems and other services.

Comtrol Corporation has developed a hospitality industry specific protocol (UHLL) as a standard for data interchange between these disparate systems. The UHLL protocol is implemented in the Comtrol Lodging Link products, to which the PMS and GSSs all connect. The Lodging Link routes UHLL messages between the PMS and the GSSs. GSS or PMS vendors can enable their systems to interface with the systems of numerous other vendors by including a UHLL protocol interface in their product.

FasBAC is a BACnet device designed to connect a BACnet network to the Lodging Link. It enables any BACnet network to be another Guest Services System. BACnet is a standard communications protocol widely supported in the building automation system (BAS) industry. By using FasBAC, any BACnet based BAS may be used to implement facility wide energy management strategies that take into account guest room usage.

Given the room occupied state, energy conservation strategies for unoccupied rooms can include:

- Automatically lower the heating setpoint
- Automatically raise the cooling setpoint
- Turn off lights or other discretionary electrical loads
- Enable security on doors and windows

When the first guest checks into a room, the room will become "occupied." At this time, the BAS can perform any of the following functions:

- Automatically raise the heating setpoint or adjust the temperature control band available to the guest
- Automatically lower the cooling setpoint or adjust the temperature control band available to the guest
- Enable lights or other discretionary electrical loads
- Disable "unoccupied room" security strategies

FasBAC acts as an interface between the Lodging Link and a BACnet network.

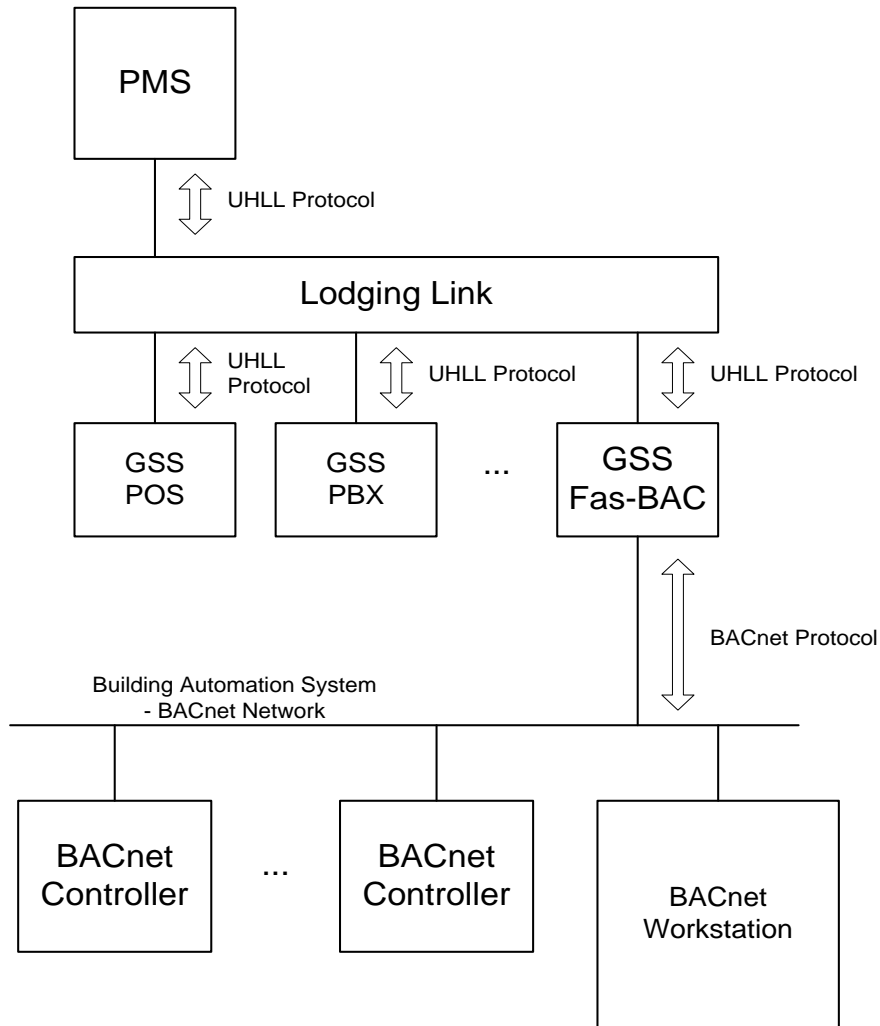The system architecture is illustrated in Figure 1.

Figure 1. Property Management System Architecture with Integrated BAS

There is more than one model of Lodging Link. For the purposes of illustration, the next figures illustrate the Lodging Link II. The Lodging Link II supports the inter-connection of up to eight systems. These systems may use either Ethernet connections, RS232 serial connections or a combination of the two to connect with the Lodging Link II. Figure 2 illustrates the physical inter-connection of several systems using only Ethernet communications media.

Figure 2. All Hospitality Systems use Ethernet

Note that the Lodging Link II has only one Ethernet port. An all Ethernet solution will require that all the systems are either on the same physical Ethernet or can be routed to the subnet where the Lodging Link resides.

In Figure 3 is illustrated an arrangement where the building automation system and FasBAC use Ethernet and the PMS and other GSSs use RS232 links to the Lodging Link II.

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Figure 3. Mixed RS232 Serial and Ethernet Connections
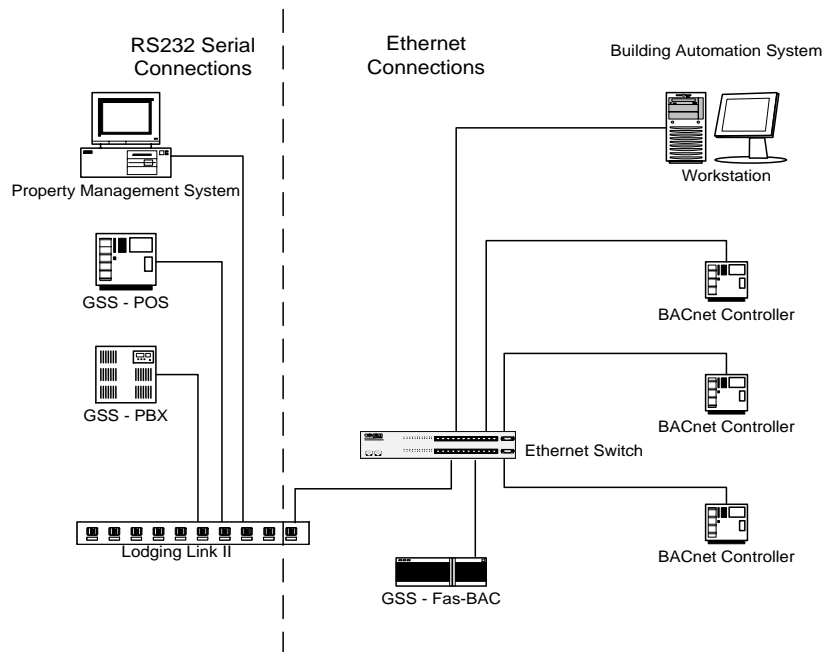
Description of Operation

FasBAC communicates with the Lodging Link using the UHLL protocol. FasBAC monitors the UHLL protocol for room transactions. In response to a room check in or room check out transaction, FasBAC will write a status update to a designated BACnet Binary Input or Binary Value object. Updates will occur in real-time. FasBAC does not store room status information in itself.

When FasBAC starts running, it will synchronize the BACnet objects with the current room states. The FasBAC initialization will perform the following steps:

1. Read the contents of the fasbac.csv file.
2. Create an in-memory table of room numbers cross-referenced to BACnet objects.
3. Check whether the Lodging Link is on line.
4. Update the Present Value property of the BACnet object that represents the Lodging Link status.
5. Poll the Lodging Link for the current room status of all rooms.
6. Update the Present Value property of all BACnet objects of all rooms.
7. Update the room table to flag off-line any BACnet objects that could not be written to.
8. Begin listening for room check in/ Check out updates.

If a BACnet object property could not be written, FasBAC will write a BACnet object off-line message to the Windows Application Event log. For each off-line object, FasBAC will periodically send a BACnet Who-Has message to determine whether the BACnet object has come on-line. If the off-line BACnet object comes on-line, FasBAC will ask the Lodging Link for the current state of the room and will then write the status to the BACnet object. A BACnet object on-line message will be written to the Windows Application Event log.

Note that if the BACnet network is not fully commissioned at the time that FasBAC is put on-line, FasBAC's polling for off-line BACnet objects will generate unnecessary BACnet network traffic. It may be desirable to include only the commissioned BACnet objects in the FasBAC.csv file.

Summary of BACnet write operations:

BACnet Value	0	1
Lodging Link Status	Offline	Online
Room Status	Unoccupied	Occupied

Lodging Link Configuration

Configure the Lodging Link per the instructions that are provided with the Lodging Link. The GSS definition for FasBAC can be found listed under the 'Energy Management' category on the Comtrol Corporation web site. The FasBAC product is listed as:

Manufacturer: Fastek International

Lodging Link II uses the UDP protocol to communicate with networked PMS and GSS systems. Lodging Link PTS supports both the UDP and the TCP protocols to communicate with networked PMS and GSS systems. For FasBAC for Hotels, the Lodging Link GSS port *must* be set to UDP.

The Lodging Link configuration assigns specific ports to each GSS. Each port must be configured with the IP address and UDP port used by the associated GSS. Each system will use a different IP address and UDP port. Lodging Link requires devices connected to it to use a static IP address.

IP addresses will normally be obtained from the IT staff or other personnel responsible for network services. For security reasons, an IT network may block access to UDP ports. For this reason, UDP port numbers must be communicated to and approved by the network's IT staff.

The default UDP Port for FasBAC is 28674. If another port must be used, a change will have to be made using the **FasBAC for Hotels II Config Utility** (more on that later).

FasBAC Installation

Before installing FasBAC, make sure your Windows user ID has Windows administrative rights.

To install FasBAC, run Setup.exe and follow the onscreen instructions. FasBAC will install as a Windows service. After the installation has completed, the user must launch the **FasBAC for Hotels II Config Utility** to configure the FasBAC service. The shortcut to this application can be found either on the Desktop or in the Start Menu:

> *Start->All Programs-> Fas-BAC for Hotels II -> FasBAC for Hotels II Config Utility*

FasBAC for Hotels II Config Utility

This tool provides a convenient way to configure all the FasBAC settings. The configuration utility (see Figure 4) also allows the user to manage the BACnet object definition file (fasbac.csv) and the FasBAC software license.

Note: FasBAC comes pre-configured with typical settings. In most circumstances, all the user needs to configure is the Lodging Link IP address and UDP Port Number before starting the service.

Figure 4. Main Window

The configuration utility is divided into 3 main sections.

- **BACnet** – deals with settings related specifically to the BACnet network
- **Lodging Link** – deals with settings related to the connection between FasBAC and the Lodging Link interface
- **FasBAC for Hotels II Service** – allows the user to control the service directly as well as to see its current status

Last but not least, from within the main window, the user can also launch:

- **License Manager** – launches an external application which deals exclusively with software licensing

- **Open CSV File** – launches the fasbac.csv file so it can be edited
- **Even Log** – launches the Windows Event Log, where FasBAC records runtime error and status information.

*Note: If any of the settings in the dialog box are changed, you must use the **Apply** button for the changes to be saved and take effect.*

*If changes are made to the fasbac.csv file, you must save the file from the editing program and then use the **Restart** button found in FasBAC for Hotels II Service section to cause the service to read in the BACnet object changes.*

BACnet

The default values for Device ID and Device Name may come into conflict with other BACnet devices by virtue of not being unique. If that is the case, they must be changed. BACnet requires that all BACnet devices have a unique device name and unique device ID. If two or more BACnet devices have the same name or ID, communications with those devices may not be reliable.

The UDP port number network must be the same as all other BACnetIP devices on the same BACnet network. In most cases the default value of 47808 does not need to be changed.

Figure 5. BACnet Related Settings

The following lists the parameters and describes them in detail:

Device ID   Defines the BACnet device ID of FasBAC. This value must be unique on the BACnet network. If any other BACnet device on the network has this BACnet ID, this will have to be changed.

> **Range:** 1 - 4194302
> **Default Value:** 64001

Device Name   Defines the BACnet device name of FasBAC. This value must be unique on the BACnet network. If any other BACnet device on the network has this name, this will have to be changed.

> **Range:** up to 32 characters (case sensitive)
> **Default Value:** FASBAC1

UDP Port Number   Defines the BACnet UDP port when the media is BACnetIP. This port number must be the same as that of the BACnet devices FasBAC must communicate with.

> **Range:** 1024 - 49151
> **Default Value:** 47808

Media	Defines the BACnet media. **Range:** Ethernet, BACnetIP **Default Value:** BACnetIP
Reset Objects	Enables an optional BACnet behaviour that will compensate for Property Management Systems that do not send a Folio Information message for rooms that are currently checked out. When this option is set to True and the Lodging Link comes on line to FasBAC, FasBAC will initialize all BACnet objects to state 0. Then, as status updates are received for each room, FasBAC will update the BACnet status to match the status received from the Lodging Link. **Range:** False, True **Default Value:** False (disabled)
Windowless	Enables *Windowless* mode. It must be checked for FasBAC for Hotels II to run. Windowless is a parameter of a library DLL that FasBAC uses and that may also be used by other BACnet applications. This setting may potentially become unchecked should a different BACnet application is installed or run on the PC on which FasBAC is installed.
Offline Polling Rate	Defines the rate at which FasBAC will send BACnet Who-Has messages to locate BACnet objects that are defined in the room number to BACnet cross reference list. **Range:** 1 - 60 minutes **Default Value:** 1

Lodging Link

Before the FasBAC service can operate, the user needs to ensure that the IP address and the UDP port number match those used by the Lodging Link interface.

Figure 6. Lodging Link Related Settings

Comm. Method   Defines the communications media to use with the Lodging Link device.

> **Range:** Ethernet
> **Default Value:** Ethernet

Message Interval   Defines the minimum interval between data request messages sent to the Lodging Link.

> **Range:** 1 - 60 seconds
> **Default Value:** 1

I.P. Address   Defines the Ethernet address of the Lodging Link device. This value will initially be empty. It must be entered before FasBAC can communicate with the Lodging Link.

> **Range:** n.n.n.n format
> **Default Value:**

UDP Port Number   Defines the UDP port of the Lodging Link device.

> **Range:** 1024 - 49151
> **Default Value:** 28674

Max Num. of Error Msgs.   Defines the maximum number of consecutive error messages FasBAC will receive from the Lodging Link device before putting an error in the log file.

> **Range:** 1 - 10
> **Default Value:** 3

Offline Polling Rate   Defines the rate FasBAC will poll the Lodging Link device when the Lodging Link is off-line to FasBAC.

> **Range:** 1 - 60 minutes
> **Default Value:** 1

Online Polling Rate   Defines the maximum time FasBAC will wait for a message from the Lodging Link device before polling the device to verify it is still on-line to FasBAC.

> **Range:** 1 - 600 seconds
> **Default Value:** 60

Fas-BAC for Hotels II Service Control

The service control section of the config. utility allows the user to control the service directly. The current status of the service is also displayed and it will either show Running, Stopped or Starting/Stopping/Paused depending on the state the service is in.

Figure 7. Service Control Panel

License Manager, CSV and Event Log

Figure 8. Launch Centre for Additional Related Applications and the CSV File

License Manager

Every copy of FasBAC ships with a limited full license. The license is limited to 10 rooms and is also time limited. The period of evaluation is 2 hours at which point FasBAC will automatically stop working.

If FasBAC is started without a full license, the demo splash screen shown in Figure 9 will be displayed.

Figure 9. Demo Splash Screen

To purchase a full license contact the AFDtek office and submit to them the Machine ID of the computer running FasBAC. Use the License Manager to obtain the Machine ID.

To launch the License Manager, click the **License Manager** button found in the FasBAC for Hotels II Config Utility. The License Manager window will open in front of the config utility, as shown in Figure 10.
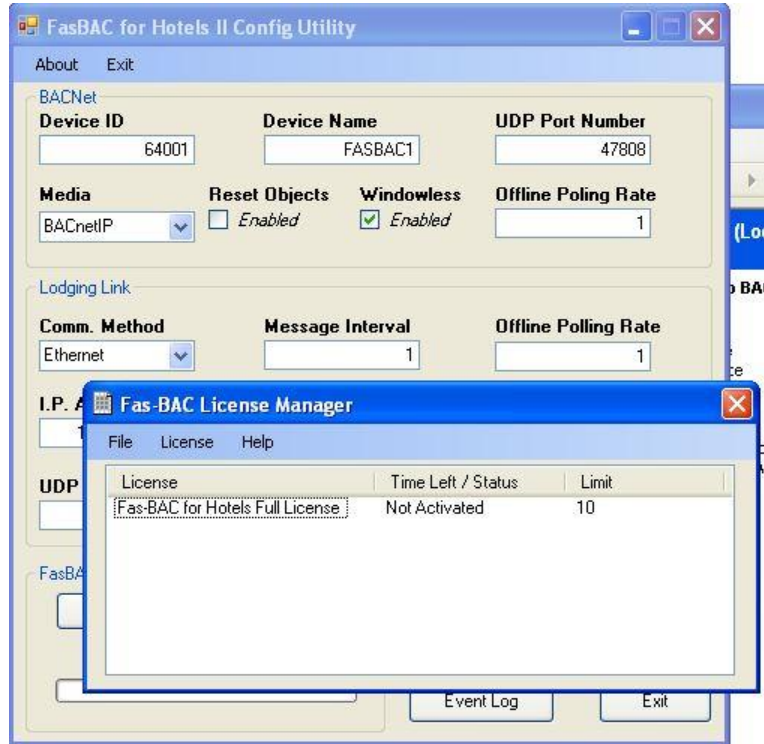
Figure 10. License Manager Application

Select *License* from the top menu then click the *Generate Machine ID* command. A message box will be displayed containing the Machine ID, as shown in Figure 11.
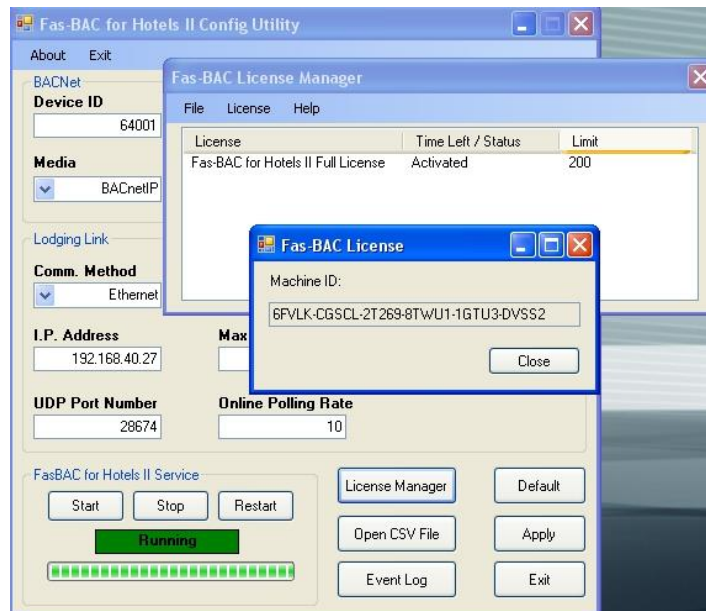

Figure 11. Machine ID Obtained Using the License Manager

Licenses offered by AFDtek come in 4 sizes:

1. 200 room limit
2. 500 room limit
3. 1000 room limit
4. Unlimited

Install a License

After an appropriate license has been purchased, AFDtek will supply you with a license file and a serial number based on the Machine ID provided.

Following the receipt of the license file and the serial number from AFDtek, open the License Manager to install the license file.

1. Click on the *License* menu and select the *Install* command.
2. Follow the on screen instructions.

Activate a License

Installing only the license file will give the user 30 days of full usage. During those 30 days you must activate the license with the serial number. License activation can be done when installing the license file or at any later time. To activate the license:

1. Open the License Manager.
2. Select the license in the main window of the License Manager.
3. Click on the *License* menu and select *Activate*.
4. Follow the on screen instructions.

Deactivate a License

The license can also be deactivated to allow for re-location of the FasBAC software to another machine. To deactivate a license:

1. Open the License Manager.
2. Select the license in the main window of the License Manager.
3. Click on the *License* menu and select Dea*tivate*.
4. Follow the on screen instructions.

Note: If at any time you require more help, select Help in the License Manager top menu and click on Contents to launch a full featured help file.

FasBAC Configuration File (fasbac.csv)

As stated earlier, the FasBAC configuration file (CSV) is necessary for FasBAC to operate properly. FasBAC ships with a template CSV file that must be edited prior to starting the service. To edit the CSV file, click the **Open CSV File** button found in the FasBAC for Hotels II Config Utility. This will launch the file for editing.

Note: By default fasbac.csv will open in Windows Notepad unless another third party program is present that handles .csv files. An example is Microsoft Excel.

The FasBAC configuration file is used to cross reference hotel rooms to BACnet objects. FasBAC monitors the message traffic from the property management system for check in and

check out messages for the rooms listed in the file. When a check in or check out message is received, FasBAC updates the corresponding BACnet object to indicate the new state.

- Hotel rooms are identified with the number or name used by the property management system; for example: 321 or "Bridal Suite"
- BACnet objects are identified by either their BACnet object name or by their BACnet device ID and object instance ID; for example: "Room 1 Status" or 100|124

The file uses a comma delimited format that may be edited using either a text editor such as Windows Notepad or with a spreadsheet program such as Microsoft Excel. When using a spreadsheet program as an editor, the file must be saved as a CSV format file. The file format is illustrated here:

```
// Definition for the BACnet object that indicates comm status.
LodgingLinkStatus, BACnet_Object_Name, BACnet_Object_Type


// Definitions for the room objects. Two formats are supported:
// Hotel_Room_Name, BACnet_Object_Name, BACnet_Object_Type
// Hotel_Room_Name, Device_Instance | Object_Instance, Object_Type


Hotel_Room_Name, BACnet_Object_Name, BACnet_Object_Type
Hotel_Room_Name, Device_Instance | Object_Instance, Object_Type
```

Note: If the BACnet_Object_Name is longer than 32 characters **you must use** the format
```
Hotel_Room_Name, Device_Instance | Object_Instance, Object_Type
```

The following rules will apply to the data in the CSV file:

Comments

- Comments are prefixed by a double slash
- If using a spreadsheet program to create the file, the double slash prefix must be entered in the first column of the spreadsheet
- Comments may be entered on any line in the file

Hotel_Room_Name

- The name 'LodgingLinkStatus' is a reserved name used to designate the BACnet object that will indicate the state of communications to the Lodging Link
- The Hotel_Room_Name is the room designation used by the Property Management System. Examples are: "1234", "State Room 3", "Bridal Suite"
- The room designation must match exactly the designation used by the Property Management System
- Hotel room names are not case sensitive

BACnet_Object

- One BACnet room status object for each room must be defined on other BACnet devices on the network. FasBAC does not have internal objects of its own for representing the rooms
- The BACnet room status object must be a Binary Value object

- The BACnet room status object name does not need to match the PMS name for the room, but it will usually be a good idea for it to do so
- BACnet objects may be defined in the CSV file using either their BACnet object name or the BACnet device instance number of the device containing the object and the object's BACnet object instance number
- If the BACnet object name is used, the object name must be unique on the BACnet network. FasBAC cannot differentiate between two objects with the same name on different devices. It also must be 32 characters or shorter in length. If the same BACnet object name exists on different devices or the name is longer than 32 characters, the object instance number syntax must be used to specify the BACnet room status object
- Object names are case sensitive
- If the BACnet object name is used, the object type is optional
- If the BACnet object name is used and an object type is specified, the type of the actual object will be validated
- If the BACnet object instance number is used, the BACnet device instance number of the device containing the object must be prefixed to the object instance number using the pipe symbol (|) as a separator
- If the object instance number is used, the device instance number and object type are required
- The BACnet object property written will be the Present Value property (85)
- The object type is indicated with BV (Binary Value)

Examples of acceptable data entry:

```
// Definition for the BACnet object that indicates comm status.
LodgingLinkStatus, Lodging Link Com

// Definitions for the room objects. Two formats are supported:
// Hotel_Room_Name, BACnet_Object_Name, BACnet_Object_Type
// Hotel_Room_Name, Device_Instance | Object_Instance, Object_Type

124, Status Room 124, BV
Bridal Suite, Status Bridal Suite, BV
125, 103|125, BV
                        .
                        .
                        .
```

Note: Any changes made to the CSV file must be followed by restarting the service so those changes can take effect.

Event Log

FasBAC uses the Windows Event log in the operating system for recording advisory and error messages. During setting up or if you have a reason to believe that FasBAC is not operating correctly, you can launch the Windows Event Viewer by clicking the **Event Log** button found in the Fas-BAC for Hotels II Config Utility.

With the Event Viewer opened:

1. In the left hand pane, click on the *Application* item. The right hand pane will then display the list of application events.

2. Review events from FasBAC. FasBAC events will have a source of 'FasBAC to UHLL Protocol Service'.

    Note: The view does not dynamically update. If you are expecting new messages, periodically refresh the view by selecting *Action* then *Refresh* from the menu.

3. Review other events. Events generated by the operating system may affect the operation of FasBAC.

4. When you have finished reviewing events, select *File* then *Exit*.

FasBAC Log Messages

FasBAC will log messages for the following events:

- Lodging Link offline
- Lodging Link online
- BACnet object offline
- BACnet object online
- Missing or corrupt fasbac.csv file
- Invalid fasbac.csv file syntax
- Licensing issues, such as room limit for the current license reached.
- Internal errors caused by failures of Windows systems calls

Some error conditions are fatal, i.e. the FasBAC application will not run while the condition exists. For example; if the fasbac.csv file is missing, FasBAC will not run. If a fatal exit message is logged, review the messages immediately prior to the fatal exit for additional clues to the cause of the exit.

FasBAC may be started after a fatal exit has occurred simply by using the Start button found in the FasBAC for Hotels II Config Utility. Note, however, that if the cause of the error has not first been corrected, the FasBAC application will simply once again suffer the same fatal exit.

Disabling FasBAC

The FasBAC service can be stopped easily using the FasBAC for Hotels II Config Utility. To completely disable FasBAC, use the Windows Uninstaller to uninstall the FasBAC for Hotels II software package. The Windows Uninstaller can be found under Windows Control Panel – Add/Remove Programs.