

Description: Guide to setting up BACnet and browsing for BACnet data

OS Requirement: Win 2000, XP Pro, Server 2003, Vista, Server 2008, Windows 7

General Requirement: Installation of GENESIS32 v9.2x

Introduction

BACnet is "a data communication protocol for Building Automation and Control networks." A data communication protocol is a set of rules governing the exchange of data over a computer network. The rules take the form of a written specification that spells out what is required to conform to the protocol. BACnet communication is special because the rules relate specifically to the needs of building automation and control equipment, i.e., they cover things like how to ask for the value of a temperature, define a fan operating schedule, or send a pump status alarm.

BACnet Client-Server Architecture

BACnet is based on a "client-server" model of the world; BACnet messages are called "service requests." A client machine sends a service request to a server machine, the server then performs the service and reports the result to the client. BACnet defines more than thirty-five message types that are divided into five groups or classes. For example, one class contains messages for accessing and manipulating the properties of the objects described above. A common one is the "ReadProperty" service request. This message causes the server machine to locate the requested property of the requested object and send its value back to the client. Other classes of services deal with alarms and events; file uploading and downloading; managing the operation of remote devices; and other powerful BACnet features.

BACnet specification (135-2004) supports the following objects:

- | | |
|----------------------|----------------------|
| • Binary Input | • Calendar |
| • Binary Output | • Notification Class |
| • Binary Value | • Command |
| • Analog Input | • LifeSafetyPoint |
| • Analog Output | • File |
| • Analog Value | • Program |
| • Averaging | • Schedule |
| • Life Safety Zone | • Trend Log |
| • Multi-state Input | • Group |
| • Multi-state Output | • Event Enrollment |
| • Multi-state value | • Device |
| • Loop | |

NOTE: From ICONICS point of view, the above types are part of a known specification. But we can only perform read/write operations. That means, we cannot read whole buffer for Trend Log, we cannot evaluate Events and etc. But, we can read how many events are there,

how many samples for trend is there and etc. Basically we can display only Data Sharing operations in GENESIS32 clients (reading/writing values from/to properties).

Browsing BACnet Devices

From nature of BACnet protocol it is not possible to run two BACnet-related applications on same machine (because it exclusively uses UDP port 47808 by default). From this reason you have to have other BACnet device(s) (simulator which is part of GENESIS32 installation) running somewhere else on same network as client is. Please note that BACnet device can be software running on any OS as well as dedicated hardware device. BACnet address space is generated based on replies from other devices during network and device discovery process result. This process is started each time BACnet Runtime starts – you request anything from BACnet Runtime (e.g. by selecting My Computer while you’re in Data Browser – tab BACnet).

This application note describes how to browse for the data on the network and how to read the data by ICONICS GraphWorX32 client. You can follow the steps below to read the data from BACnet device:

1. Start GraphWorX32 from Start → Programs → ICONICS GENESIS32 → GraphWorX32 → GraphWorX32.
2. Create a new process point on your GraphWorX32 display and click on “Process Point” button  and then click somewhere on display canvas to place it and to browse for the BACnet data.
3. When Unified Data Browser is opened you need to click on BACnet tab (GenBroker Plugin) and select an appropriate input as shown on figure below.

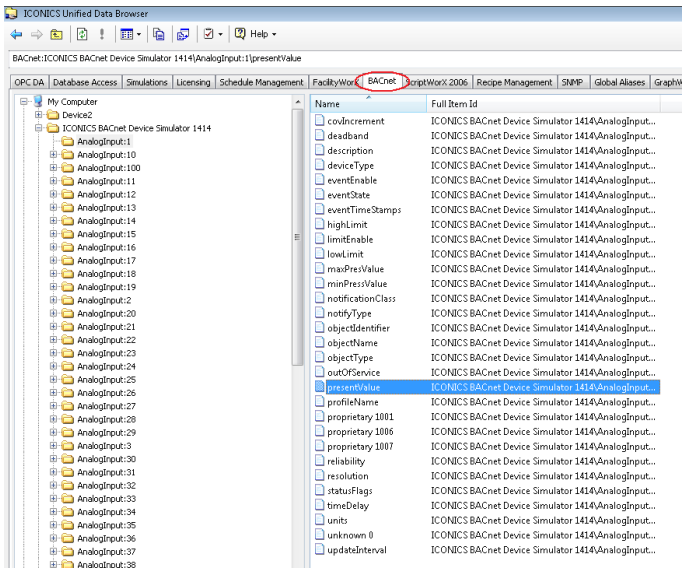


Figure 1 – Browsing BACnet device

NOTE: Usually, there is a “presentValue” which provides the current value from that device.

4. Click OK to confirm the selection.
5. Please notice PPT syntax for BACnet and click OK.
6. Switch to Runtime and you should see the similar output as shown on figure below.

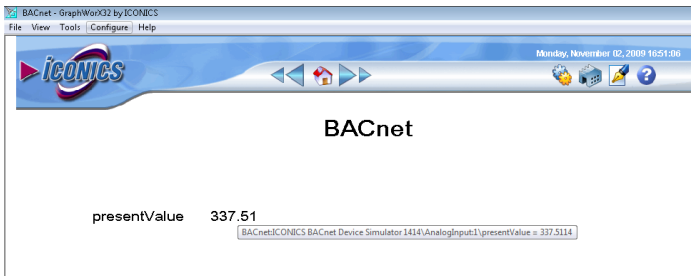


Figure 2 – BACnet data in GraphWorX32 runtime

Understanding BACnet Address Space

BACnet address space contains the following tokens below and it is very important to understand how it is designed. Here is an example on which it can be shown:

bacnet:ICONICS BACnet Device Simulator
498\AnalogInput:1\presentValue

where

- **bacnet:** is the Genbroker plug-in prefix which indicates it is BACnet Process Point
- **ICONICS BACnet Device Simulator 498** is the BACnet Device name with unique ID 498
- **AnalogInput:1** translates to the <ObjectType>:<Instance ID>, please note that it is possible to use unique object name which is given object instance using or use this <ObjectType>:<Instance ID> syntax for unique identification
- **presentValue** is the <Property name>