

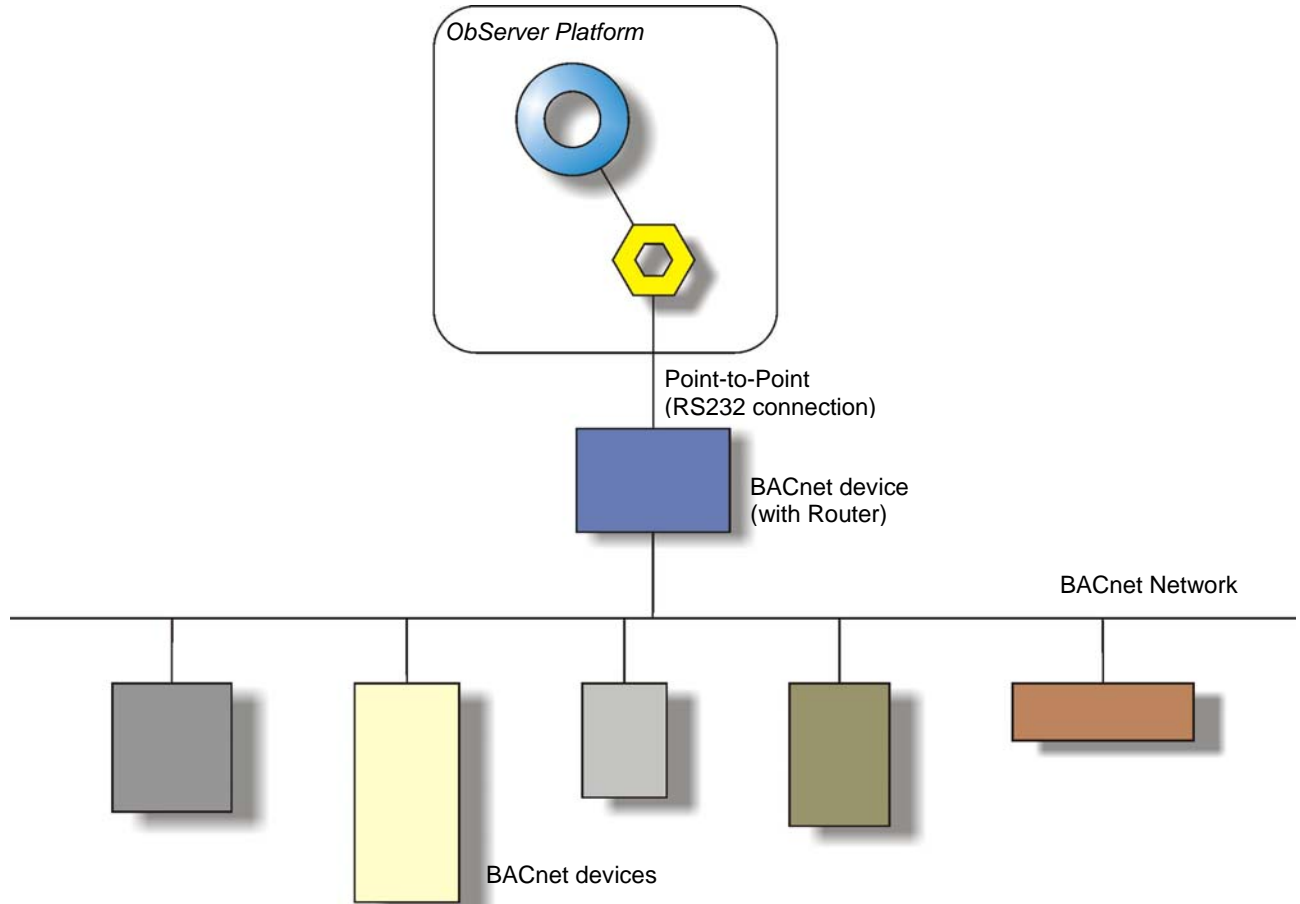
# Product Engineering Guide

## OSM v20 BACnet v12

### Introduction

The BACnet OSM links systems supporting the ASHRAE BACnet, Building Automation and Control Networks, standard to Observer. The OSM conforms to AHRAE standard 135 – 2001 and supports the Point-To-Point (PTP) RS232 data link layer.

A BACnet/IP OSM is also available. For more information refer to the [OSM v20 BACnet/IP v10 Engineering Guide](#).



### BACnet Compatibility

Manufacturers devices support the BACnet standard to various degrees of compliance. If a device claims to support the BACnet standard, further investigation is required to assess at what degree.

An engineer should start by obtaining a PIC (Protocol Implementation Conformance) statement for each BACnet device. The PIC statement for the BACnet OSM is listed at the end of this document.

#### The Data Link Layer

The BACnet standard can operate on several link layers including Ethernet, ARCNET, RS485, RS232, IP, and LonTalk. The OSM supports the Point-To-Point (RS232) link layer. To connect to a device not supporting the Point-To-Point layer a BACnet router will be required that does.

A BACnet router converts the standard between various link layers and is available from Alerton (BACtalk router), Automated Logic (WebPRTL), and others.

#### Other North BACnet Products

Interfaces for the ObSys and Commander products are available supporting the BACnet/IP link layer.

For information relating to the North ObSys BACnet/IP interface refer to the [OSM v20 BACnet/IP v10 Engineering Guide](#).

For information relating to the North Commander product refer to the [Introduction to Commander Networking](#).

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### **Building Blocks, Services and Objects**

BACnet Interoperability Building Blocks (BIBBs) are collections of one or more BACnet services. The services are described in terms of an 'A' and a 'B' device. Both of these devices are nodes on a BACnet inter-network. In most cases 'A' will act as the user of data (i.e. the OSM) and the 'B' device will be the provider of this data (i.e. the controller).

The OSM supports the reading and writing of objects from another BACnet device. For the OSM to communicate with a BACnet device it should support the following BIBBs:

- DS-RP-B Data Sharing – Read Property – B
- DS-WP-B Data Sharing – Write Property – B

The OSM can read and write the following standard object types, which the other BACnet device should support:

- Analog Output
- Analog Input
- Analog Value
- Binary Output
- Binary Input
- Binary Value
- Multi-State Output
- Multi-State Input
- Device

### **Further Information**

For more information on the BACnet standard visit <http://www.bacnet.org/>.

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## **Engineering**

### **Step 1 – Install OSM**

The BACnet OSM is installed automatically with all ObSys editions. Refer to the 'ObSys CD sleeve' for details on how to install ObSys.

### **Step 2 – Configure BACnet System**

When configuring the BACnet system note the network and device numbers used for all devices on the BACnet inter-network. For the device to be connected to ObServer, note the APDU timeouts.

### **Step 3 – Connect COM Port to BACnet System**

Using cable, connect the BACnet to a COM port of the PC. The cable from the COM port to the device cannot be described in this document, but must be determined by the engineer by analysing the documentation covering the equipment. The cable should be as short as possible, and not greater than 15m.

### **Step 4 – Plug in BACnet OSM to ObServer**

Use object engineering software, such as ObView, to locate the ObServer set-up object. Assign the BACnet OSM to an available channel. Refer to '[ObServer v20 Application Engineering Guide](#)' for more information.

Note: After inserting the OSM, your engineering software may need to re-scan the ObServer object in order to view the OSM.

### **Step 5 – Configure BACnet OSM**

The COM port, baud rate, BACnet address, and BACnet message timeouts are configured using objects. Use object engineering software to view and modify the module objects within the OSM.

The BACnet device and BACnet network numbers for the OSM **both** need to be unique to the BACnet inter-network. The APDU timeouts should also be set to match those of the connected BACnet device.

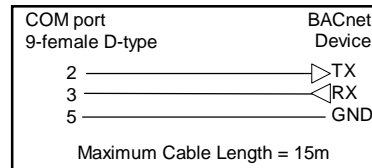
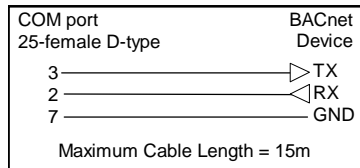
### **Step 6 – Access Objects within the BACnet System**

Values from the BACnet system are made available as objects from ObServer. Any object software that is connected to the ObServer can access these objects.

# Engineering Reference

## Cable Specification

The cable between COM port and the BACnet cannot be fully determined here. If you require assistance with the cable please contact North technical support.



## Objects

When the OSM is loaded the following objects are created within ObServer, use object software to access these objects.

Object <sup>[1]</sup>	Label	R/W	Type
Sc	BACnet System connected to channel <i>c</i>	-	[BACnet v12] <sup>[2]</sup>
Mc	BACnet Module connected to channel <i>c</i>	-	[OSM v20\BACnet v12]

### Notes

[1] The ObServer channel number, *c*, is a number in the range 1...40.

[2] This object has a variable content and as such requires scanning.

## Notes

### Revision History

Version	Build Date	Details
1.0	27/3/98	Driver released on pre-release (beta) test, awaiting BACnet vendor ID.
1.0	14/7/98	Driver released with Vendor ID
1.0	4/11/98	Updated ObView support
1.0	18/11/99	Fix: Problem with address field when accessing multiple devices.
1.0	18/8/00	Mod: Implement changes in 135-1995 addendum b
1.1	5/11/02	Mod: Implement relevant changes in 135-2000. Add driver objects SS and SE to ease scanning of large device instance numbers.
1.2	1/08/06	Mod: Add support for multi-state input/outputs BACnet objects Mod: Can now access MS/TP devices by MAC address. Mod: Now support password in connected router.

# BACnet Protocol Implementation Conformance Statement

<b>Date</b>	August 1, 2006			
<b>Vendor Name</b>	North Building Technologies Ltd.			
<b>Product Name</b>	ObSys			
<b>Product Model Number</b>	OSM BACnet Module			
<b>Applications Software Version</b>	BACnet v1.2 01/08/2006	<b>Firmware Revision</b>	OSM v1.0	<b>BACnet Protocol Revision</b> 1

## Product Description

The OSM BACnet module provides a gateway between the North Building Technologies eXtensible Object Model (XOM) and BACnet devices via ObSys.

ObSys comprises of a set of modular software applications that are used to communicate with, display information from, and engineer solutions for integrated building management systems.

## BACnet Standardized Device Profile (Annex L)

The OSM does not currently conform to any of these standardized profiles.

- BACnet Operator Workstation (B-OWS)
- BACnet Building Controller (B-BC)
- BACnet Advanced Application Controller (B-AAC)
- BACnet Application Specific Controller (B-ASC)
- BACnet Smart Sensor (B-SS)
- BACnet Smart Actuator (B-SA)

## BACnet Interoperability Building Blocks Supported (Annex K)

BACnet Interoperability Building Blocks (BIBBs) are collections of one or more BACnet services. The services are described in terms of an 'A' and a 'B' device. Both of these devices are nodes on a BACnet inter-network. In most cases 'A' will act as the user of data (like a BAS Server) and the 'B' device will be the provider of this data (like a field control module or router).

BIBB Type		BACnet Service	Initiate	Execute
DS-RP-A	Data Sharing - Read Property - A	ReadProperty	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DS-RP-B	Data Sharing - Read Property - B	ReadProperty	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DS-WP-A	Data Sharing - Write Property - A	WriteProperty	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-DDB-A	Device Management - Dynamic Device Binding - A	Who-Is	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		I-Am	<input type="checkbox"/>	<input checked="" type="checkbox"/>
DM-DDB-B	Device Management - Dynamic Device Binding - B	Who-Is	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		I-Am	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-TS-A	Device Management - Time Synchronization - A	TimeSynchronization	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DM-RD-A	Device Management - ReinitializeDevice - A	ReinitializeDevice	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NM-CE-A	Network Management - Connection Establishment - A	Establish-Connection-To-Network	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		Disconnect-Connection-To-Network	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NM-CE-B	Network Management - Connection Establishment - B	Establish-Connection-To-Network	<input type="checkbox"/>	<input checked="" type="checkbox"/>
		Disconnect-Connection-To-Network	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## Segmentation Capability

- Segmented requests supported      Window Size: 2
- Segmented responses supported      Window Size: 2

## Standard Object Types Supported

Object Type	Dynamically Creatable	Dynamically Deletable	Optional Properties Supported	Writable Properties Supported
Device	<input type="checkbox"/>	<input type="checkbox"/>		

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### Data Link Layer Options

- BACnet IP, (Annex J)
- BACnet IP, (Annex J), Foreign Device
- ISO 8802-3, Ethernet (Clause 7)
- ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
- ANSI/ATA 878.1, RS-485 ARCNET (Clause 8)
- MS/TP master (Clause 9)
- MS/TP slave (Clause 9)
- Point-To-Point, EIA 232 (Clause 10), baud rates: 9600-38400
- Point-To-Point, modem, (Clause 10)
- LonTalk, (Clause 11)

### Device Address Binding

Is static device binding supported?       Yes     No  
(Necessary for two-way communication with MS/TP slaves and certain other devices.)

### Networking Options

- Router, Clause 6
- Annex H, BACnet Tunneling Router over IP
- BACnet/IP Broadcast Management Device (BBMD)

### Character Sets Supported

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

- ANSI X3.4
- IBM™/Microsoft™ DBCS
- ISO 8859-1
- ISO 10646 (UCS-2)
- ISO 10646 (UCS-4)
- JIS C 6226

### If this product is a communication gateway, describe the types of non-BACnet equipment/network(s) that the gateway supports:

As part of North's modular product range, this OSM allows values from the BACnet inter-network to be shared with the various systems supported.

The latest interface list is available from [www.northbt.com/interface](http://www.northbt.com/interface).

### BACnet Conformance Class Supported

Note that BACnet devices are no longer described using conformance classes. This section is provided solely for historical reasons.

Class 1 <input checked="" type="checkbox"/>	Class 4 <input type="checkbox"/>
Class 2 <input type="checkbox"/>	Class 5 <input type="checkbox"/>
Class 3 <input type="checkbox"/>	Class 6 <input type="checkbox"/>

### BACnet Functional Groups Supported

Note that BACnet devices are no longer described using functional groups. This section is provided solely for historical reasons.

Clock	<input type="checkbox"/>	Files	<input type="checkbox"/>
HHWS	<input checked="" type="checkbox"/>	Reinitialize	<input type="checkbox"/>
PCWS	<input type="checkbox"/>	Virtual Operator Interface	<input type="checkbox"/>
Event Initiation	<input type="checkbox"/>	Virtual Terminal	<input type="checkbox"/>
Event Response	<input type="checkbox"/>	Device Communication	<input type="checkbox"/>
COV Event Initiation	<input type="checkbox"/>	Time Master	<input type="checkbox"/>
COV Event Response	<input type="checkbox"/>		