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INDUSTRIAL CONTROL COMMUNICATIONS, INC.

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# BACnet/IP BBMD Driver Manual

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# 1 BACnet/IP BBMD

## 1.1 Overview

This driver supports BBMD (BACnet/IP broadcast management device) functionality, which is required in some capacity when a BACnet/IP network spans over several subnets separated by IP routers. Some notes of interest are:

- Supports up to 32 Broadcast Distribution Table (BDT) entries
- Supports up to 32 Foreign Device Table (FDT) entries
- Supports BBMD operation behind NAT IP routers.
- Does not register as a foreign device
- Whenever a node is added to the project, its BACnet device object is always present and must be properly configured.
- Whenever a node is added to the project, its “My BDT Entry” is always present and must be properly configured.

## 1.2 Supported BBMD Services

This section details the BBMD services that are supported by the driver.

### **Write Broadcast Distribution Table**

The driver processes *Write Broadcast Distribution Table* messages to initialize or update its BDT.

### **Read Broadcast Distribution Table**

The driver responds to *Read Broadcast Distribution Table* messages with a *Read Broadcast Distribution Table Ack* message that contains the current contents of its BDT.

### **Forwarded NPDU**

The driver processes incoming and outgoing *Forwarded NPDU* messages.

### **Register Foreign Device**

The driver responds to *Register Foreign Device* messages with a *Register Foreign Device Ack* message and updates its FDT.

### **Read Foreign Device Table**

The driver responds to *Read Foreign Device Table* messages with a *Read Foreign Device Table Ack* message that contains the current contents of its FDT.

### **Delete Foreign Device Table Entry**

The driver processes *Delete Foreign Device Table Entry* messages and updates its FDT.



## **Distribute Broadcast To Network**

The driver processes *Distribute Broadcast To Network* messages from registered foreign devices.

### **1.3 Protocol Settings**

#### **UDP Port**

Specifies the UDP port that the driver will use for BACnet communications. Enter a value between 1...65535 (0x0...0xFFFF).

### **1.4 Node Settings**

There are no node settings. A node is simply a container for Broadcast Distribution Table (BDT) entries.

### **1.5 Device Object Settings**

A Device Object is automatically added to every node, and cannot be removed. The Device Object contains several configurable fields that must be appropriately set for each device residing on a BACnet network.

The BACnet/IP BBMD driver, BACnet/IP client driver and BACnet/IP server driver all include mandatory device object definitions. When more than one of these drivers is executing on a single device, only one of these device object definitions is used as the overall device object instance. The hierarchy used to determine which device object definition is used in a multiple-driver scenario is as follows:

1. BACnet/IP client driver device object (highest priority)
2. BACnet/IP server driver device object
3. BACnet/IP BBMD driver device object (lowest priority)

#### **Device Name**

Defines the node's name. The device name must be unique across the entire BACnet network. Enter a string of between 1 and 32 characters in length.

#### **Instance Number**

Defines the node's instance number. The instance number must be unique across the entire BACnet network. Enter a value between 0...4194302 (0x0...0x3FFFFE).

### **1.6 Broadcast Distribution Table**

Each IP subnet that is part of a BACnet/IP network comprised of two or more subnets shall have at least one BBMD. Each BBMD shall possess a table called a Broadcast Distribution Table



(BDT). If there are two or more BBMDs on a single subnet, their BDTs shall not contain any common entries in order to avoid a broadcast forwarding loop.

The BDT determines which remote IP subnets receive forwarded BACnet broadcasts. The BDT consists of one entry for the address of the BBMD for the local IP subnet and an entry for the BBMD on each remote IP subnet to which broadcasts are to be forwarded. If the IP router to the subnet performs network address translation (NAT), then the BDT entry shall contain the global IP address of the IP router.

### **1.6.1 My BDT Entry Settings**

Defines a Broadcast Distribution Table (BDT) entry for the BBMD itself.

#### **IP Address**

The IP address used to access this device from remote networks.

#### **Port**

The UDP port on which this device receives BACnet/IP packets from remote networks. The default value is 47808 (0xBAC0). To ensure successful communications, use caution when using a port setting other than the default value.

#### **Distribution Mask**

The default value is 255.255.255.255, also known as the 2-hop method. This ensures that packets can be successfully forwarded to the target BBMD, which in turn will broadcast the packet on its own local subnet. If it is necessary to change the default value, be sure to first check the capabilities of the router as not all routers support forwarding directed broadcasts.

### **1.6.2 BDT Entry Settings**

Defines a Broadcast Distribution Table (BDT) entry which targets a BBMD on a remote network.

#### **IP Address**

The IP address used to access the remote BBMD.

#### **Port**

The UDP port on which the remote BBMD receives BACnet/IP packets. The default value is 47808 (0xBAC0). To ensure successful communications, use caution when using a port setting other than the default value.

#### **Distribution Mask**

The default value is 255.255.255.255, also known as the 2-hop method. This ensures that packets can be successfully forwarded to the target BBMD, which in turn will broadcast the packet on its own local subnet. If it is necessary to change the default value, be sure to first check the capabilities of the router as not all routers support forwarding directed broadcasts.



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