BACnet BBMD Data Sheet

LM Gateway101- BBMD

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1. Introdction

1.1 What Is BACnet BBMD?

BACnet/IP uses UDP/IP compatibility with existing IP infrastructure. When BACnet/IP is used with multiple IP subnets, then special additional device functionality called BACnet Broadcast Management Device are required to manage inter-subnet BACnet broadcast messages.

Routers join IP networks together so that messages from one network can be sent to another. Most IP routers do not forward broadcast messages and this means discovery can't discover devices on another network. To solve this problem, BACnet provides a technology called BBMD - BACnet/IP Broadcast Management Device.

1.2 BBMD Topology

Overall, the technology is simple. You install a BBMD (Note : there is only one BBMD on each subnet) on each network. If you have more than one BBMD on a network it will cause a broadcast storm. You can configure the BBMD by specifying the IP Address and mask of the each BBMD. This makes both BBMD configures identical. When the one BBM receives a broadcast, it forwards the messages to the other BBMD, which in turn re-broadcasts on the other network. They are configured by BDT files and these may be modified on the fly using select BACnet services.

The technology also provides for foreign device registration. This allows a device on one network to communicate with a device on another network by using the BBMD to forward and route the messages.
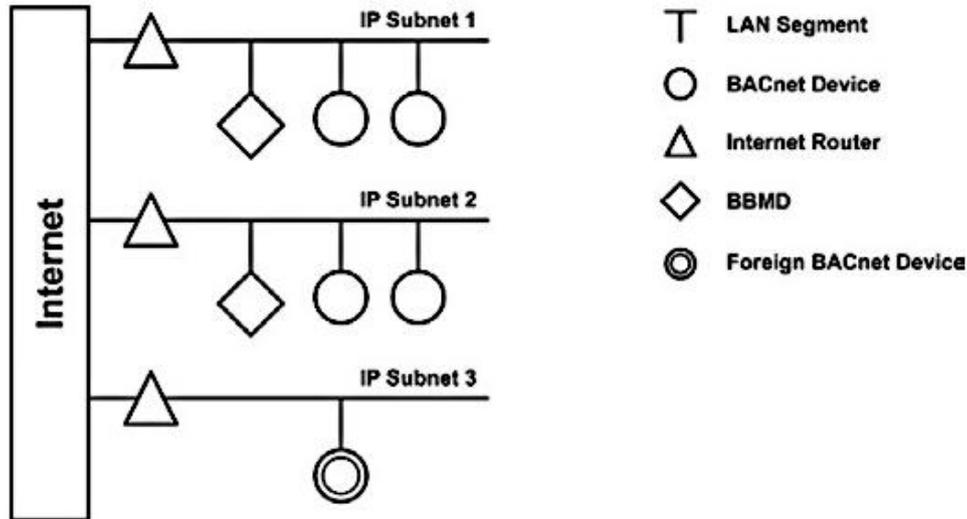
A foreign device and two BBMD Devices Network topology

1.3 BDT And FDT

This driver supports 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. Supports up to 128 Broadcast Distribution Table(BDT)entries and 128 Foreign Device Table(FDT)entries.

Each BBMD has a list of all other BBMDs on other networks in its broadcast distribution table(BDT). They act as co-conspirators, getting around the broadcast blockade by smuggling the broadcasts into directly sent packages that routers allow to pass through. Finally, when a BBMD gets a smuggled package, it broadcasts it locally.

When a BBMD receives the broadcast message it encapsulates it and sends it a direct message to every other BBMD in its Broadcast Distribution Table (BDT). These other BBMDs open up the package and rebroadcast the contents locally, permitting BACnet broadcast traffic to permeate the entire network.

It is possible to communicate to a device on a subnet that does not have a BBMD, this type of device is called a foreign device since it resides on a different IP subnet from devices attempting to communicate with it. Usually a foreign device is on a different subnet. If the foreign device registers with the BBMD, it can be seen and able to communicate with all other devices on the network. The BBMD must then maintain a Foreign Device Table (FDT).

1.4 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 message to initialize its BDT.

■ Read Broadcast Distribution Table

The driver responds to Read Broadcast Distribution Table 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 message 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.

2. Before Configuration

2.1 Preparing network/BBMD device

Make sure that you properly configure your BBMD device before connecting it to a BACnet network.

First, you need to establish a connection between a PC and the BBMD's configuration port. We recommend that you connect both the PC and the BBMD to an Ethernet hub or switch, as shown in the figure below. You will need two standard Ethernet cables (NOT crossover cables).

The BBMD Ethernet port has a default fixed IP address – 192.168.1.230.

The PC's Ethernet port must be set to not use DHCP. you can configure it for the IP address 192.168.1.10. The Subnet mask field also needs to be set: 255.255.255.0.

192.168.1.10
255.255.255.0

192.168.1.230
255.255.255.0

2.2 Reset default IP

By default, the IP of BBMD is 192.168.1.230, DHCP server is disabled. To reset to default IP, A paperclip is needed to press reset button for more than 3 seconds and the release. The router will restore IP to the default 192.168.1.230, but reboot will lost it.

Reset IP

2.3 Access Web UI

Plug your PC and the BBMD into the same Ethernet hub or switch. On the PC, open a web browser and type the IP address of the BBMD: http://192.168.1.230.

The BBMD must have completed the start-up phase (check that the Power LED in front is steady green and three beeps are heard); otherwise the web pages will not be sent to the PC.
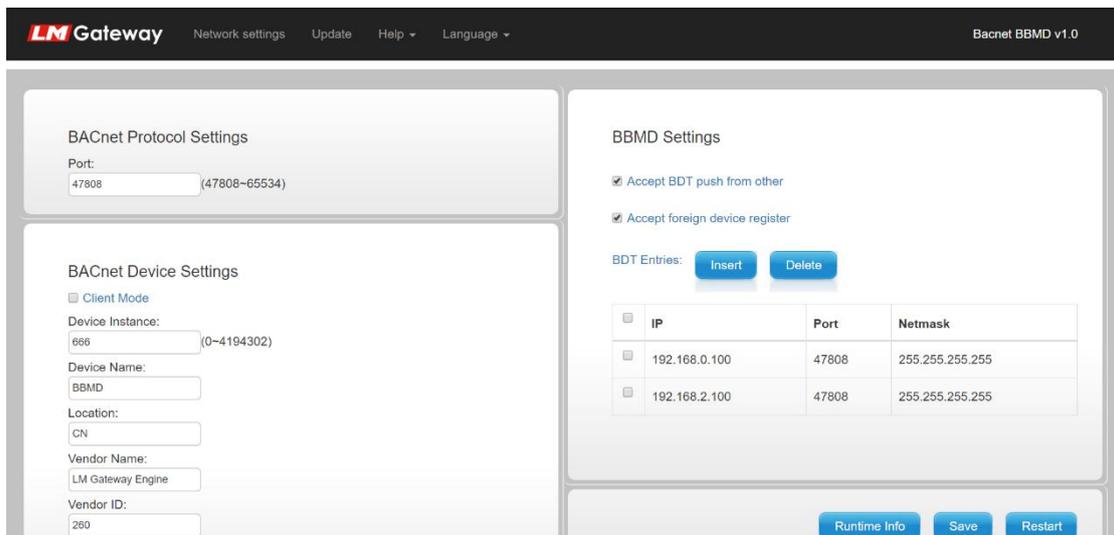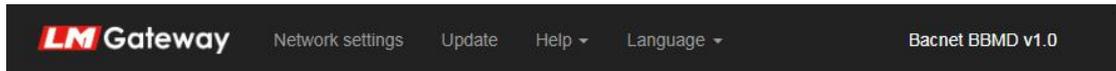

2.4 Status LED

When the BBMD is running without problem, the status LED is flashing every 3 seconds.

3. General Settings

We can use Web UI's menu to configure network settings, upgrade firmware, view help document, switch language between Chinese and English, also the

firmware version can be seen on the right side.

3.1 Network Settings

The BBMD device have one network interface, so you can configure the interface IP address.

3.2 Upgrade firmware

Firmware will be upgrade by selecting [Update] on web menu, giving a firmware file, clicking [Upload]. Upgrade will take about one or two minutes, web pages need reloaded. New version number will be shown on the right menu.
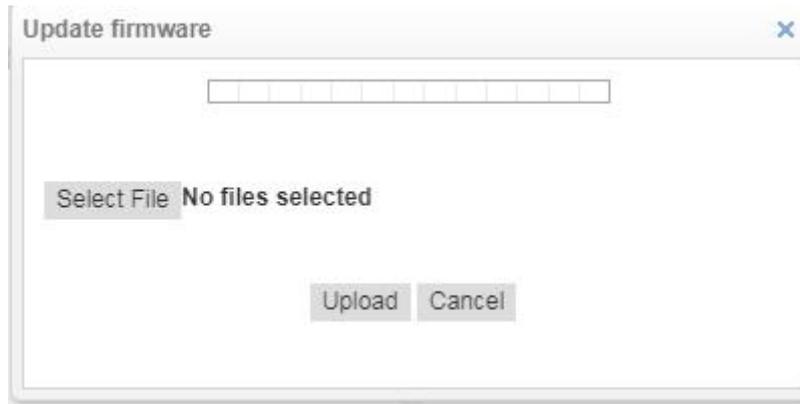
3.3 Help

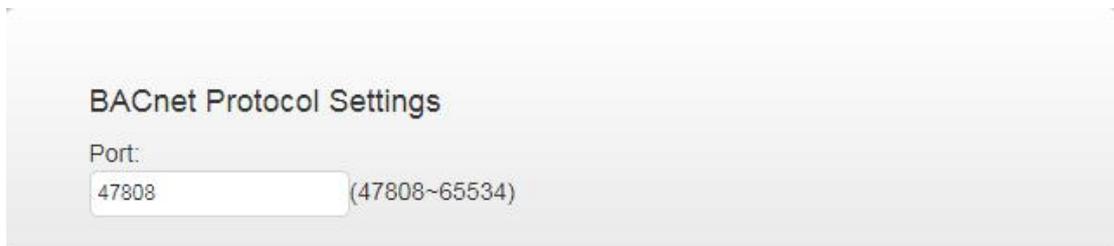If you have any question, you can view help document, also you can contact us.

3.4 Switch Language

Web UI support English version and Chinese version, you can switch language between English and Chinese.

4. BBMD Configuration

4.1 Protocol Settings

This page allows you to modify BACnet communication UDP port.

UDP Port

Specifies the UDP port (default 47808) that the driver will use for BACnet communications. Enter a value between 1...65534(0x1...0xFFFE).

4.2 Device Settings

This page allows you to view/modify BACnet Device settings of the BBMD. Make sure that the Device Instance Number and Device Name are unique across the whole BACnet internetwork. Keep in mind that the BACnet standard and the BTL require that Device Discovery be turned on.

BACnet Device Settings

☐ Client Mode

Device Instance:

666   (0~4194302)

Device Name:

BBMD

Location:

CN

Vendor Name:

LM Gateway Engine

Vendor ID:

260

Description:

LM BACnet BBMD

■ Client Mode

If enable there is no Device object inside the BBMD, so below fields is disabled. select this checkbox to disable I-Am/I-Have message. BBMD operation is not affected by this parameter (default deselect).

■ Device Instance

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

■ Device Name

Defines the device's name. Enter a string of between 1 and 32 characters in length.

■ Location Name

Defines the device's location information. Enter a string of between 1 and 64 characters in length.

■ Vendor Name

Defines the device's vendor name. Enter a string of between 1 and 16 characters in length.

■ Vendor ID

Defines the device's vendor ID. Enter a unsigned short value between 1 and 65535.

■ Description

Defines the device's description information. Enter a string of between 1 and 64 characters in length.

4.3 BBMD Settings

This page allows to view or modify BBMD settings attached to the BACnet network.

■ Accept BDT push from other

If this parameter is enabled, the device accepts write to BDT from BBMD Client, meanwhile the Web UI refresh can show current BDT. BDT push feature will not work as expected if other BBMDs not accept BDT push.

■ Accept foreign device register

If this parameter is enabled, the device accepts registering from foreign device, meanwhile the runtime info shows current FDT.

■ 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, used caution when 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 is 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 IP router as not all routers support forwarding directed broadcasts.

4.4 Activate Configuration And Statistics

This page shows runtime information in device, allows you to save the configuration for archive purposes, and activate configuration by reboot device.

■ Runtime Info

Runtime information shows statistics for the FDT table in device, and network receive packets and send packets information about network interfaces.FDT table show each entry as: ip:port, TTL and remaining time You can also refresh statistics information by clicking on the "Refresh" button.

■ Activate Configuration

Once changes are made to any configuration on the Web UI, the changes get saved only after clicking on the "Save" button in the Configuration screen. Clicking on the "Restart" button will reboot the device,   and the changes that have been made.