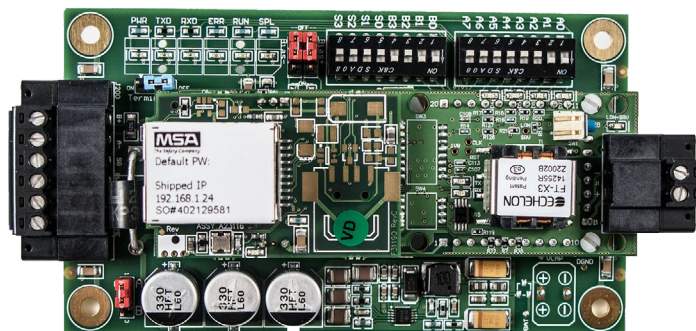# APPLICATION NOTE

APP #085
MCS-BMS-GATEWAY

A BMS GATEWAY is needed to support the following protocols; BACnet IP, Modbus IP, BACnet MS/TP, Johnson N2 and LonTalk

MCS-BMS-GATEWAY

Current model stocked with LonTalk

STEPS FOR SETTING UP A MCS-BMS-GATEWAY

- *MCS-BMS-GATEWAY* - **NOT PROGRAMMED** when shipped from factory.

  1. Refer to page 2-4 - to setup files needed for Programming the MCS-BMS-GATEWAY using MCS-CONFIG.

  2. Refer to page 5 - for setting up and programming the MCS-BMS-GATEWAY

  3. Refer to wiring diagrams - pages 6, 7 for wiring at site for the correct protocol.

- *MCS-BMS-GATEWAY-P* - **PROGRAMMED** by factory or OEM prior to shipping with all protocols.

  1. Refer to wiring diagrams - pages 5, 6 for wiring at site for the correct protocol.
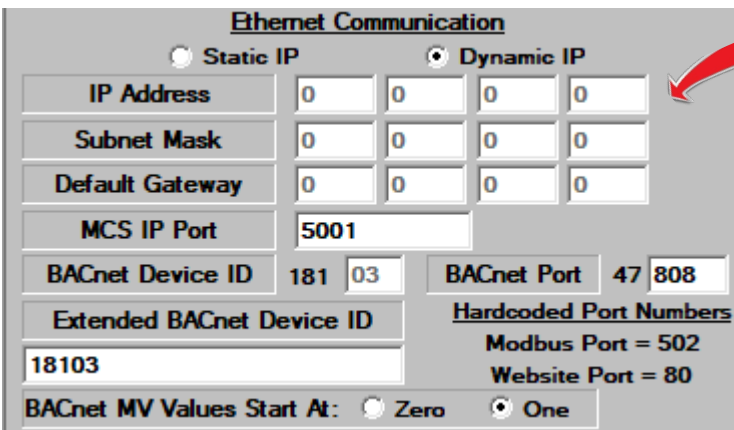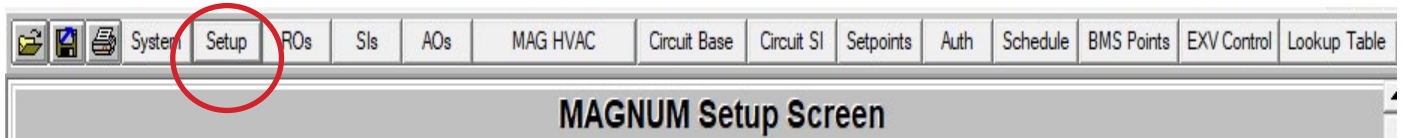
USING MCS-CONFIG

If you are licensed to use MCS-CONFIG follow the instruction below to start building a file for your MCS-BMS-GATEWAY.

MCS-Config version 18.13 or greater is required to create the csv files for Bacnet IP and Modbus IP.

CREATING CSV FILES USING MCS-CONFIG

1. Open MCS-Config program and load the config you are working on.
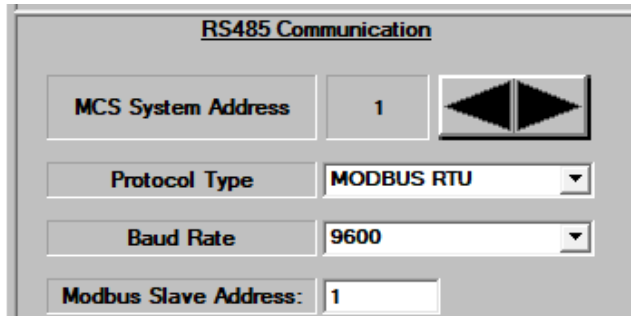
2. Click on Setup.

MAGNUM Setup Screen

Ethernet Communication

○ Static IP		● Dynamic IP		
IP Address	0	0	0	0
Subnet Mask	0	0	0	0
Default Gateway	0	0	0	0
MCS IP Port	5001			
BACnet Device ID	181 03	BACnet Port	47 808	
Extended BACnet Device ID		Hardcoded Port Numbers		
18103		Modbus Port = 502		
		Website Port = 80		
BACnet MV Values Start At:	○ Zero	● One		

NOTE:
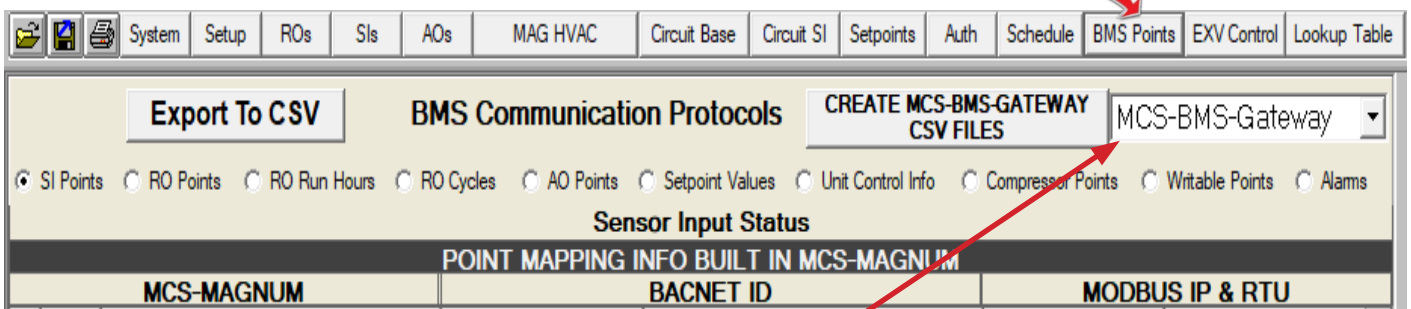The Ethernet IP, ETC settings do not need to be set when using RS485 connection.

⚠ IMPORTANT

DO NOT CHANGE BACNET DEVICE ID ONCE CSV FILES ARE CREATED!!

Set the MCS-Magnum RS485 port up for Modbus RTU, baud rate 9600 and address 1.

RS485 Communication

MCS System Address	1 ◀▶
Protocol Type	MODBUS RTU ▼
Baud Rate	9600 ▼
Modbus Slave Address:	1

3. Click on BMS-POINTS

Export To CSV   **BMS Communication Protocols**   **CREATE MCS-BMS-GATEWAY CSV FILES**   MCS-BMS-Gateway ▼

● SI Points ○ RO Points ○ RO Run Hours ○ RO Cycles ○ AO Points ○ Setpoint Values ○ Unit Control Info ○ Compressor Points ○ Writable Points ○ Alarms

Sensor Input Status

POINT MAPPING INFO BUILT IN MCS-MAGNUM

MCS-MAGNUM	BACNET ID	MODBUS IP & RTU

4. Click on drop down box on left for BMS TYPES
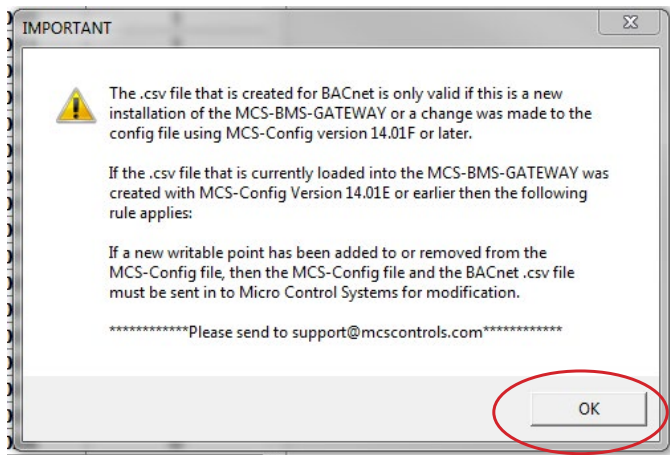
5. Choose BMS type:
   a. BMS-GATEWAY-(default - with LonTalk)
   b. BMS-GATEWAY-N54

6. Click **'CREATE MCS-BMS-GATEWAY CSV FILES'**

7. Drop down window shows Fixed BACnet ID;

   a. Default - 'DIP Switch field-selectable BACnet ID 181xx'

   b. Customer Specified BACnet ID (custom BACnet number can be added)

8. Click on 'Export to CSV

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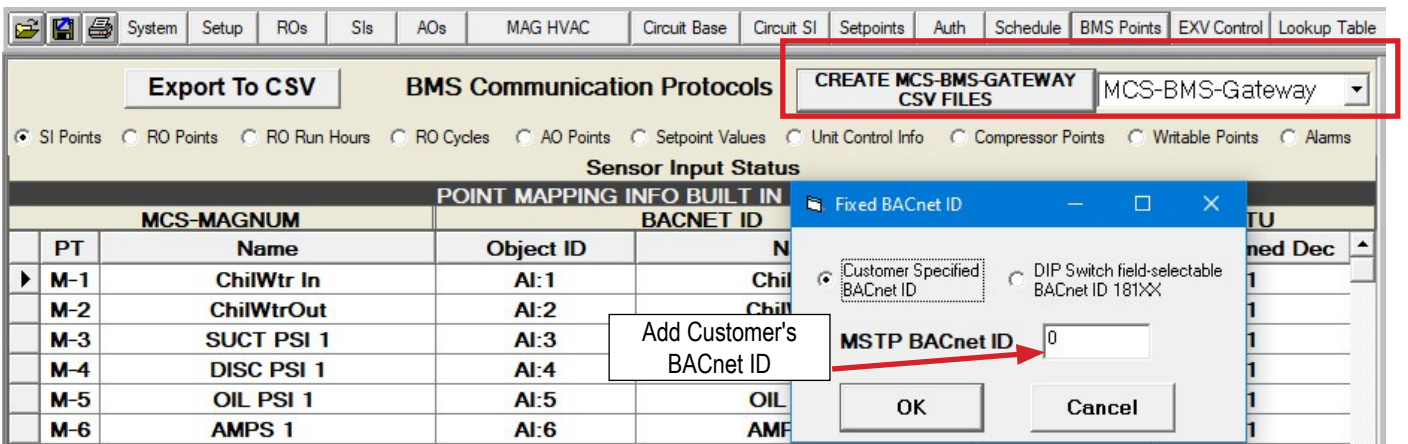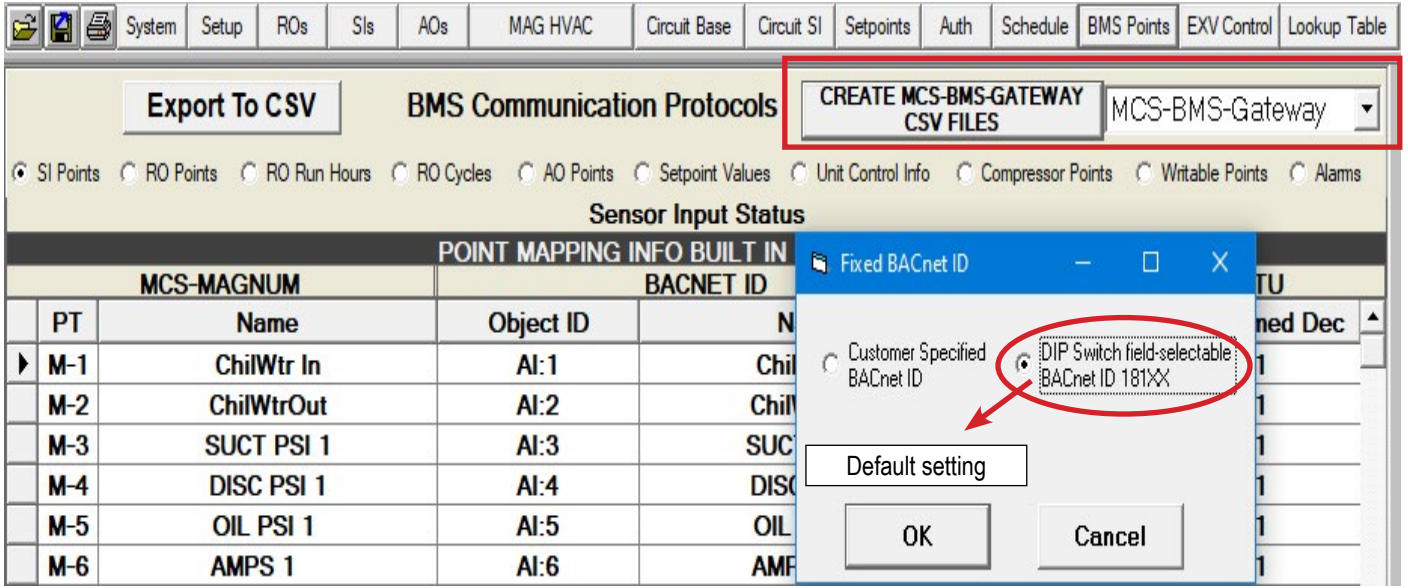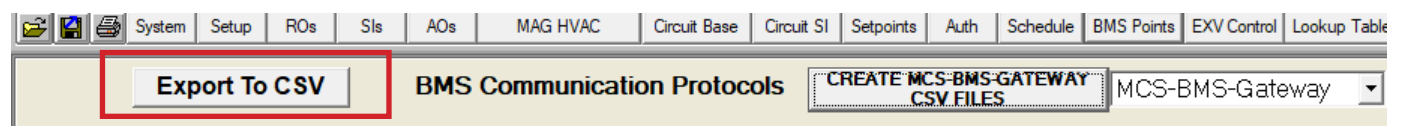
9. When popup window comes up click ok.

NOTE:
When prompted, select the file location where you want to save the csv files. This would be the time to name the CSV files, there is a 15 character maximum not including the file extension.
If you do not name the file it will default to the first 15 characters of the config name as shown below.

10. MCS-Config will create CSV file: (CONFIG.CSV) and files needed for BMS-GATEWAY.

11. Click to save files (choose where you want to save the file)
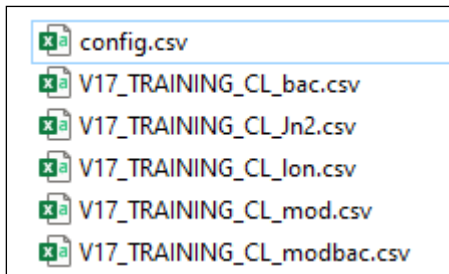
Excel or txt files saved

12. Refer to page 5- *Programming a MCS-BMS-GATEWAY*

Setting up and Programming a MCS-BMS-GATEWAY

A. *Field Server Toolbox program installed on a computer (download from mcscontrols.com).*
B. *An Ethernet Cable. (crossover cable is only required when connected from MCS-BMS Gateway to MCS-MAGNUM)*
C. *CSV files created from the MCS-MAGNUM Controller supplied by MCS or OEM / Contractor.*

1. Connect PC to a powered BMS-GATEWAY with an Ethernet Cable or crossover cable, your PC must be logged in as **administrator**.

2. Open Field Server Toolbox Program. (If running program for the first time click on **'DISCOVER NOW'**, (unclick **'Show on startup'** at bottom when closing program)**.** The MCS-BMS-GATEWAY you're connected will show up on the top line giving you the IP address and MAC address. Also you may need to right click and run as Administrator if the Gateway did not show up.

3. Look at **CONNECTIVITY column lights**,
   a. *If Blue, it is a NEW CONNECTION*
   b. *If GREEN, click Connect (shows that this is on the same network)*
   c. *If YELLOW, it is not on same network, go to 'Note at bottom of this page'*

Loading CSV file the MCS-BMS-GATEWAY

4. Click 'CONNECT'
   a. Log in using 'admin' as user name.
   b. Password is located on the label of the ethernet jack on the MCS-BMS-GATEWAY.
   c. Enter the password, select HTTP (not secure, vulnerable to man-in-the-middle attacks) unless in region of install.

4. Click **Diagnostics and Debugging.**

5. Click **Setup.**

6. Click **File Transfer**.

7. Click the **Configuration tab**, then click **Choose Files.**

8. In **Pop Up file browser**, navigate to the saved CSV files, select **Config** and click open .

9. Click **Submit.**

10. Click the **General Tab,** then **click Choose Files**

11. Select the correct BMS protocol file, than click open.
    a. bac for BacNet MS/TP
    b. jn2 for Johnson N2
    c. lon for Lontalk (not available on MCS-BMS-GATEWAY-NL or BMS-GATEWAY-N54)
    d. mod for Modbus over IP
    e. modbac for RTU to BACnet

12. Click **Submit**.

13. Click **System Restart** to reboot the BMS GATEWAY card and refresh the web browser.

14. Close the web browser and the Field Server Toolbox.

15. Reconnect the BMS GATEWAY card to the MCS MAGNUM and have the building management system discover the card.

⚠️ *Note for setting up the same network*
You need to setup your PC to the same network as the MCS-BMS Gateway.

1. Type in **'ncpa.cpl'** in the task bar search field.

2. Right click on **Local Area Connection** and left click on **Properties**.

3. Double left click on **Internet Protocol Version 4** (TCP/IP v4).

4. Select **'Use the following IP address'** and enter a static IP address on the same subnet. With the last number being different than the Gateway(192.168.18.xx)

5. Click **OK.**

6. Open **Field Server Toolbox** and click on **Discover Now**. The **Connect** button should be accessible.

WIRING BACnet IP OR MODBUS IP TO BMS OVER ETHERNET

In this configuration the MCS-BMS-GATEWAY provides Ethernet RJ45 Cat5 connection to the BMS using BACnet IP or Modbus IP.

The MCS-BMS-GATEWAY in this configuration connects to the MCS-MAGNUM RS485 port, using MODBUS RTU protocol with baud rate of 9600, Modbus slave 1.

Addressing Values

A0	1
A1	2
A2	4
A3	8
A4	16
A5	32
A6	64
A7	128

BMS 485 Address (Bacnet MSTP) See Documentation for Details.

The values of the switches in the on position are added together to determine the module's address.

MCS-BMS-Gateway	MCS-BMS-Gateway DIP Switches			
Profile - MCS-BMS-Gateway	S0	S1	S2	S3
Modbus TCP/IP	On	On	Off	Off
to BACnet IP	Off	Off	On	Off
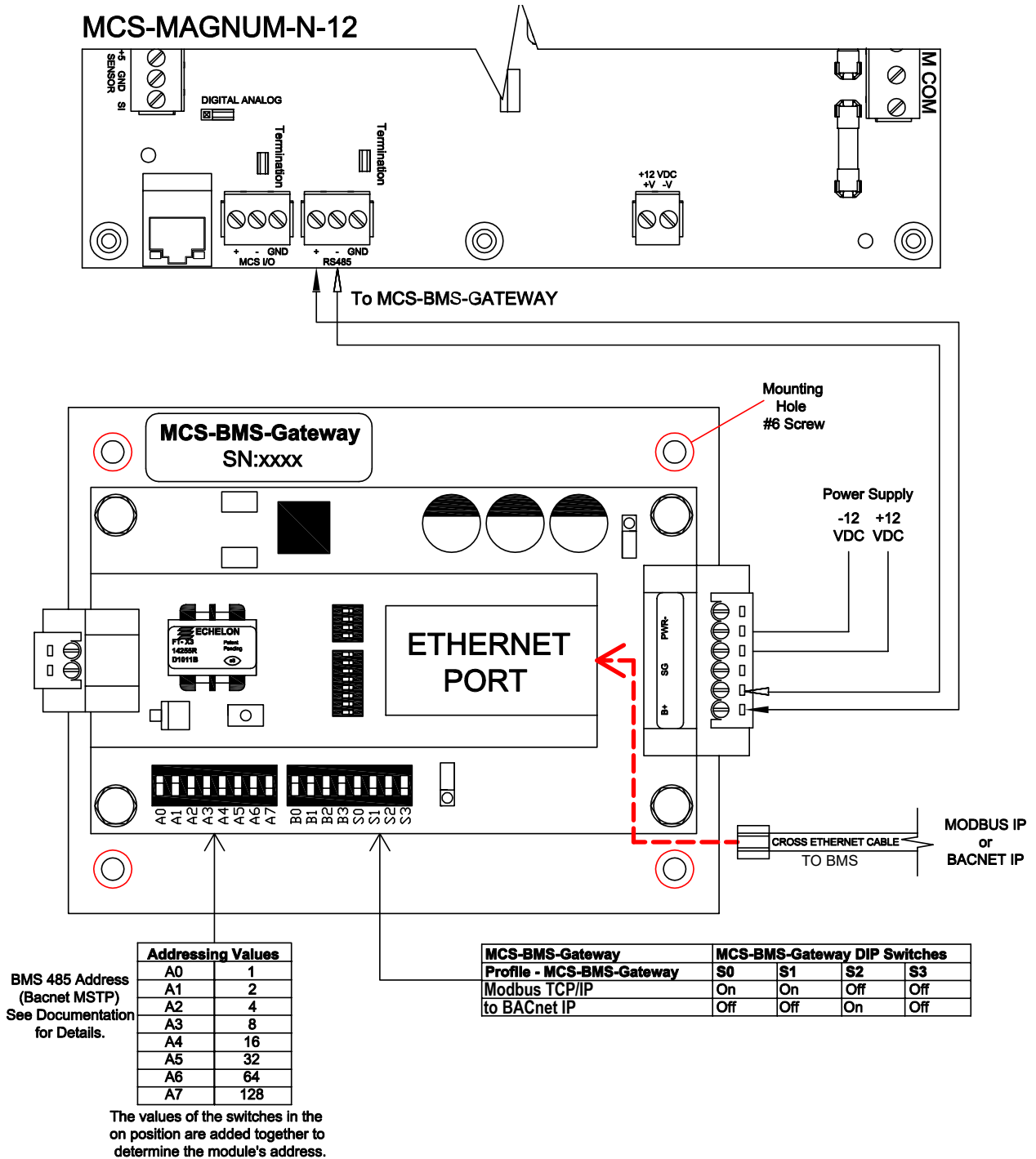
Wiring BACnet MSTP, Johnson N2, or LonTalk to BMS

In this configuration the MCS-BMS-GATEWAY provides a RS485 port for BACnet MSTP or Johnson N2 and uses the port for LonTalk as shown in the drawing below.
The MCS-BMS-GATEWAY in this configuration connects to the MCS-MAGNUM using a Ethernet RJ45 Cat5 connection talking BACnet IP.

MCS-MAGNUM-N-12

CROSSOVER CABLE

LONTALK

ETHERNET PORT

Mounting Hole #6 Screw

Power Supply
-12 VDC   +12 VDC

BACnet MSTP or Johnson N2

RS485 -
RS485 +

Addressing Values

BMS 485 Address (Bacnet MSTP) See Documentation for Details.

Addressing Values	
A0	1
A1	2
A2	4
A3	8
A4	16
A5	32
A6	64
A7	128

The values of the switches in the on position are added together to determine the module's address.

MCS-BMS-Gateway Profile - MCS-BMS-Gateway	MCS-BMS-Gateway DIP Switches			
	S0	S1	S2	S3
LonWorks	Off	Off	Off	Off
Bacnet MSTP	On	Off	Off	Off
Johnson N2	Off	On	Off	Off

Baud	B0	B1	B2	B3
Auto	Off	Off	Off	Off
9600	On	On	On	Off
19200	Off	Off	Off	On
38400	On	On	Off	On
76800	On	Off	On	On
115200	Off	On	On	On