Problem Description:
This guide is to set the connection between WebAccess and BACNet MSTP device. User has to know the module IP address and device address. Please remember to stop all other BACnet software running on your computer as they may interfere.

Brief Solution - Step by Step:

1. BACnet MSTP Configuration

1.1 BACnet MSTP

The BACnet MSTP driver is called BwBacNetM in WebAccess. This driver will allow you to connect to BACnet devices that are connected through serial ports such as Advantech, Honeywell or Alerton DDC.

The driver will allow you to connect read the data directly. All devices do not support all of BACnet functions so you should make sure your device supports a feature before trying to use it in WebAccess.

Please remember to stop all other BACnet software running on your computer as they may interfere.

1.2 Module Settings

1. Setup the BACnet IO module

   SW1 and SW2 are for MAC address setup and SW3 is for baud rate setup.

   1_0_0_0_0_0_0_0_0_0_0_1
   1_0_0_0 9600
2. BACnet IO module can be detected by running Advantech – domain Focused Configuration Tool. User has to setup proper Port and baud rate in BACnet MS/TP.
3. Advantech Domain Focused Configuration Tool should be auto-detected the BAS BACnet module.

4. User has to setup proper Device Instance and Max Master Parameter. WebAccess and BACnet BAS module shouldn't have the same Device Instance number.
The SW1 and SW2 in BAS-3024 is to define its MAC.

The one on the right most is for setup Device Instance. Device Instance must be the unique number. Suggest to set device instance as small as possible so it will save configuration tool scan time. Normally, we suggest the device instance for PC is 1.

5. User is able to setup DI, DO, UI and AO RangeCode. User also has to click “Apply” button for each channel setup.
2. WebAccess Configuration

2.1 Port

The ADAM4K protocol uses a serial port. Even if you use a serial port server or a USB to serial converter the apparent port in your computer (and therefore the port to select in WebAccess) is a serial port.

2.1.1 Check the port number

If you are using a comport emulator and you do not know the port number then open the “Start Menu” and right click on “Computer” and select “Manage”
In the device manager section you can see the list of COM ports on your computer and recognize the virtual port by its driver name.

*Picture9: Ports in Manage*
2.1.2 WebAccess Comport Page

Open your WebAccess Configuration and select the SCADA node you want to add the device to. Then select “Add a new Comport”

All the settings in this page must match the settings in all the modules attached to the port. So all the modules attached to the same comport must have the same settings.

![Update Comport](image)

**Picture10:** WebAccess Device Configuration

2.1.3 Comport Number

The Serial Comport requires the comport number to match that of the physical interface (e.g. COM1, COM2, COM3, etc) on the SCADA Node.

2.1.4 Description

This is an optional field used for user reference.

2.1.5 Baud Rate

For the BACnet MSTP modules the typical baud rate is 9600.

This must match the baud rate configured in the module and the eventual RS-485 to RS-232 converter.
2.1.6 Data Bits

The packets can have 7 or 8 Data Bits. The typical setting for BACnet MSTP is 8 bits.

2.1.7 Stop Bits

The packets can have 1 or 2 Stop Bits. The typical setting for BACnet MSTP is 1 Stop bit.

2.1.8 Parity

The Parity can be None, Odd, Even or Disabled. The typical setting for BACnet MSTP is Parity = None.

2.1.9 Scan Time

This is the time in milliseconds to scan the Devices. This must match the ability of the device to respond. A typical scan rate is 1 per second.

If the Device cannot respond as fast as the SCAN Time entered, WebAccess will scan at a slower rate.

2.1.10 Timeout

With a 1 second scan rate, a typical Time Out = 200 Milliseconds.

Timeout is the time waited before re-sending a communications packet that did not have a reply.

Timeout specifies how long the software waits for a response to a data request, specifically to wait for a reply from one packet. A recommended value is one-fifth the scan rate, longer if the communication device is slow.

Combined with Retry count, Timeout also determines time to consider a device or port as BAD. Timeout is the time to wait since last communication packet sent without a reply. Time is in milliseconds. Slow or poor quality communications require longer timeout. The faster the communications, the shorter the timeout required. Shorter timeouts result in faster reconnections after communication failures.

2.1.11 Retry Count

A typical Retry count = 3.

Number of times to retry communications if no reply is received from a device. Combined with Timeout, also determines time to consider a device or port as BAD.

This is the number of times after the first attempt has failed that communication should be attempted before indicating a failure. (If Retry count is 3, a total of 4 failed requests have occurred before tags are marked bad). Specifically, this is how many times to send a single packet after the field device fails to respond to the first packet. After the retry count is exceeded, all the tags in the packet are marked with asterisks and the next packet of requests is sent. A reasonable value is 3 to 5 times. After this number of tries, the tags in this packet are marked as
"fail to respond" (i.e. asterisks) and are disabled. In reality, increasing the number of retries hides failures on the part of the field device to respond to a request. Essentially, increasing the retries gives the field device more chances to reply.

2.1.12 Auto Recover Time

A typical Auto Recover Time = 60 Seconds.

Auto Recover Time is the time to wait before attempting to re-establish communications with a BAD device or port.

If communications to the PLC is unusually slow due to hardware, communications or network issues, you might consider increasing this value. If communications to the PLC or RTU fails frequently, you may want to decrease this number in order to have WebAccess try to re-establish communications sooner.

If communications to the PLC, RTU or device Fails (i.e. exceeds Timeout) WebAccess will wait the Auto Recover Time before trying to re-establish communications.

2.1.13 Hand Shake RTS

The typical setting for BACnet MSTP is HandShakeRts = No.

The RTS (Request To Send) signal is raised and lowered on the Serial Communications Port if this value set to Yes. RTS is determined by settings in the field device. Refer to your device interface manual to determine the value for this field and the type of cable used.

2.1.14 Hand Shake DTR

The typical setting for BACnet MSTP is HandShakeDtr = No.

The DTR (Data Terminal Ready) signal raised and lowered on the Serial Communications Port if this value is set to Yes. DTR is determined by settings in the field device and the type of cable used.

2.1.15 Backup Port

The Backup Port has not been tested for BACnet MSTP.

2.2 Device

Then Go to the port page and select “Add a new device”. Select the BwBacNetM device Type.
2.2.1 Unit Number

The Unit number is not important for MSTP communication as it is replaced by the Device Instance. Just select any available unit number.

2.2.2 This Station

This field will contain the MSTP settings for the WebAccess module in the MSTP network. The device ID and MAC must be between 1 and 255 and different from all other modules in the MSTP network.

The Maximum Master Mac parameter is very important for the network to work properly. It must correspond to the biggest Mac address in the MSTP network. Since all the modules are usually masters when they receive the token they will try to pass it to the next master. They will search all Mac addresses bigger than them until the Maximum Master ID. This means that for all none existing modules you will have to wait the timeout before sending a message again. If the Mac addresses are not set properly the communication will be extremely slow.

Please set the Mac addresses to following numbers starting with 1 and set the Maximum Master Mac properly in all modules.

Usually leave the Padding Number to 0.

2.2.3 Device Instance

If you are connecting to a BACnet IP device this value corresponds to the module identifiers in BACnet protocol, use the number that you set in the module during the configuration. It does not necessarily correspond to the Mac address but we recommend the two values to match.

2.3 Block

There are no predefined blocks in BwBacNetJ protocol. You can define blocks depending on your system and devices.
2.4 Tag

You can add the parameters using “Add tag”.

![Create New Tag](image)

**Picture12**: WebAccess Tag Configuration

2.4.1 Parameter

The parameter gives the type of tag you want to import. Try to select a parameter as close to the tag type as possible because it will fill the other option with the default parameters.

2.4.2 Address

For BACnet the first number corresponds to the data type, it will be filled properly when the parameter type is selected. The second number corresponds to the instance number, the name of the I/O. The last parameter corresponds to the parameter of the I/O, 85 corresponds to the value.

2.4.3 Scaling Type

If the data sent by the module is not in a human readable unit you can use the scaling to change the unit and display a more convenient unit in the node. In most cases a linear scaling type will be sufficient.

2.5 Supported Block List

There are no predefined block in BwBacNetJ driver.
## 2.6 Main Parameter List

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI</td>
<td>Analog Input</td>
<td>0.0.85</td>
</tr>
<tr>
<td>AO</td>
<td>Analog Output</td>
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<tr>
<td>AV</td>
<td>Analog Value</td>
<td>2.0.85</td>
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<tr>
<td>BI</td>
<td>Binary Input</td>
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<td>BO</td>
<td>Binary Output</td>
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<tr>
<td>BV</td>
<td>Binary Value</td>
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<td>MO</td>
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<td>MV</td>
<td>Multi-State Value</td>
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</tr>
</tbody>
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- **Reference:**
  N/A