BACNet Support
Branch Feeder Monitor
BFM136, BFMII

BACNet Communications Protocol

User Guide

BG0644 Rev. A1

Every effort has been made to ensure that the material herein is complete and accurate. However, the manufacturer is not responsible for any mistakes in printing or faulty instructions contained in this book. Notification of any errors or misprints will be received with appreciation.

For further information regarding a particular installation, operation or maintenance of equipment, contact the manufacturer or your local representative or distributor.

REVISION HISTORY

A0	Dec 2021	First edition
A1	Jan 2022	Published

Table of Contents

1 Background

BACNet is a standard protocol for handling access to vendor specific devices. The BN protocol defines the behavior expected from controlling station and controlled devices. It is the responsibility of the controlling station to detect devices that support BN in its network and display all information provided by each device. It is the responsibility of vendor specific devices to implement support for the BN protocol. The standard defines a wide variety of types of support for the protocol. Each vendor decides what information it wants to share via the BN protocol. All types of data are defined by the standard. The vendor, after initial detection and identification with the controlling station, must return a list of 'objects' containing device specific data that it supports. Thereafter, the controlling station can retrieve any part of the list of supported objects. Since the types of data are defined by the standard, the controlling station is expected to display them accordingly. An essential aspect of the BN protocol is the requirement that each device, in addition to providing objects with values, it must describe, the meaning of the value provided. This includes object ID, name, type, status etc.

2 SATEC Support of BN

The BN protocol defines various modes and 'profiles' for official support of standard. SATEC supports the BSA profile:

- Read
- Write
- Execute (answer) Who-Is
- Initiate I-Am

And the following types of objects:

- Analog Input (AI)
- Command r/w

This the minimum to be classified as a standard BACNet device. It is need to be detected and allow access to "Analog Input" objects per a predefined, fixed list (see exact list in following chapters).

SATEC limits support to **UDP over IP** and does not support the **routing mode** (BBMD). Since the BFM supports only one IP address, shared by all sub-meters, the BN browser will detect only one BN instance per BFM device. By default, this will be the sub-meter with address ID #1. To access other SM's, the user must set the Command object value and send to the BFM device. Thereafter, all requests for retrieval of AI objects will be directed to the corresponding SM.

3 Supported Objects

Following table shows mapping between AI objects and Modbus Point ID's:

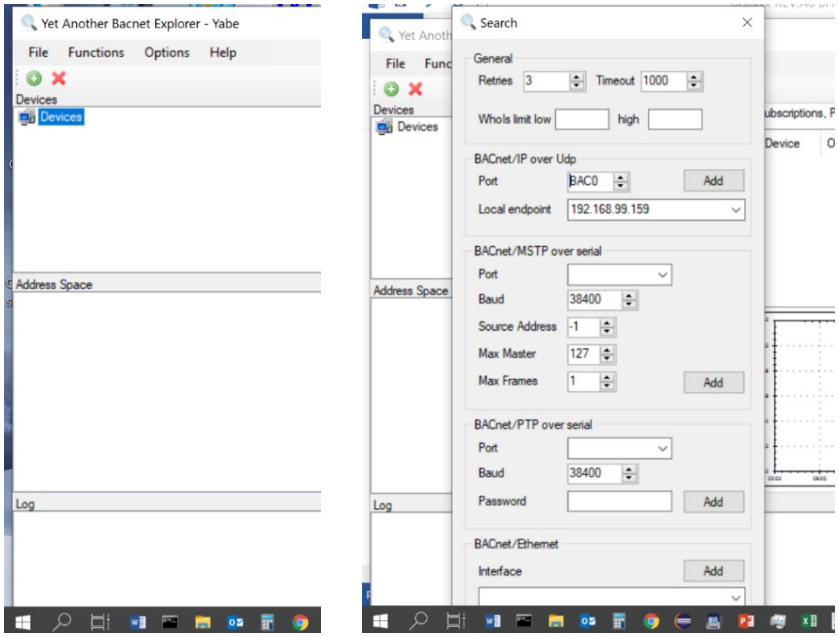
AI Object ID	Point ID	Description
1	0x1100	V1 Voltage
2	0x1101	V2 Voltage
3	0x1102	V3 Voltage
4	0x1103	I1 Current
5	0x1104	I2 Current
6	0x1105	I3 Current
7	0x1106	kW L1
8	0x1107	kW L2
9	0x1108	kW L3
10	0x1109	kvar L1
11	0x110A	kvar L2
12	0x110B	kvar L3
13	0x110C	kVA L1
14	0x110D	kVA L2
15	0x110E	kVA L3
16	0x110F	Power factor L1
17	0x1110	Power factor L2
18	0x1111	Power factor L3
19	0x111E	V12 Voltage
20	0x111F	V23 Voltage
21	0x1120	V31 Voltage
22	0x1400	Total kW
23	0x1401	Total kvar
24	0x1402	Total kVA
25	0x1403	Total PF
26	0x1404	Total PF lag
27	0x1405	Total PF lead
28	0x1406	Total kW import
29	0x1407	Total kW export
30	0x1408	Total kvar import
31	0x1409	Total kvar export
32	0x1501	In (neutral) Current
33	0x1502	Frequency
34	0x1503	Voltage unbalance
35	0x1504	Current unbalance
36	0x1600	V1 Volt demand
37	0x1601	V2 Volt demand
38	0x1602	V3 Volt demand
39	0x1603	I1 Ampere demand
40	0x1604	I2 Ampere demand

41	0x1605	I3 Ampere demand
42	0x1609	kW import sliding window demand
43	0x160A	kvar import sliding window demand
44	0x160B	kVA sliding window demand
45	0x160F	kW import accumulated demand
46	0x1610	kvar import accumulated demand
47	0x1611	kVA accumulated demand
48	0x1612	kW import predicted sliding window demand
49	0x1613	kvar import predicted sliding window demand
50	0x1614	kVA predicted sliding window demand
51	0x1618	kW export sliding window demand
52	0x1619	kvar export sliding window demand
53	0x161A	kW export accumulated demand
54	0x161B	kvar export accumulated demand
55	0x161C	kW export predicted sliding window demand
56	0x161D	kvar export predicted sliding window demand
57	0x1700	kWh import
58	0x1701	kWh export
59	0x1704	kvarh import
60	0x1705	kvarh export
61	0x1708	kVAh total

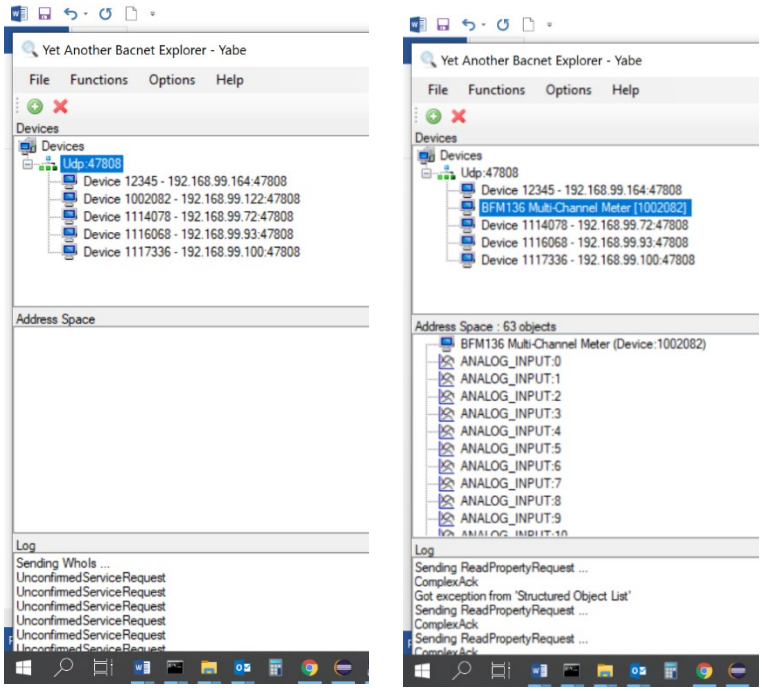
4 User Instructions

- Connect BFM device to IP network. Make sure it has a unique IP address
- Open a BACNet browser/controller. It will discover all BFM BN devices that have a unique IP address
- By default, the browser will detect the first sub-meter for each device
- All AO objects read will belong to the first sub-meter
- For each device, the BN controller can retrieve data from each and every sub-meter by configuring the Sub-Meter Selector Command Object
- For an on-going process of retrieval of AO objects from all sub-meters, the controller should apply the following logic
    - Assume 'index' that can be assigned value between 1 and 36 (54 for BFMII)
    - Start with index assigned value 1
        - Set "Present Value" of the Sub-Meter Selector to value of 'index'
        - Retrieve all AO's from the sub-meter (and store or display them)
        - Increment index by 1 (if index > 36(54), set index to 1)
        - Go to step 'i'

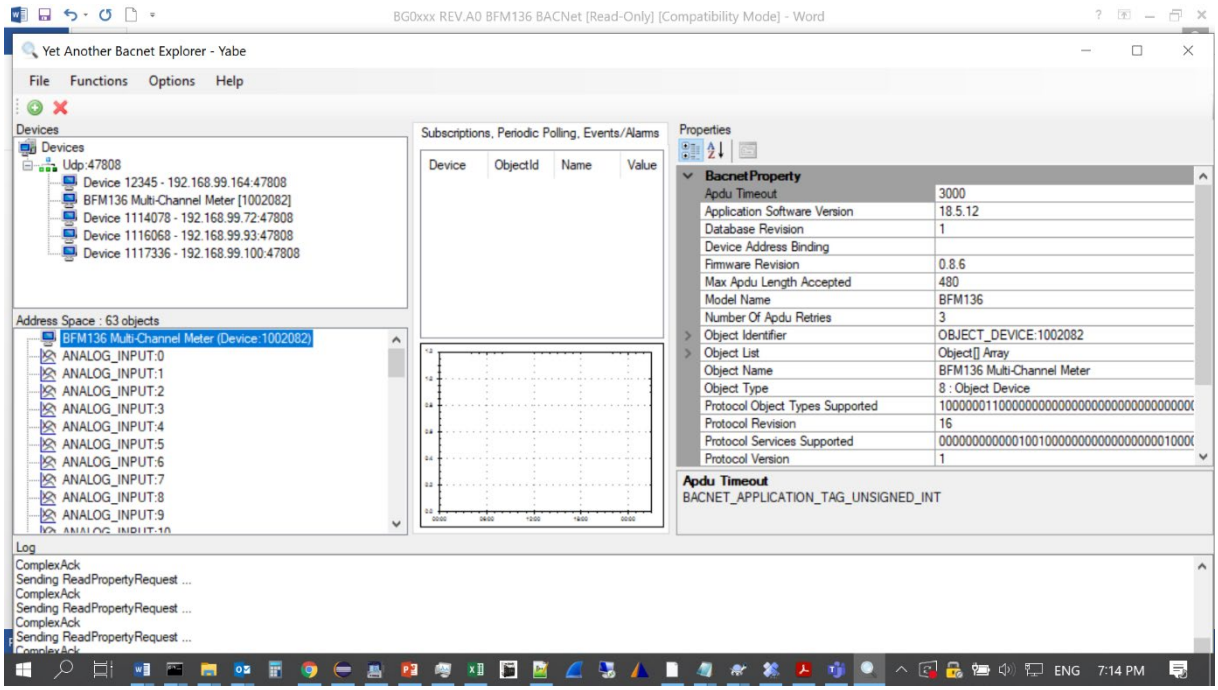
4.1 Pictures of Demonstration with Freeware BN Browser, YABE



Open browser and choose network.



YABE detects all devices supporting BN on network. Choose one and YABE will bring it's list of AI objects:



Choose the command object and change from 1 to any other ID of sub-meter defined in BFM and now all the AI objects will change accordingly.