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**MNB-1000**

**BACnet Protocol Implementation  
Conformance Statement**

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**Date:** April 21, 2008

**Vendor Name:** TAC

**Product Name:** I/A Series® MicroNet™ BACnet™ Plant Controller

**Product Model Number:** MNB-1000

**Applications Software Version:** N/A

**Firmware Revision:** 1.501

**BACnet Protocol Revision:** 4

### Product Description

The I/A Series MicroNet BACnet Plant Controller, MNB-1000, is an interoperable controller with native BACnet MS/TP communications support. The MNB-1000 features 32 I/O points: 12 universal inputs, four digital inputs, eight universal outputs, and eight digital outputs (Triacs).

The controller features Sensor Link (S-Link) support, LED status and output indication, two Ethernet ports, and screw terminal blocks. The MNB-1000's sequence of operation and BACnet image are fully programmable using WorkPlace Tech Tool, and can be applied to a wide range of mechanical equipment. Typical applications include central station air handlers, VAV air handlers, and cooling towers.

### BACnet Standardized Device Profile (Annex L)

- BACnet Operator Workstation (B-OWS)
- BACnet Building Controller (B-BC)
- BACnet Advanced Application Controllers (B-AAC)
- BACnet Application Specific Controller (B-ASC)
- BACnet Smart Sensor (B-SS)
- BACnet Smart Actuator (B-SA)

### BACnet Interoperability Building Blocks Supported (Annex K in BACnet 2004)

DS-RP-A	DS-RP-B	DS-RPM-B	DS-WP-B	DS-WPM-B	DS-COV-A
DS-COV-B	DM-DDB-B	DM-DOB-A	DM-DOB-B	DM-DCC-B	DM-UTC-B
DM-RD-B	NM-RC-B				

### Segmentation Capability

- Able to transmit segmented messages      **Window Size:** N/A
- Able to receive segmented messages      **Window Size:** N/A

## N Standard Object Types Supported

### Data Sharing Objects

Object Type <sup>a</sup>	Optional Properties	Writable Properties	Proprietary Properties				Property Range Restrictions		
			Property Name	ID	Datatype	Use	Property Name	Minimum Value	Maximum Value
Analog Input	Device_Type Reliability COV_Increment Profile_Name	Present_Value Out_Of_Service COV_Increment	Range_Minimum	801	Real	Indicate the range of Present_Value as a function of Device_Type	Present_Value	Range_Minimum	Range_Maximum
			Range_Maximum	802	Real		COV_Increment	0	16383
							All other numeric	-163.83	16383
Analog Output	Device_Type Reliability COV_Increment Profile_Name	Present_Value COV_Increment	Range_Minimum	801	Real	Indicate the range of Present_Value as a function of Device_Type	Present_Value	Range_Minimum	Range_Maximum
			Range_Maximum	802	Real		COV_Increment	0	16383
							All other numeric	-163.83	16383
Analog Value	Reliability Priority_Array <sup>b</sup> Relinquish_Default <sup>b</sup> COV_Increment <sup>c</sup> Profile_Name	Present_Value <sup>c</sup> Out_Of_Service <sup>c</sup> Relinquish_Default <sup>b</sup> COV_Increment <sup>c</sup> COV_Lifetime2 <sup>b</sup> COV_Server_Device <sup>b</sup> COV_Server_Object <sup>b</sup> COV_Server_Object <sup>b</sup> COV_Notify_Type <sup>b</sup> Proprietary_812 <sup>b</sup>	Range_Minimum	801	Real	Indicate the range of Present_Value as a function of the HVAC application	Present_Value	Range_Minimum	Range_Maximum
			Range_Maximum	802	Real		COV_Increment	0	16383
			COV_Lifetime	805	Unsigned		COV lifetime in minutes	COV_Server_Device	0
			COV_Server_Device	806	Unsigned	COV server device instance	All other numeric	-163.83	16383
			COV_Server_Object	807	BACnetObjectIdentifier	COV server object ID			
			COV_Notify_Type	808	Boolean	COV notification type			
			Proprietary_809	809	Unsigned	COV diagnostic values			
			Proprietary_810	810	Unsigned				
			Proprietary_811	811	Unsigned				
			Proprietary_812	812	Unsigned				
Binary Input	Device_Type Reliability Inactive_Text Active_Text Profile_Name	Present_Value Out_Of_Service	None				None		
Binary Output	Device_Type Reliability Inactive_Text Active_Text Profile_Name	Present_Value	None				None		
Binary Value	Reliability Inactive_Text Active_Text Profile_Name Priority_Array <sup>b</sup> Relinquish_Default <sup>b</sup>	Present_Value <sup>c</sup> Out_Of_Service <sup>c</sup> Relinquish_Default <sup>b</sup> COV_Lifetime <sup>b</sup> COV_Server_Device <sup>b</sup> COV_Server_Object <sup>b</sup> COV_Notify_Type <sup>b</sup> Proprietary_812 <sup>b</sup>	COV_Lifetime	805	Unsigned	COV lifetime in minutes	COV_Lifetime	1	2000
			COV_Server_Device	806	Unsigned	COV server device instance	COV_Server_Device	0	4194302
			COV_Server_Object	807	BACnetObjectIdentifier	COV server object ID	Proprietary_830	1	65534
			COV_Notify_Type	808	Boolean	COV notification type	Proprietary_831	1	4
			Proprietary_809	809	Unsigned	COV diagnostic values	Proprietary_832		1, 4, or 6 octets
			Proprietary_810	810	Unsigned				
Proprietary_811	811	Unsigned							
Proprietary_812	812	Unsigned							

**Data Sharing Objects (Continued)**

Object Type <sup>a</sup>	Optional Properties	Writable Properties	Proprietary Properties				Property Range Restrictions		
			Property Name	ID	Datatype	Use	Property Name	Minimum Value	Maximum Value
File	Description Record_Count	Archive Record_Count <sup>c</sup>	None				None		
Multi-state Value	Reliability State_Text Profile_Name Priority_Array <sup>b</sup> Relinquish_Default <sup>b</sup>	Present_Value <sup>c</sup> Relinquish_Default	None				None		

a. Objects are not dynamically creatable or deletable.

b. Property does not exist in all instances of the object.

c. Property is not writable in all instances of the object.

## Device Object

Object Type	Optional Properties	Writable Properties	Proprietary Properties					
			Property Name	ID	Datatype	Access	Use	Property Range Restrictions
Device	Location Max_Segments_Accepted Local_Time Local_Date UTC_Offset Daylight_Savings_Status APDU_Segment_Timeout Max_Master Max_Info_Frames Configuration_Files Active_COV_Subscriptions	Location <sup>a</sup> UTC_Offset APDU_Segment_Timeout APDU_Timeout Number_Of_APDU_Retries Max_Master Max_Info_Frames	UID_Number	900	Octet String	Read only	Device serial number	8 octets
			UID_Wink	901	Unsigned	Read/write	Flashes an LED for the number of seconds written to confirm the identity of a device.	0-255
			AutoBaud_Timeout	920	Unsigned	Read/write	Controls baud rate selection at startup.	0-10000
			Lurk_Timeout	921	Unsigned	Read/write	Used to synchronize baud rate changeover.	0-10000
			Lurk_Mode	922	Unsigned	Read/write	Used to synchronize baud rate changeover.	0-5
			AutoBaud_Enable	923	Unsigned	Read only	Indicates whether or not the device AutoBauds on startup.	
			Default_Baud_Rate	924	Unsigned	Read/write	Controls baud rate selection at startup.	0-4
			Proprietary_Object_ID	940	BACnetObjectIdentifier	Read/write	Used to set the instance number of the device object.	
			Proprietary_Object_Name	941	Character String	Read/write	Used to set the Object_Name of the device object.	20 characters max.
			Active_Baud_Rate	950	Unsigned	Read only	Active baud rate indication enumeration	0-4
			Start_Up_Delay	951	Unsigned	Read/write	Controls physical output startup delay.	0-16383
			Hide_Background_Objects	952	Unsigned	Read/write	A value of >0 disables I/O point configuration objects and removes them from the object list.	0-255
			Comm_Req_StartUp_Delay	955	Unsigned	Read/write	Controls communication startup delay.	0-1000
			AO_CAL	960	Octet string	Read only	Analog output calibration values	8 octets
			Diagnostics	999	Unsigned	Read only	I/A series diagnostics bit flags	0-65535
			DIP_Switch	1201	Unsigned	Read only	MS/TP address DIP switch setting	0-255
			Bootloader_Version	1300	Character String	Read only	Local I/O Module bootloader version string	13 characters
			Channel_Signature	1301	Octet string	Read/write	Sales channel identifier	15 octets
			MAC_0_Address	1303	Octet string	Read only	MAC address of Ethernet port 0	6 octets
			MAC_1_Address	1304	Octet string	Read only	MAC address of Ethernet port 1	6 octets
Battery_Status	1305	Unsigned	Read only	Battery status: 0-fault, 1-normal	0-1			
Comm_Channel_Enable	1308	Unsigned	Read/write	bit flags, 4 bytes 0XXXXXXXX1 = MS/TP Port Enabled 0XXXXXXXX2 = Remote I/O Port Enabled 0XXXXXX2XX = Ethernet 1 Port Enabled 0XXX1XXXX = IP Port Enabled				

Device Object (Continued)

Object Type	Optional Properties	Writable Properties	Proprietary Properties					
			Property Name	ID	Datatype	Access	Use	Property Range Restrictions
			Clear_Log_Error	1309	Unsigned	Write only	Development use only	
			MSTP_Network_Number	1310	Unsigned	Read/write	MS/TP port BACnet network number	1-65534
			Ethernet_Network_Number	1311	Unsigned	Read/write	Ethernet port BACnet network number	1-65534
			BIP_Network_Number	1312	Unsigned	Read/write	BACnet/IP port BACnet network number	1-65534
			IP_Address	1313	Octet string	Read/write	IP address	6 octets
			IP_Mask	1314	Octet string	Read/write	IP subnet mask	6 octets
			IP_Port	1315	Unsigned	Read/write	UDP port	0-65535
			IP_Gateway	1316	Octet string	Read/write	Default gateway	6 octets
			BBMD_Mode	1330	Unsigned	Read/write	Controls BBMD operation. 0 – IP node only, no BBMD or foreign device capability 1 – BBMD mode 2 – foreign device to remote BBMD	0-2
			Remote_BBMD_Addr	1331	Octet string	Read/write	Remote BBMD IP address	6 octets
			FD_Lifetime	1332	Unsigned	Read/write	Foreign device registration lifetime in seconds	1-65535
			FD_Register_Loop	1333	Unsigned	Read/write	Controls registration to a remote BBMD when BBMD_Mode is two. 0 – register once for FD_Lifetime seconds 1 – reregister automatically to keep the registration active indefinitely	0-1
			FD_Status	1334	Unsigned	Read only	Indicates status of registration to a remote BBMD. 0 – not registered 1 – registration in process 2 – registered to remote BBMD 3 – remote BBMD unreachable 4 – MNB-1000 not configured as a foreign device	0-4
			FD_Register_Command	1335	Unsigned	Write only	Writing a value of 253 (0xFD) to this property when BBMD_Mode is two commands the MNB-1000 to initiate a foreign device registration to a remote BBMD.	
			BDT	1336	Octet string	Read/write	Exposes the BACnet/IP broadcast distribution table as an octet string.	
			FDT	1337	Octet string	Read/write	Exposes the BACnet/IP foreign device table as an octet string.	

Device Object (Continued)

Object Type	Optional Properties	Writable Properties	Proprietary Properties					
			Property Name	ID	Datatype	Access	Use	Property Range Restrictions
			DST_Offset	1350	Integer	Read/write	Used to compute local time when daylight savings time is in effect.	-780 to +780
			DST_Configuration	1351	Octet string	Read/write	Exposes DST configuration as an octet string.	12 octets
			DCO_Poll_Interval	1352	Unsigned	Read/write	Device communication status object polling interval in seconds	10-1000
			Remote_IO_Port_Config	1361	Unsigned	Read/write	Remote I/O port configuration 0 – not configured 1 – reserved 2 – Modbus master 3 – Modbus slave	0-3
			Remote_IO_Timeout	1362	Unsigned	Read/write	Remote I/O port timeout in seconds	1-9999
			Remote_IO_Baudrate	1363	Unsigned	Read/write	Remote I/O Port baud rate 0, 1 – 9600 2 – 19200 3 – 38400 4 – 76800 5 – 115000	0-5
			Remote_IO_Data_Bits	1364	Unsigned	Read/write	Remote I/O port data bits setting 0 – 8 bits 1 – 5 bits 2 – 6 bits 3 – 7 bits	0-3
			Remote_IO_Parity	1365	Unsigned	Read/write	Remote I/O port parity setting 0 – none 1 – odd 2 – even 3 – mark 4 – space	0-4
			Remote_IO_Stop_Bits	1366	Unsigned	Read/write	Remote I/O port stop bit setting 0 – 1 stop bit 1 – 2 stop bits	0-1
			Modbus_Slave_Trans_Mode	1367	Unsigned	Read/write	Remote I/O port Modbus slave transmission mode 0 – RTU 1 – ASCII	0-1
			Modbus_Slave_Address	1368	Unsigned	Read/write	Remote I/O port Modbus slave address	1-247

a.Limited to a maximum of 20 characters.

## Data Link Layer Options

### ■ BACnet IP, (Annex J)

■ Able to register as a Foreign Device

### ■ ISO 8802-3, Ethernet (Clause 7)

□ ANSI/ATA 878.1, 2.5 Mb. ARCNET (Clause 8)

□ ANSI/ATA 878.1, RS-485 ARCNET (Clause 8), baud rate(s): \_\_\_\_\_

■ MS/TP master (Clause 9), baud rate(s): 9600, 19.2k, 38.4k, 76.8k bps

□ MS/TP slave (Clause 9), baud rate(s): \_\_\_\_\_

□ Point-To-Point, EIA 232 (Clause 10), baud rate(s): \_\_\_\_\_

□ Point-To-Point, modem, (Clause 10), baud rate(s): \_\_\_\_\_

□ LonTalk, (Clause 11), medium: \_\_\_\_\_

□ Other: \_\_\_\_\_

## Device Address Binding

Is static device binding supported? (This is currently necessary for two-way communication with MS/TP slaves and certain other devices.)     Yes     No

## Networking Options

### ■ Router, Clause 6 – List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.:

BACnet/IP-Ethernet, Ethernet-MS/TP, MS/TP-BACnet/IP

□ Annex H.3, BACnet Tunneling Router over UDP/IP

### ■ BACnet/IP Broadcast Management Device (BBMD)

Does the BBMD support registrations by Foreign Devices?     Yes     No

□ MS/TP Slave Proxy

## Character Sets Supported

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

■ ANSI X3.4

□ IBM™/Microsoft™ DBCS

□ ISO 8859-1

□ ISO 10646 (UCS-2)

□ ISO 10646 (ICS-4)

□ JIS C 6226

## Non-BACnet Equipment and Network(s) Supported

If this product is a communication gateway, describe the non-BACnet equipment and network(s) that the gateway supports:

None.

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