BACnet Protocol Implementation Conformance Statement

V1.1 - 07/26

inBiot

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Protocol Implementation Conformance Statement

Overview

Vendor Name: inBiot Monitoring S.L.

Product Name: MICA

BACnet Protocol Revision: 19

Product Description

MICA is an intelligent indoor air quality monitor. Developed by us, it is designed to provide accurate, accessible and real-time monitoring of the main parameters affecting health and well-being in enclosed spaces.

Certified by international standards such as WELL and RESET, the MICA device enables companies, institutions and building managers to optimize their spaces in terms of health, sustainability and energy efficiency.

Features:

- Versatility and accuracy: MICA is available in different versions (MINI, MICA, PLUS, WELL) depending on the parameters you need, adapting to every need, with high precision sensors and long lifetime (+10 years).
- Intuitive interface: Through the My inBiot platform, it allows real-time data visualization, alert generation, report sharing and air quality certification.
- Multiple connectivity options: Compatible with both Wi-Fi and Ethernet networks. Also compatible with NB-IoT, LoRaWAN and Sigfox for My inBiot platform.
- Easy installation and configuration: MICA can be configured in minutes from the inBiot Setup mobile app, without the need for advanced technical knowledge.
- MICA supports BACnet/IP protocol through IPv4 with UDP port 47808(0xBAC0).

Standardized Device Profile Supported (Annex L)

BACnet Smart Sensor (B-SS)

Interoperability Building Blocks Supported (BIBBs) (Annex K)

BIBB Code	BIBB NAME	DESCRIPTION	DEVICE ROLE
DS-RP-B	Data Sharing - ReadProperty-B	Server responds to read requests.	Server (responds to requests)
DS-WP-B	Data Sharing - WriteProperty-B	Allows writing to properties.	Server (responds to requests)
DS-WPM-B	WritePropertyMultiple-B	Allows multiple properties to be written at once.	Server (responds to requests)
DS-COV-B	Change Of Value-B	Supports subscriptions to change-of-value notifications.	Server (responds to requests)
DS-RPM-B	ReadPropertyMultiple-B	Supports reading multiple properties at once.	Server (responds to requests)
DM-DDB-B	Device Discovery-B	Responds to discovery requests.	Server (responds to requests)
DM-DCC-B	Communication Control-B	Controls the device's communication state.	Server (responds to requests)
DM-RD-B	ReinitializeDevice-B	Supports device reinitialization.	Server (responds to requests)
DM-DOB-B	Dynamic Object Binding-B	Supports dynamic object binding.	Server (responds to requests)

Data Link Layer Options

- BACnet IP, (Annex J)
- BACnet/IP (Annex J), Foreign Device

Physical Network Interface Options

INTERFACE TYPE	DESCRIPTION	NOTES
Wired Ethernet	10/100 Base-T Ethernet (RJ-45)	DHCP or static IP configurable Auto negotiation full-duplex and half-duplex
Wireless LAN (Wi-Fi)	IEEE 802.11b/g/n (2.4 GHz)	DHCP or static IP configurable Encryption supported: • WPA3 PSK • WPA2 Enterprise • WPA2 PSK • WPA PSK • WAPI PSK • WEP (no authentication)

Interface selection through free proprietary application.
Only one interface may be active at a time.

Standard Object Types Supported:

MICA devices support the following objects:

- Analog Input
- Analog Output
- Binary Output
- Device
- Network Port

None of the objects supported are dynamically creatable or deletable.

Object instances

Analog Input

ID	OBJECT NAME	NOTES	UNITS
0	Temperature	Contains information on sensed temperature	ºC, ºF, K
1	Humidity	Contains information on sensed humidity	RH%
2	CO_2	Contains information on sensed CO_2	ppm
3	TVOC	Contains information on sensed TVOC	ppb (default), 0-500 index[1], µg/m³ (WELL)[2], µg/m³ (Reset)[2]
4	PM2.5	Contains information on sensed PM2.5	µg/m³
5	PM10	Contains information on sensed PM10	µg/m³
6	PM1.0	Contains information on sensed PM1.0	µg/m³
7	PM4.0	Contains information on sensed PM4.0	µg/m³
8	Formaldehyde	Contains information on sensed Formaldehyde	µg/m³ (default), ppb
9	O_3	Contains information on sensed O_3	ppb (default), µg/m³
10	NO_2	Contains information on sensed NO_2	ppb (default), µg/m³
11	CO	Contains information on sensed CO	ppm (default), µg/m³
12	Noise	Contains information on sensed Noise	dB
13	Luminosity	Contains information on sensed Luminosity	lux
14	Ventilation Efficiency Indicator	Contains information on sensed Ventilation Efficienc	0-100 index[1]
15	Thermohygrometric Comfort Indicator	Contains information on sensed Thermohygrometric Comfort	0-100 index[1]
16	Resistance to Virus Spread Indicator	Contains information on sensed Resistance to Virus	0-100 index[1]
17	Indoor Air Quality Indicator	Contains information on sensed Indoor Air Quality	0-100 index[1]
18	Resistance to Mold Growth	Contains information on sensed Resistance to Mold Growth	0-100 index[1]

[1] Index are referenced as NO_UNITS (95) according to the BACnet standard. For more information about the index see de device's reference.

[2] TVOC conversion method to µg/m³ (whether it follows WELL's or RESET's standard) is determined by the present value of the Analog Output 3 (see Analog Output table below).

Analog Output

ID	OBJECT NAME	NOTES
0	CO_2 calibration Cycle	Configures CO_2 sensor calibration cycle. Acceptable range from 1-5 inclusive. Values: 1 -> 48h calibration cycle (default) 2-> 24h calibration cycle 3-> 7 days calibration cycle 4-> 15 days calibration cycle 5-> Calibration disabled
1	LED Parameter	Configures according to what parameter the led ring will determine its colors (green, yellow or red). Acceptable from 1-15 depending on the model: MINI: 0 -> Ventilation Efficiency Indicator (default) 1-> Thermohygrometric Comfort Indicator 2-> Temperature 3-> Humidity 4-> CO_2 MICA: All present in MINI + the following: 5-> TVOC 6-> PM2.5 7-> PM10 8-> Resistance to Virus Spread Indicator 9-> Indoor Air Quality Indicator PLUS: All present in MICA + the following: 10-> PM1.0 11-> PM4.0 12-> Formaldehyde WELL:All present in PLUS + the following: 13-> O_3 14-> NO_2 15-> CO
2	TVOC Conversion Method	Configures the conversion method used to express TVOC measurement in TVOC. You can select between WELL's conversion method or RESET's conversion method: 1-> conversion follows WELL standard 2-> conversion follows RESET standard

Binary Output

ID	OBJECT NAME	NOTES
0	LED indicator	If set to 1 the LED ring indicator will be turned on. If 0 it will be turned off.
1	Touch Button	If set to 1 the Touch Button will be available active and responsive. If set to 0 it won't.

Device Object

ID	OBJECT NAME	NOTES
"device ID selected by user through configuration app"	"Name selected by user"	

Network Port Object

ID	OBJECT NAME	NOTES
0	"Ethernet Port" if Ethernet layer selected "WiFi port" if WiFi layer selected	

Object Properties

Analog Input

PROPERTY NAME	BACNET APPLICATION TAG TYPE	WRITABLE	NOTES
Object_Name	CHARACTER_STRING		
Object_Type	ENUMERATED		
Present_Value	REAL	X	Only writable if Out_Of_Service is true
Status_Flags	BIT_STRING		
Event_State	ENUMERATED		
Out_Of_Service	BOOLEAN	X	
Units	ENUMERATED	X	Writable to configure the units in which the parameters will be displayed. Only available on the units referenced in this guide and in the parameters that have more than one unit.
Description	CHARACTER_STRING		
Reliability	ENUMERATED		Object ID 2 (CO_2), 9 (O_3), 10 (NO_2), and 11 (CO) will set reliability to UNRELIABLE_OTHER while the sensor is preheating. This may last 2-3 mins for CO_2 and 12-13 hours for O_3, NO_2 and CO.
Cov_Increment	REAL	X	

Analog Output

PROPERTY NAME	BACNET APPLICATION TAG TYPE	WRITABLE	NOTES
Object_Name	CHARACTER_STRING		
Object_Type	ENUMERATED		
Present_Value	REAL	X	
Status_Flags	BIT_STRING		
Event_State	ENUMERATED		
Out_Of_Service	BOOLEAN	X	
Units	ENUMERATED		
Priority_Array	ARRAY_REAL	X	
Relinquish_Default	REAL		
Current_Command_Priority	UNSIGNED_INT		
Description	CHARACTER_STRING		
Cov_Increment	REAL	X	

Binary Outputs

PROPERTY NAME	BACNET APPLICATION TAG TYPE	WRITABLE	NOTES
Object_Name	CHARACTER_STRING		
Object_Type	ENUMERATED		
Present_Value	ENUMERATED	X	
Status_Flags	BIT_STRING		
Event_State	ENUMERATED		
Out_Of_Service	BOOLEAN	X	
Polarity	ENUMERATED		
Priority_Array	ARRAY_ENUMERATED		
Relinquish_Default	ENUMERATED		
Current_Command_Priority	UNSIGNED_INT		
Description	CHARACTER_STRING		

Device Object

PROPERTY NAME	BACNET APPLICATION TAG TYPE	WRITABLE	NOTES
Object_Identifier	OBJECT_ID		Configurable through our mobile app
Object_Name	CHARACTER_STRING	X	Preserved during device resets
System_Status	ENUMERATED		
Vendor_Name	ENUMERATED		
Vendor_Identifier	UNSIGNED_INT		
Model_Name	CHARACTER_STRING		
Firmware_Revision	CHARACTER_STRING		
Application_Software_Version	CHARACTER_STRING		
Protocol_Version	UNSIGNED_INT		
Protocol_Revision	UNSIGNED_INT		
Protocol_Services_Supported	BIT_STRING		
Protocol_Object_Types_Supported	BIT_STRING		
Object_List	ARRAY _OBJECT_ID		
Max_APDU_Length_Accepted	UNSIGNED_INT		
Segmentation_Supported	ENUMERATED		
APDU_Timeout	UNSIGNED_INT	X	
Number_Of_APDU_Retries	UNSIGNED_INT	X	
Device_Address_Binding	ARRAY _OBJECT_ID		
Database_Revision	UNSIGNED_INT		
Description	CHARACTER_STRING	X	
Time_Synchronization_Recipients	BACNET_RECIPIENT		
UTC_Time_Synchronization_Recipients	BACNET_RECIPIENT		
UTC_Offset	SIGNED_INT		
Local_Date	DATE		
Local_Time	TIME		
Active_COV_Subscriptions	COV_SUBSCRIPTIONS		

Network Port Object

PROPERTY NAME	BACNET APPLICATION TAG TYPE	WRITABLE	NOTES
Object_Identifier	OBJECT_ID		
Object_Name	CHARACTER_STRING		
Object_Type	ENUMERATED		
Status_Flags	BIT_STRING		
Reliability	ENUMERATED		
Out_Of_Service	BOOLEAN		
Network_Type	ENUMERATED		
Protocol_Level	ENUMERATED		
Changes_Pending	BOOLEAN		
MAC_Address	OCTET_STRING		
Network_Number	UNSIGNED_INT	X	Preserved during device resets
Network_Number_Quality	ENUMERATED		
APDU_Length	UNSIGNED_INT		
BACnet_IP_Mode	ENUMERATED		
IP_Address	OCTET_STRING		
BACnet_IP_UDP_Port	UNSIGNED_INT		
IP_Subnet_Mask	OCTET_STRING		
IP_Default_Gateway	OCTET_STRING		
IP_DNS_Server	OCTET_STRING		
Link_Speed	REAL		

Segmentation Capability

Not supported.

Device Address Binding

Character Sets Supported

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

◉ ISO 10646 (UTF-8) ⓞ IBM™/Microsoft™ DBCS ◉ ISO 8859-1

ⓞ ISO 10646 (UCS-2) ⓞ ISO 10646 (UCS-4) ⓞ JIS X 0208