AddMe III & AddMe Lite
BACnet MS/TP Programmable I/O
Properties Summary

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AddMe III and AddMe Lite
BACnet MS/TP Programmable I/O

User Guide
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This manual corresponds with firmware version 1.01.

IMPORTANT SAFETY CONSIDERATIONS:

Proper system design is required for reliable and safe operation of distributed control systems incorporating AddMe series I/O and other such devices. It is extremely important for the user and system designer to consider the effects of loss of power, loss of communications, and failure of components in the design of any monitoring or control application. This is especially important where the potential for property damage, personal injury, or loss of life may exist. By using the AddMe series I/O or any other Control Solutions, Inc., product, the user has agreed to assume all risk and responsibility for proper system design as well as any consequence for improper system design.

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AddMe BACnet Programmable I/O Overview

The AddMe III and AddMe Lite BACnet Programmable I/O devices are configured via the MS/TP network. Optionally, a user program can also be downloaded via the file object, and executed via the program object.

Both models have AI objects representing their physical analog/universal inputs. Both models have additional AI objects that are not assigned to physical I/O. These objects are available to the user program for passing Real data to and from the program.

The AddMe III has AO objects representing the analog outputs. Both models have BO objects representing their physical discrete outputs. The AO and BO objects are commandable with the standard BACnet priority array.

Both models have MI objects that are not committed to any physical I/O. These objects are available to the user program for passing Unsigned (integer) data to and from the program.

The purpose of this document is to provide a hard copy summary of the BACnet objects implemented in AddMe III and AddMe Lite. Full details, wiring guides, programming guide, and the like, are available for download at www.csimn.com.

ANALOG INPUT

Object_Identifier (75)	BACnetObjectIdentifier
Object_Name (77)	CharacterString "Analog Input *n*"
Object_Type (79)	BACnetObjectType ENUMERATED: analog-input (0) analog-output (1) binary-output (4) multistate-input (13) device (8) file (10) program (16)
Present_Value (85) (W)	REAL (no index, no priority) (writeable only when out of service)
Status_Flags (111)	BACnetStatusFlags BIT STRING: fault(1), out-of-service(3)
Event_State (36)	BACnetEventState ENUMERATED: normal(0), fault(1)
Out_Of_Service (81) (W)	BOOLEAN
Units (117)	BACnetEngineeringUnits

Vendor Specific Object Properties:

Raw_Data (999)	Unsigned
Config_Word (1001) (W)	Unsigned
Slope (1002) (W)	REAL
Intercept (1003) (W)	REAL

ANALOG OUTPUT

Object_Identifier (75)	BACnetObjectIdentifier
Object_Name (77)	CharacterString "Analog Output *n*"
Object_Type (79)	BACnetObjectType ENUMERATED: analog-input (0) analog-output (1) binary-output (4) multistate-input (13) device (8) file (10) program (16)
Present_Value (85) (W)	REAL (no index)
Status_Flags (111)	BACnetStatusFlags BIT STRING: fault(1), out-of-service(3)
Event_State (36)	BACnetEventState ENUMERATED: normal(0), fault(1)
Out_Of_Service (81) (W)	BOOLEAN
Priority_Array (87)	BACnetPriorityArray SEQUENCE SIZE (16) OF BACnetPriorityValue REAL (each element)
Relinquish_Default (104) (W)	REAL
Units (117)	BACnetEngineeringUnits

Vendor Specific Object Properties:

Slope (1002) (W)	REAL
Intercept (1003) (W)	REAL

BINARY OUTPUT

Object_Identifier (75)	BACnetObjectIdentifier
Object_Name (77)	CharacterString "Binary Output *n*"
Object_Type (79)	BACnetObjectType ENUMERATED: analog-input (0) analog-output (1) binary-output (4) multistate-input (13) device (8) file (10) program (16)
Present_Value (85) (W)	ENUMERATED (no index)
Status_Flags (111)	BACnetStatusFlags BIT STRING: fault(1), out-of-service(3)
Event_State (36)	BACnetEventState ENUMERATED: normal(0), fault(1)
Out_Of_Service (81) (W)	BOOLEAN
Priority_Array (87)	BACnetPriorityArray SEQUENCE SIZE (16) OF BACnetPriorityValue ENUMERATED (each element)
Relinquish_Default (104) (W)	ENUMERATED
Polarity (84)	BACnetPolarity ENUMERATED: normal(0)

Vendor Specific Object Properties:

Config_Word (1001) (W)	Unsigned

MULTISTATE INPUT

Object_Identifier (75)   BACnetObjectIdentifier

Object_Name (77)   CharacterString
                                     "Multistate Input *n*"

Object_Type (79)   BACnetObjectType
                                     ENUMERATED: analog-input (0)
                                     analog-output (1)
                                     binary-output (4)
                                     multistate-input (13)
                                     device (8)
                                     file (10)
                                     program (16)

Present_Value (85) (W)   Unsigned
                                     (no index, no priority)
                                     (writeable only when out of service)

Status_Flags (111)   BACnetStatusFlags
                                     BIT STRING: fault(1), out-of-service(3)

Event_State (36)   BACnetEventState
                                     ENUMERATED: normal(0), fault(1)

Out_Of_Service (81) (W)   BOOLEAN

Number_Of_States (74)   Unsigned

Vendor Specific Object Properties:

(none)

FILE OBJECT

Object_Identifier (75)   BACnetObjectIdentifier

Object_Name (77)   CharacterString
                                          "File *n*"

Object_Type (79)   BACnetObjectType
                                          ENUMERATED: analog-input (0)
                                          analog-output (1)
                                          binary-output (4)
                                          multistate-input (13)
                                          device (8)
                                          file (10)
                                          program (16)

Description (28)   CharacterString

File_Type (43)   CharacterString

File_Size (42)   Unsigned

Read_Only (99)   BOOLEAN

File_Access_Method (41)   BACnetFileAccessMethod
                                          ENUMERATED
                                          stream-access(1)

PROGRAM

Object_Identifier (75)   BACnetObjectIdentifier

Object_Name (77)   CharacterString
                                            "Program *n*"

Object_Type (79)   BACnetObjectType
                                            ENUMERATED: analog-input (0)
                                            analog-output (1)
                                            binary-output (4)
                                            multistate-input (13)
                                            device (8)
                                            file (10)
                                            program (16)

Program_State (92)   BACnetProgramState
                                            ENUMERATED

Program_Change (90) (W)   BACnetProgramRequest
                                            ENUMERATED

Reason_For_Halt (100)   BACnetProgramError
                                            ENUMERATED

Description_Of_Halt (29)   CharacterString

Description (28)   CharacterString

Status_Flags (111)   BACnetStatusFlags
                                            BIT STRING: fault(1), out-of-service(3)

Out_Of_Service (81) (W)   BOOLEAN

Vendor Specific Object Properties:

Program_Header (1006)   OctetString
                                            Size(5)

DEVICE

Object_Identifier (75)	BACnetObjectIdentifier
Object_Name (77)	CharacterString
Object_Type (79)	BACnetObjectType
System_Status (112)	BACnetDeviceStatus
Vendor_Name (121)	CharacterString
Vendor_Identifier (120)	Unsigned16 (should always return 208)
Model_Name (70)	CharacterString
Fimrware_Revision (44)	CharacterString
Application_Software_Version (12)	CharacterString
Protocol_Version (98)	Unsigned
Protocol_Revision (139)	Unsigned
Protocol_Services_Supported (97)	BACnetServicesSupported
Protocol_Object_Types_Supported (96)	BACnetObjectTypesSupported
Object_List (76)	BACnetARRAY[N] of BACnetObjectIdentifier
Max_APDU_Length_Accepted (62)	Unsigned
Segmentation_Supported (107)	BACnetSegmentation
APDU_Timeout (11)	Unsigned
Number_Of_APDU_Retries (73)	Unsigned
Device_Address_Binding (30)	List of BACnetAddressBinding
Database_Revision (155)	Unsigned

Vendor Specific Object Properties:

Out Of Service Mask (1206) (W)	OctetString

MSTP_Port_Baud_Rate (1201) (W)   ENUMERATED:
9600(0), 19200(1), 38400(2), 76800(3)

Station_ID (1202) (W)   Unsigned

Device_ID (1203) (W)   Unsigned

Max Masters (1204) (W)   Unsigned

Reinit_Password (1205) (WO)   CharacterString
Note: This property is write-only,
and is only writeable in INIT mode.

NOTE: Changes to port settings (properties 1201-1205) will take effect only upon issuing a Reinit Device command to the device. Upon receiving the Reinit Device, the gateway will commit these changes to EEPROM, and then reset itself so the new settings can take effect.

NOTE: The port settings will only be re-written if a WARM START command is issued. A cold start will only reset the device (same as power-up reset).

INDICATORS – AddMe Lite

The LED indicators showing MS/TP activity are inside AddMe Lite and may be viewed through the vent slots on the lower side.
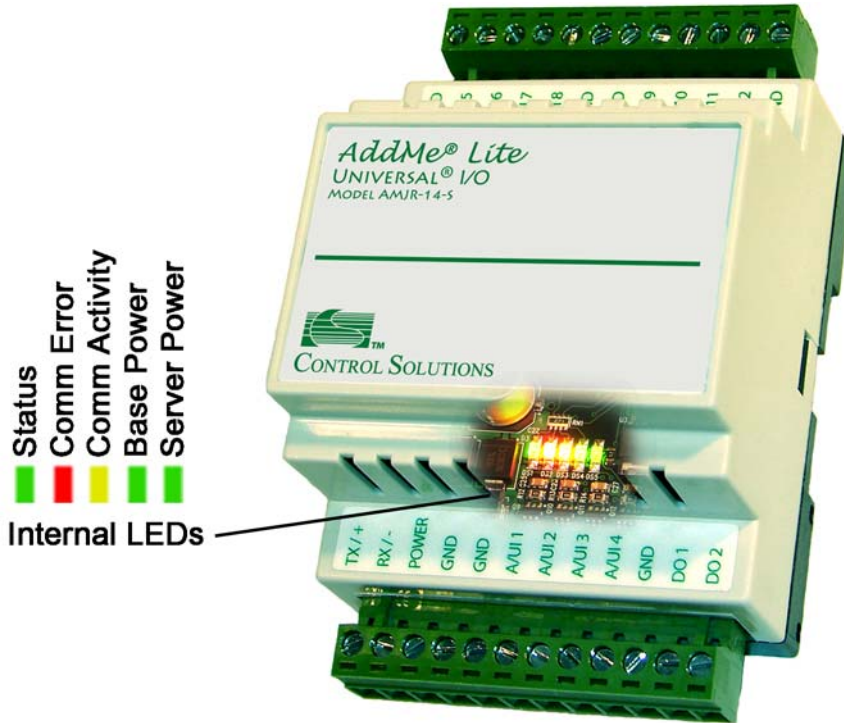
BACnet and System Indicators

Status – Green, flashes each time the MS/TP token is passed or "poll for master" is sent. This is effectively a BACnet activity indicator.
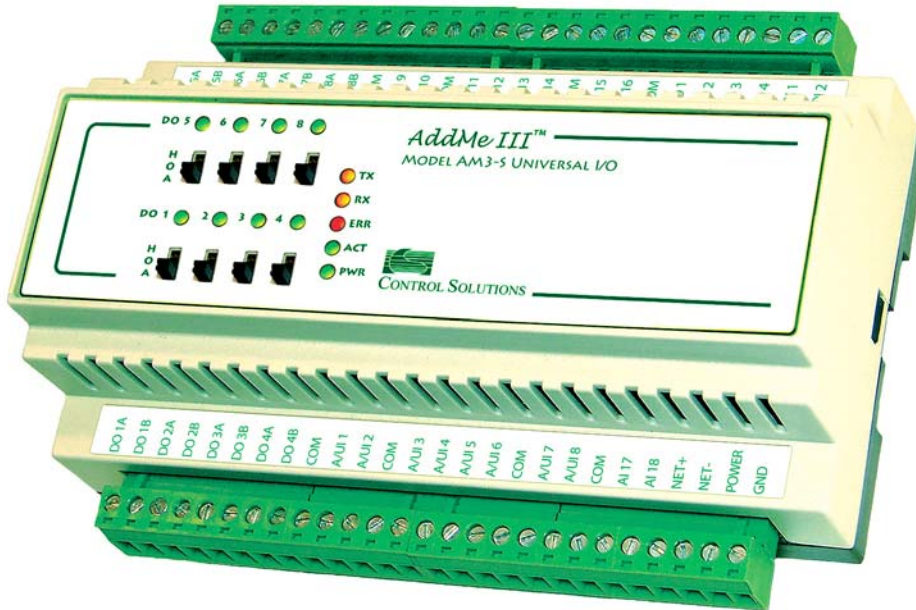
MS/TP Comm Error – Red, flashes each time a request is received for which an error is returned to the requesting client.

MS/TP Comm Activity – Yellow, flashes each time a request is received for which a good response is returned to the requesting client.

Power – Green, remains on if power is present. The gateway base board has two power supplies, a 5V and a 3.3V supply. Only the 5V supply is used in this application, but the 3.3V indicator will still be present.

INDICATORS – AddMe III

The LED indicators showing MS/TP activity are on the front of AddMe III.

BACnet and System Indicators

TX – Yellow, flashes each time a non-error response is sent back to the requesting client.

RX – Yellow, flashes each time a request is received from the requesting client.

ERR – Red, flashes each time a request is received for which an error is returned to the requesting client.

ACT – Green, flashes each time the MS/TP token is passed or "poll for master" is sent. This is effectively a BACnet activity indicator.

PWR – Green, remains on if power is present.

MS/TP and POWER WIRING

Connect the RS-485 network connections to the (+) and (-) terminals where shown. Connect power to the "power" terminal, and power common/ground to the "ground" terminal.

Power may be 10-30VDC, or 12-24VAC. This gateway uses a half wave rectifier which means it is not required to have a dedicated isolation transformer (ungrounded AC) as with other gateways in the Control Solutions gateway family that use a full wave bridge

rectifier. There is no separate AC common on the Babel Buster 485XM. One side of AC will be grounded.

ERROR CODES

Error codes returned via BACnet consist of an error class and code. The most common errors are listed below with class in parenthesis followed by code. Some applications will interpret these for you and provide a text description.

(property) code 9	Invalid data type
(property) code 32	Unknown property
(property) code 37	Value out of range
(property) code 40	Write access denied
(property) code 42	Invalid array index
(client) code 30	Timeout
(client) code 31	Unknown device
(object) code 31	Unknown object
(service) code 7	Inconsistent parameters
(service) code 10	Invalid access method
(service) code 29	Service request denied
(abort) code 4	Segmentation not supported
(reject) code 4	Invalid tag
(security) code 26	Password failure
(resource) code 0	Resource error – "other"