

BACnet Application Map for Network Management Card for Easy UPS, 3-Phase

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Introduction

This document details the BACnet objects and properties supported by the Network Management Card for Easy UPS, 3-Phase devices, available on the [APC website](#).

Additional Information

- Information on the BACnet protocol specification can found at www.bacnet.org.
- APC recommends [EcoStruxure Building Operation](#) software (formerly known as StruxureWare Building Operation/SBO) for integrated monitoring, control and management of BACnet-enabled devices.
- See the [Network Management Card for Easy UPS User Guide](#) available on the [APC website](#) for more information on configuring the NMC for BACnet.
- The Network Management Card for Easy UPS, 3-Phase (AP9547) supports BACnet/IP only.
990-6445A

Analog Value Objects

Analog value objects provide information on UPS data properties made available via the BACnet protocol:

- BACnet Units – the format of the analog (numeric) values returned. The unit format complies with the BACnet standard, and includes the enumerated code defined in the standard, which is used to represent it.
- COV Increment – the degree (in decimal places) by which a property value can vary before a Change of Value is reported to BACnet clients subscribed to COV notifications.
- Access values – **RO** is Read Only, **RW** is Read/Write.

Index	BACnet Name	Description	BACnet Units	COV Increment (default)	Access
0	Runtime	How long the UPS can support its present load while running on battery power.	seconds (73)	0	RO
1	BatteryTemperature	Temperature as reported by the sensor in the battery compartment, in Degrees C.	degrees-Celsius (62)	0	RO
2	UtilityInputVoltage1	The AC voltage (VAC) being received by the UPS.	volts (5)	0	RO
3	UtilityInputVoltage2	The AC voltage (VAC) being received by the UPS.	volts (5)	0	RO
4	UtilityInputVoltage3	The AC voltage (VAC) being received by the UPS.	volts (5)	0	RO
5	UtilityInputVoltage12	The AC voltage (VAC) phase to phase being received by the UPS.	volts (5)	0	RO
6	UtilityInputVoltage23	The AC voltage (VAC) phase to phase being received by the UPS.	volts (5)	0	RO
7	UtilityInputVoltage31	The AC voltage (VAC) phase to phase being received by the UPS.	volts (5)	0	RO
8	UtilityInputCurrent1	The current, in Amps, being received by the UPS.	amperes (3)	0	RO
9	UtilityInputCurrent2	The current, in Amps, being received by the UPS.	amperes (3)	0	RO
10	UtilityInputCurrent3	The current, in Amps, being received by the UPS.	amperes (3)	0	RO
11	UtilityInputFrequency	The frequency in Hertz (Hz) of the voltage being received by the UPS.	hertz (27)	0	RO

Index	BACnet Name	Description	BACnet Units	COV Increment (default)	Access
12	OutputFrequency	The frequency in Hertz (Hz) of the output voltage.	hertz (27)	0	RO
13	OutputVoltage1	The AC voltage (VAC) that the UPS is supplying to its load.	volts (5)	0	RO
14	OutputVoltage2	The AC voltage (VAC) that the UPS is supplying to its load.	volts (5)	0	RO
15	OutputVoltage3	The AC voltage (VAC) that the UPS is supplying to its load.	volts (5)	0	RO
16	OutputVAPercentagePhase1	The UPS load as a percentage of available VA.	percent (98)	0	RO
17	OutputVAPercentagePhase2	The UPS load as a percentage of available VA.	percent (98)	0	RO
18	OutputVAPercentagePhase3	The UPS load as a percentage of available VA.	percent (98)	0	RO
19	OutputLoadCurrent1	The current, in Amps, supplied to the load.	amperes (3)	0	RO
20	OutputLoadCurrent2	The current, in Amps, supplied to the load.	amperes (3)	0	RO
21	OutputLoadCurrent3	The current, in Amps, supplied to the load.	amperes (3)	0	RO
22	OutputWattsPercentagePhase1	The UPS load as a percentage of available Watts.	percent (98)	0	RO
23	OutputWattsPercentagePhase2	The UPS load as a percentage of available Watts.	percent (98)	0	RO
24	OutputWattsPercentagePhase3	The UPS load as a percentage of available Watts.	percent (98)	0	RO
25	BypassInputFrequency	Measured frequency on the bypass input for separate bypass feed.	hertz (27)	0	RO
26	BypassInputVoltage12	The AC voltage (VAC) phase to phase used when the UPS is in bypass mode. This option is not available for all UPS devices.	volts (5)	0	RO
27	BypassInputVoltage23	The AC voltage (VAC) phase to phase used when the UPS is in bypass mode. This option is not available for all UPS devices.	volts (5)	0	RO

Index	BACnet Name	Description	BACnet Units	COV Increment (default)	Access
28	BypassInputVoltage31	The AC voltage (VAC) phase to phase used when the UPS is in bypass mode. This option is not available for all UPS devices.	volts (5)	0	RO
29	PositiveBatteryVoltage	Measured battery voltage - positive battery bus. Or the battery voltage if there is no negative bus.	volts (5)	0	RO
30	NegativeBatteryVoltage	Measured battery voltage - negative battery bus.	volts (5)	0	RO
31	BatteryStateOfCharge	The percentage of the UPS battery capacity that is available to support the attached equipment.	percent (98)	10	RO
32	PositiveBatteryCurrent	The current being battery positive	amperes (3)	0	RO
33	NegativeBatteryCurrent	The current being battery negative	amperes (3)	0	RO
34	OutputActivePowerL1	Measure the active power on the phase 1	kilowatt (48)	0	RO
35	OutputActivePowerL2	Measure the active power on the phase 2	kilowatt (48)	0	RO
36	OutputActivePowerL3	Measure the active power on the phase 3	kilowatt (48)	0	RO
37	OutputApparantPowerL1	Measure the apparent power on the phase 1	kilovolt-amperes (9)	0	RO
38	OutputApparantPowerL2	Measure the apparent power on the phase 2	kilovolt-amperes (9)	0	RO
39	OutputApparantPowerL3	Measure the apparent power on the phase 3	kilovolt-amperes (9)	0	RO
40	UPSapparentpowerrating	The rated apparent full power.	kilovolt-amperes (9)	0	RO
41	DCcapacitorMaintenanceCycle	Measure DC capacitor maintainance cycle period	days (70)	0	RO
42	ACcapacitorMaintenanceCycle	Measure AC capacitor maintainance cycle period	days (70)	0	RO
43	AuxPowerSupplyMaintenanceCycle	Measure the Aux PowerSupply Maintenance Cycle period	days (70)	0	RO
44	AirFilterMaintenanceCycle	Measure the Air filter maintenance cycle period	days (70)	0	RO
45	BatteryMaintenanceCycle	Measure the battery maintenance cycle period	days (70)	0	RO
46	WarrantyCycle	Measure the Warranty Cycle timeperiod	days (70)	0	RO

Index	BACnet Name	Description	BACnet Units	COV Increment (default)	Access
47	DCcapacitorRunningTime	Measure the DC capacitor running time	days (70)	0	RO
48	ACcapacitorRunningTime	Measure the AC capacitor running time	days (70)	0	RO
49	BatteryRunningTime	Measure the Air filter running time period	days (70)	0	RO
50	AmbientTemperature	Measure the Ambient temperature	degrees-Celsius (62)	0	RO
51	BypassInputVoltage1	The AC voltage (VAC) being received from Bypass Supply	volts (5)	0	RO
52	BypassInputVoltage2	The AC voltage (VAC) being received from Bypass Supply	volts (5)	0	RO
53	BypassInputVoltage3	The AC voltage (VAC) being received from Bypass Supply	volts (5)	0	RO
54	OutputVoltage12	The Phase12 AC voltage (VAC) that the UPS is supplying to its load.	volts (5)	0	RO
55	OutputVoltage23	The Phase23 AC voltage (VAC) that the UPS is supplying to its load.	volts (5)	0	RO
56	OutputVoltage31	The Phase31 AC voltage (VAC) that the UPS is supplying to its load.	volts (5)	0	RO
57	AuxPowerSupplyRunningTime	Measure the Aux PowerSupply running time	months (68)	0	RO
58	AirFilterRunningTime	Measure the Aux PowerSupply running time	months (68)	0	RO
59	WarrantyElapsedTime	Measure Warranty elapsed time	months (68)	0	RO

Binary Value Objects

Binary value objects provide information on UPS events (alarms) and binary data properties made available via the BACnet protocol:

- Alarm:
 - **Yes** indicates that the binary value property is a UPS event alarm, for which a notification will be sent to the recipients in the notification class defined in the Notification Class Object. UPS events are model-specific, and only events supported by the UPS are accessible via the Building Management System used.
 - **No** indicates a UPS data point property that has a binary value, e.g. a state.
- Access values - **RO** is Read Only, **RW** is Read/Write.

Index	BACnet Name	Description	Alarm	Access
0	LostUPSComm	NMC lost comm with UPS	Yes	RO
1	Overload	The load exceeds 100% of rated capacity.	Yes	RO
2	SelfTestInProgress	UPS self-test in progress.	Yes	RO
3	LowBattery	The battery power is too low to continue to support the load; the UPS will go on bypass or shutdown if input power does not return to normal soon	Yes	RO
4	OnBattery	On battery.	Yes	RO
5	InBypassBypassSwitch	In bypass in response to the bypass switch at the UPS	Yes	RO
6	FanProblem	A base module fan not operating properly.	Yes	RO
7	BatteryChargerInoperable	A battery charger fault is inoperable.	Yes	RO
8	BatteryDisconnected	The battery is not installed properly.	Yes	RO
9	LostUPSCommOnBat	Lost the management interface-to-UPS communication while the UPS was on battery.	Yes	RO
10	UPSTempCritical	Rectifier over temperature	Yes	RO
11	OutputShortCircuit	The output has a short-circuit.	Yes	RO
12	InverterInoperable	An inverter is inoperable.	Yes	RO
13	BatteryNearEndOfLife	Battery near end of life. Order replacement battery.	Yes	RO

Index	BACnet Name	Description	Alarm	Access
14	EPOActive	Emergency Power Off (EPO) active.	Yes	RO
15	WeakBattery	Weak battery exist.Battery replacement needed.	Yes	RO
16	PowerSavingMode	ECO Mode.	Yes	RO
17	InverterShutdownOverload	Inverter overload shutdown	Yes	RO
18	OverloadOnInstallation	Overload On Installation.	Yes	RO
19	NoMainPower	Main input is not available due to inoperable condition.	Yes	RO
20	RectifierFailure	Rectifier InOperable.	Yes	RO
21	InverterFault	Inverter Module InOperable.	Yes	RO
22	AuxPowerFault	Auxillary Power Fault.	Yes	RO
23	InverterOverTemperature	Inverter Temperature Overload Exist	Yes	RO
24	InverterOverLoad	Inverter Over Load	Yes	RO
25	UPSOverLoad	UPS Over load	Yes	RO
26	InverterFailure	Inverter Module Failure	Yes	RO
27	InputFailure	Input Main Failure	Yes	RO
28	RectifierFault	Rectifier InOperable.	Yes	RO
29	LoadNotPowered	The output power is turned off	Yes	RO
30	BreakerQ2UOBOpen	Breaker Q2 UOB Open	Yes	RO
31	BypassOverTemperature	Bypass Over Temperature	Yes	RO
32	OnBattery2	On battery power in response to an input power problem.	Yes	RO

Character String Value Objects

Character string value objects provide information on UPS data properties that return character strings via the BACnet protocol:

- Access values - **RO** is Read Only, **RW** is Read/Write.
- Maximum Characters – the maximum number of characters that can be returned for a UPS property.

Index	BACnet Name	Description	Access	Maximum Characters
0	UPSmodel	The UPS model name.	RO	24
1	UPSserialnumber	The UPS serial number.	RO	16
2	UPSfirmwareRevision	The revision number of the UPS firmware.	RO	16
3	SelfTestResult	The result of the most recent UPS self-test (passed, failed, or unavailable) and the date of that test. A self-test cannot be started if a runtime calibration is in progress or the batteries are not sufficiently charged.	RO	100

Multi-State Value Objects

Multi-state value objects provide information on UPS data properties that return a list of options via the BACnet protocol:

- Options – all possible values that can be returned for a UPS multi-value property.
- Access values - **RO** is Read Only, **RW** is Read/Write.

Index	BACnet Name	Description	Options	Access
0	Lastbatterytransfer	The cause of the last switch to battery operation. Excludes Self-Test.	None, Input Failure, UPS Battery Test	RO
1	LastBatteryTestResult	provide the last battery last result	Pass,Fail	RO

Notification Class Object

When UPS event alarms specified in the Binary Value Objects table occur, a notification is sent to the recipients in the notification class defined in the Notification Class Object.

Index	BACnet Name	Description	Access
0	DefaultNotifier	Default Notification Class	RW

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