

Network Management Card for Easy UPS, 3-Phase

BACnet Application Map

990-6445-EN

09/2023

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](#).

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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.

Index of BACnet Objects

Use the table index numbers to find a BACnet object name and type. The table index values refer to the unique index number of each object property - see Analog Value Objects, Binary Value Objects, Character String Value Objects, and Multi-State Value Objects.

BACnet Name	BACnet Object Type	Table Offset
ACcapacitorMaintenanceCycle	Analog Value	42
ACcapacitorRunningTime	Analog Value	48
AirFilterMaintenanceCycle	Analog Value	44
AirFilterRunningTime	Analog Value	58
AmbientTemperature	Analog Value	50
AuxPowerFault	Binary Value	22
AuxPowerSupplyMaintenanceCycle	Analog Value	43
AuxPowerSupplyRunningTime	Analog Value	57
BatteryChargerInoperable	Binary Value	7

BACnet Name	BACnet Object Type	Table Offset
BatteryDisconnected	Binary Value	8
BatteryMaintenanceCycle	Analog Value	45
BatteryNearEndOfLife	Binary Value	13
BatteryRunningTime	Analog Value	49
BatteryStateOfCharge	Analog Value	31
BatteryTemperature	Analog Value	1
BreakerQ2UOBOpen	Binary Value	30
BypassInputFrequency	Analog Value	25
BypassInputVoltage1	Analog Value	51

BACnet Name	BACnet Object Type	Table Offset
BypassInputVoltage12	Analog Value	26
BypassInputVoltage2	Analog Value	52
BypassInputVoltage23	Analog Value	27
BypassInputVoltage3	Analog Value	53
BypassInputVoltage31	Analog Value	28
BypassOverTemperature	Binary Value	31
DCcapacitorMaintenanceCycle	Analog Value	41
DCcapacitorRunningTime	Analog Value	47
EPOActive	Binary Value	14

BACnet Name	BACnet Object Type	Table Offset
FanProblem	Binary Value	6
InBypassBypassSwitch	Binary Value	5
InputFailure	Binary Value	27
InverterFailure	Binary Value	26
InverterFault	Binary Value	21
InverterInoperable	Binary Value	12
InverterOverLoad	Binary Value	24
InverterOverTemperature	Binary Value	23
InverterShutdownOverload	Binary Value	17
LastBatteryTestResult	Multi-State Value	1

BACnet Name	BACnet Object Type	Table Offset
Lastbatterytransfer	Multi-State Value	0
LoadNotPowered	Binary Value	29
LostUPSComm	Binary Value	0
LostUPSCommOnBat	Binary Value	9
LowBattery	Binary Value	3
NegativeBatteryCurrent	Analog Value	33
NegativeBatteryVoltage	Analog Value	30
NoMainPower	Binary Value	19
OnBattery	Binary Value	4
OnBattery2	Binary Value	32

BACnet Name	BACnet Object Type	Table Offset
OutputActivePowerL1	Analog Value	34
OutputActivePowerL2	Analog Value	35
OutputActivePowerL3	Analog Value	36
OutputApparantPowerL1	Analog Value	37
OutputApparantPowerL2	Analog Value	38
OutputApparantPowerL3	Analog Value	39
OutputFrequency	Analog Value	12
OutputLoadCurrent1	Analog Value	19
OutputLoadCurrent2	Analog Value	20
OutputLoadCurrent3	Analog Value	21
OutputShortCircuit	Binary Value	11

BACnet Name	BACnet Object Type	Table Offset
OutputVAPercentagePhase1	Analog Value	16
OutputVAPercentagePhase2	Analog Value	17
OutputVAPercentagePhase3	Analog Value	18
OutputVoltage1	Analog Value	13
OutputVoltage12	Analog Value	54
OutputVoltage2	Analog Value	14
OutputVoltage23	Analog Value	55
OutputVoltage3	Analog Value	15
OutputVoltage31	Analog Value	56
OutputWattsPercentagePhase1	Analog Value	22
OutputWattsPercentagePhase2	Analog Value	23

BACnet Name	BACnet Object Type	Table Offset
OutputWattsPercentagePhase3	Analog Value	24
Overload	Binary Value	1
OverloadOnInstallation	Binary Value	18
PositiveBatteryCurrent	Analog Value	32
PositiveBatteryVoltage	Analog Value	29
PowerSavingMode	Binary Value	16
RectifierFailure	Binary Value	20
RectifierFault	Binary Value	28
Runtime	Analog Value	0
SelfTestInProgress	Binary Value	2

BACnet Name	BACnet Object Type	Table Offset
SelfTestResult	Character String	4
UPSapparentpowerrating	Analog Value	40
UPSfirmwareRevision	Character String	2
UPSmodel	Character String	0
UPSOverLoad	Binary Value	25
UPSserialNumber	Character String	1
UPSTempCritical	Binary Value	10
UtilityInputCurrent1	Analog Value	8
UtilityInputCurrent2	Analog Value	9

BACnet Name	BACnet Object Type	Table Offset
UtilityInputCurrent3	Analog Value	10
UtilityInputFrequency	Analog Value	11
UtilityInputVoltage1	Analog Value	2
UtilityInputVoltage12	Analog Value	5

BACnet Name	BACnet Object Type	Table Offset
UtilityInputVoltage2	Analog Value	3
UtilityInputVoltage23	Analog Value	6
UtilityInputVoltage3	Analog Value	4
UtilityInputVoltage31	Analog Value	7

BACnet Name	BACnet Object Type	Table Offset
WarrantyCycle	Analog Value	46
WarrantyElapsedTime	Analog Value	59
WeakBattery	Binary Value	15

Analog Value Objects

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

- The BACnet ID is formed using the BACnet object type number (analog value is 2), and the index number.
- 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 ID	BACnet Name	Description	BACnet Units	COV Increment (default)	Access
0	8388610	Runtime	How long the UPS can support its present load while running on battery power.	seconds (73)	0	RO
1	8388611	BatteryTemperature	Temperature as reported by the sensor in the battery compartment, in Degrees C.	degrees-Celsius (62)	0	RO
2	8388612	UtilityInputVoltage1	The AC voltage (VAC) being received by the UPS.	volts (5)	0	RO
3	8388613	UtilityInputVoltage2	The AC voltage (VAC) being received by the UPS.	volts (5)	0	RO
4	8388614	UtilityInputVoltage3	The AC voltage (VAC) being received by the UPS.	volts (5)	0	RO
5	8388615	UtilityInputVoltage12	The AC voltage (VAC) phase to phase being received by the UPS.	volts (5)	0	RO
6	8388616	UtilityInputVoltage23	The AC voltage (VAC) phase to phase being received by the UPS.	volts (5)	0	RO
7	8388617	UtilityInputVoltage31	The AC voltage (VAC) phase to phase being received by the UPS.	volts (5)	0	RO
8	8388618	UtilityInputCurrent1	The current, in Amps, being received by the UPS.	amperes (3)	0	RO
9	8388619	UtilityInputCurrent2	The current, in Amps, being received by the UPS.	amperes (3)	0	RO

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Index	BACnet ID	BACnet Name	Description	BACnet Units	COV Increment (default)	Access
10	8388620	UtilityInputCurrent3	The current, in Amps, being received by the UPS.	amperes (3)	0	RO
11	8388621	UtilityInputFrequency	The frequency in Hertz (Hz) of the voltage being received by the UPS.	hertz (27)	0	RO
12	8388622	OutputFrequency	The frequency in Hertz (Hz) of the output voltage.	hertz (27)	0	RO
13	8388623	OutputVoltage1	The AC voltage (VAC) that the UPS is supplying to its load.	volts (5)	0	RO
14	8388624	OutputVoltage2	The AC voltage (VAC) that the UPS is supplying to its load.	volts (5)	0	RO
15	8388625	OutputVoltage3	The AC voltage (VAC) that the UPS is supplying to its load.	volts (5)	0	RO
16	8388626	OutputVAPercentagePhase1	The UPS load as a percentage of available VA.	percent (98)	0	RO
17	8388627	OutputVAPercentagePhase2	The UPS load as a percentage of available VA.	percent (98)	0	RO
18	8388628	OutputVAPercentagePhase3	The UPS load as a percentage of available VA.	percent (98)	0	RO
19	8388629	OutputLoadCurrent1	The current, in Amps, supplied to the load.	amperes (3)	0	RO
20	8388630	OutputLoadCurrent2	The current, in Amps, supplied to the load.	amperes (3)	0	RO
21	8388631	OutputLoadCurrent3	The current, in Amps, supplied to the load.	amperes (3)	0	RO
22	8388632	OutputWattsPercentagePhase1	The UPS load as a percentage of available Watts.	percent (98)	0	RO
23	8388633	OutputWattsPercentagePhase2	The UPS load as a percentage of available Watts.	percent (98)	0	RO
24	8388634	OutputWattsPercentagePhase3	The UPS load as a percentage of available Watts.	percent (98)	0	RO
25	8388635	BypassInputFrequency	Measured frequency on the bypass input for separate bypass feed.	hertz (27)	0	RO

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Index	BACnet ID	BACnet Name	Description	BACnet Units	COV Increment (default)	Access
26	8388636	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	8388637	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
28	8388638	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	8388639	PositiveBatteryVoltage	Measured battery voltage - positive battery bus. Or the battery voltage if there is no negative bus.	volts (5)	0	RO
30	8388640	NegativeBatteryVoltage	Measured battery voltage - negative battery bus.	volts (5)	0	RO
31	8388641	BatteryStateOfCharge	The percentage of the UPS battery capacity that is available to support the attached equipment.	percent (98)	10	RO
32	8388642	PositiveBatteryCurrent	The current being battery positive	amperes (3)	0	RO
33	8388643	NegativeBatteryCurrent	The current being battery negative	amperes (3)	0	RO
34	8388644	OutputActivePowerL1	Measure the active power on the phase 1	kilowatt (48)	0	RO
35	8388645	OutputActivePowerL2	Measure the active power on the phase 2	kilowatt (48)	0	RO
36	8388646	OutputActivePowerL3	Measure the active power on the phase 3	kilowatt (48)	0	RO
37	8388647	OutputApparantPowerL1	Measure the apparent power on the phase 1	kilovolt-amperes (9)	0	RO
38	8388648	OutputApparantPowerL2	Measure the apparent power on the phase 2	kilovolt-amperes (9)	0	RO
39	8388649	OutputApparantPowerL3	Measure the apparent power on the phase 3	kilovolt-amperes (9)	0	RO

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Index	BACnet ID	BACnet Name	Description	BACnet Units	COV Increment (default)	Access
40	8388650	UPSapparentpowerrating	The rated apparent full power.	kilovolt-amperes (9)	0	RO
41	8388651	DCcapacitorMaintenanceCycle	Measure DC capacitor maintainance cycle period	days (70)	0	RO
42	8388652	ACcapacitorMaintenanceCycle	Measure AC capacitor maintainance cycle period	days (70)	0	RO
43	8388653	AuxPowerSupplyMaintenanceCycle	Measure the Aux PowerSupply Maintenance Cycle period	days (70)	0	RO
44	8388654	AirFilterMaintenanceCycle	Measure the Air filter maintenance cycle period	days (70)	0	RO
45	8388655	BatteryMaintenanceCycle	Measure the battery maintenance cycle period	days (70)	0	RO
46	8388656	WarrantyCycle	Measure the Warranty Cycle timeperiod	days (70)	0	RO
47	8388657	DCcapacitorRunningTime	Measure the DC capacitor running time	days (70)	0	RO
48	8388658	ACcapacitorRunningTime	Measure the AC capacitor running time	days (70)	0	RO
49	8388659	BatteryRunningTime	Measure the Air filter running time period	days (70)	0	RO
50	8388660	AmbientTemperature	Measure the Ambient temperature	degrees-Celsius (62)	0	RO
51	8388661	BypassInputVoltage1	The AC voltage (VAC) being received from Bypass Supply	volts (5)	0	RO
52	8388662	BypassInputVoltage2	The AC voltage (VAC) being received from Bypass Supply	volts (5)	0	RO
53	8388663	BypassInputVoltage3	The AC voltage (VAC) being received from Bypass Supply	volts (5)	0	RO
54	8388664	OutputVoltage12	The Phase12 AC voltage (VAC) that the UPS is supplying to its load.	volts (5)	0	RO
55	8388665	OutputVoltage23	The Phase23 AC voltage (VAC) that the UPS is supplying to its load.	volts (5)	0	RO

Index	BACnet ID	BACnet Name	Description	BACnet Units	COV Increment (default)	Access
56	8388666	OutputVoltage31	The Phase31 AC voltage (VAC) that the UPS is supplying to its load.	volts (5)	0	RO
57	8388667	AuxPowerSupplyRunningTime	Measure the Aux PowerSupply running time	months (68)	0	RO
58	8388610	AirFilterRunningTime	Measure the Aux PowerSupply running time	months (68)	0	RO
59	8388611	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:

- The BACnet ID is formed using the BACnet object type number (binary value is 5), and the index number.
- 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 ID	BACnet Name	Description	Alarm	Access
0	20971520	LostUPSComm	NMC lost comm with UPS	Yes	RO
1	20971521	Overload	The load exceeds 100% of rated capacity.	Yes	RO
2	20971522	SelfTestInProgress	UPS self-test in progress.	Yes	RO
3	20971523	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	20971524	OnBattery	On battery.	Yes	RO
5	20971525	InBypassBypassSwitch	In bypass in response to the bypass switch at the UPS	Yes	RO

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Index	BACnet ID	BACnet Name	Description	Alarm	Access
6	20971526	FanProblem	A base module fan not operating properly.	Yes	RO
7	20971527	BatteryChargerInoperable	A battery charger fault is inoperable.	Yes	RO
8	20971528	BatteryDisconnected	The battery is not installed properly.	Yes	RO
9	20971529	LostUPSCommOnBat	Lost the management interface-to-UPS communication while the UPS was on battery.	Yes	RO
10	20971530	UPSTempCritical	Rectifier over temperature	Yes	RO
11	20971531	OutputShortCircuit	The output has a short-circuit.	Yes	RO
12	20971532	InverterInoperable	An inverter is inoperable.	Yes	RO
13	20971533	BatteryNearEndOfLife	Battery near end of life. Order replacement battery.	Yes	RO
14	20971534	EPOActive	Emergency Power Off (EPO) active.	Yes	RO
15	20971535	WeakBattery	Weak battery exist.Battery replacement needed.	Yes	RO
16	20971536	PowerSavingMode	ECO Mode.	Yes	RO
17	20971537	InverterShutdownOverload	Inverter overload shutdown	Yes	RO
18	20971538	OverloadOnInstallation	Overload On Installation.	Yes	RO
19	20971539	NoMainPower	Main input is not available due to inoperable condition.	Yes	RO
20	20971540	RectifierFailure	Rectifier InOperable.	Yes	RO
21	20971541	InverterFault	Inverter Module InOperable.	Yes	RO
22	20971542	AuxPowerFault	Auxiliary Power Fault.	Yes	RO
23	20971543	InverterOverTemperature	Inverter Temperature Overload Exist	Yes	RO
24	20971544	InverterOverLoad	Inverter Over Load	Yes	RO

Index	BACnet ID	BACnet Name	Description	Alarm	Access
25	20971545	UPSOverLoad	UPS Over load	Yes	RO
26	20971546	InverterFailure	Inverter Module Failure	Yes	RO
27	20971547	InputFailure	Input Main Failure	Yes	RO
28	20971548	RectifierFault	Rectifier InOperable.	Yes	RO
29	20971549	LoadNotPowered	The output power is turned off	Yes	RO
30	20971550	BreakerQ2UOBOpen	Breaker Q2 UOB Open	Yes	RO
31	20971551	BypassOverTemperature	Bypass Over Temperature	Yes	RO
32	20971552	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:

- The BACnet ID is formed using the BACnet object type number (character string value is 40) and the index number.
- 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 ID	BACnet Name	Description	Access	Maximum Characters
0	167772160	UPSmodel	The UPS model name.	RO	24
1	167772161	UPSserialnumber	The UPS serial number.	RO	16
2	167772162	UPSfirmwareRevision	The revision number of the UPS firmware.	RO	16
3	167772163	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:

- The BACnet ID is formed using the BACnet object type number (multi-state value is 19) and the index number.
- 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 ID	BACnet Name	Description	Options	Access
0	79691770	Lastbatterytransfer	The cause of the last switch to battery operation. Excludes Self-Test.	None, Input Failure, UPS Battery Test	RO
1	79691771	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.

- The BACnet ID is formed using the BACnet object type number (notification class is 15) and the index number.

Index	BACnet ID	BACnet Name	Description	Access
0	62914560	DefaultNotifier	Default Notification Class	RW

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