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# EA660 G4 SNMP Card Communication Protocol

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1	Ver1.0	Initial version	Caolf	2020-9-18	
2	Ver1.1	Delete the content on TCP / IP Modbus protocol of SNMP card and integrate the deleted content into the Modbus protocol document	Zhang	2022-1-21	

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# SNMP Protocol (Simple Network Management Protocol)

## I. Relevant description of protocol

### 1. Application scope of protocol

This document is prepared to normalize the interface requirement of EA660 G4 UPS equipment for a SNMP card to provide SNMP protocol for network management node information by TCP/IP connection.

### 2. Introduction of SNMP protocol

Simple Network Management Protocol (SNMP), an application layer protocol, is a standard protocol specially designed to manage network nodes (servers, workstations, routers, switches, hubs, etc.) in IP network. Network administrators can manage network performance, identify and solve network problems, and plan network growth by the SNMP. The network management system detects the problems in the network by SNMP receiving random messages (and event reports).

The predecessor of SNMP is simple gateway monitoring protocol (SGMP), which is used to manage communication lines. Subsequently, major modifications are performed for the SGMP, especially adding SMI and MIB meeting the definition of Internet. The improved protocol is the famous SNMP. TCP / IP-based SNMP network management framework is the current standard in industry, and consists of three main parts: management information structure SMI, management information base MIB and management protocol SNMP, which are defined as follow:

- 1) SMI defines the organization and identification of the information used for SNMP framework, and provides templates for MIB to define management objects and use management objects.
- 2) MIB defines a set of management objects that can be accessed through SNMP.
- 3) SNMP is an application layer protocol, which defines how the network administrator reads and writes the MIB object of the agent process.

The MIB in SNMP is a tree database. The object managed by MIB is the end node of the tree. Unique location and unique name are allocated for each node, and IETF stipulates the unique designation of the management information base object identifier (OID), which is named by using the name of the parent node as the prefix of the name of the child node.

## II. Communication content and OID

See MIB Library (RFC1628\_UPS\_MIB.mib for OID accessible by this protocol and related communication information, as shown in the following table:

Data content	Node (OID)	Node name	Unit	Coefficient	Remarks
Battery status	1.3.6.1.2.1.33.1.2.1	upsBatteryStatus	/	1	1: Battery not connected 2: Battery OK 3: Battery under-voltage 4: Battery failure 5: Battery self-test 6: Even battery charging 7: Floating battery charging 8: Battery discharge 9: Battery connected Other failure
Total SOC	1.3.6.1.2.1.33.1.2.2	upsSecondsOnBattery	second	1	
Remaining SOC	1.3.6.1.2.1.33.1.2.3	upsEstimatedMinutesRemaining	branch	1	
Remaining battery capacity	1.3.6.1.2.1.33.1.2.4	upsEstimatedChargeRemaining	%	1	
Battery voltage	1.3.6.1.2.1.33.1.2.5	upsBatteryVoltage	V	0.1	
Battery current	1.3.6.1.2.1.33.1.2.6	upsBatteryCurrent	A	0.1	
Battery temperature	1.3.6.1.2.1.33.1.2.7	upsBatteryTemperature	℃	1	
Input phase number	1.3.6.1.2.1.33.1.3.2	upsInputNumLines	/	1	
Input voltage	1.3.6.1.2.1.33.1.3.3.1.3	upsInputVoltage	V	1	
Input current	1.3.6.1.2.1.33.1.3.3.1.4	upsInputCurrent	A	0.1	
Input frequency	1.3.6.1.2.1.33.1.3.3.1.2	upsInputFrequency	Hz	0.1	

Output power supply mode	1.3.6.1.2.1.33.1.4.1	upsOutputSource	/	1	3: Normal 4: Bypass 5: Battery Other failure
Output frequency	1.3.6.1.2.1.33.1.4.2	upsOutputFrequency	Hz	0.1	
Output phase number	1.3.6.1.2.1.33.1.4.3	upsOutputNumLines	/	1	
Output voltage	1.3.6.1.2.1.33.1.4.4.1.2	upsOutputVoltage	V	1	
Output current	1.3.6.1.2.1.33.1.4.4.1.3	upsOutputCurrent	A	0.1	
Output active power	1.3.6.1.2.1.33.1.4.4.1.4	upsOutputPower	W	1	
Load percentage	1.3.6.1.2.1.33.1.4.4.1.5	upsOutputPercentLoad	%	1	
Bypass frequency	1.3.6.1.2.1.33.1.5.1	upsBypassFrequency	Hz	0.1	
Bypass phase number	1.3.6.1.2.1.33.1.5.2	upsBypassNumLines	/	1	
Bypass voltage	1.3.6.1.2.1.33.1.5.3.1.2	upsBypassVoltage	V	1	
Bypass current	1.3.6.1.2.1.33.1.5.3.1.3	upsBypassCurrent	A	0.1	
Rated input voltage	1.3.6.1.2.1.33.1.9.1	upsConfigInputVoltage	V	1	
Rated input frequency	1.3.6.1.2.1.33.1.9.2	upsConfigInputFreq	Hz	0.1	
Rated output voltage	1.3.6.1.2.1.33.1.9.3	upsConfigOutputVoltage	V	1	
Rated output frequency	1.3.6.1.2.1.33.1.9.4	upsConfigOutputFreq	Hz	0.1	
Rated capacity	1.3.6.1.2.1.33.1.9.5	upsConfigOutputVA	W	1	
Manufacturer name	1.3.6.1.2.1.33.1.1.1	upsIdentManufacturer	/	/	
UPS model	1.3.6.1.2.1.33.1.1.2	upsIdentModel	/	/	
UPS software version	1.3.6.1.2.1.33.1.1.3	upsIdentUPSSoftwareVersion	/	/	
Description of UPS equipment	1.3.6.1.2.1.33.1.1.6	upsIdentAttachedDevices	/	/	
Communication failure	1.3.6.1.2.1.33.1.6.3.20	upsAlarmCommunicationsLost			1: Happened Between equipment and UPS
Battery damage	1.3.6.1.2.1.33.1.6.3.1	upsAlarmBatteryBad			1: Happened
Battery On	1.3.6.1.2.1.33.1.6.3.2	upsAlarmOnBattery			1: Happened
Battery under-voltage	1.3.6.1.2.1.33.1.6.3.3	upsAlarmLowBattery			1: Happened
Depleted battery	1.3.6.1.2.1.33.1.6.3.4	upsAlarmDepletedBattery			1: Happened

Over-temperature of UPS	1.3.6.1.2.1.33.1.6.3.5	upsAlarmTempBad			1: Happened
Input (mains) failure	1.3.6.1.2.1.33.1.6.3.6	upsAlarmInputBad			1: Happened
Output failure	1.3.6.1.2.1.33.1.6.3.7	upsAlarmOutputBad			1: Happened
Output overload	1.3.6.1.2.1.33.1.6.3.8	upsAlarm OutputOverload			1: Happened
Bypass supply	1.3.6.1.2.1.33.1.6.3.9	upsAlarmOnBypass			1: Happened
Bypass failure	1.3.6.1.2.1.33.1.6.3.10	upsAlarmBypassBad			1: Happened
Execute output closure command	1.3.6.1.2.1.33.1.6.3.11	upsAlarmOutputOff AsRequested			1: Happened
Execute shutdown command	1.3.6.1.2.1.33.1.6.3.12	upsAlarm UpsOffAsRequested			1: Happened
Charging module failure	1.3.6.1.2.1.33.1.6.3.13	upsAlarm ChargerFailed			1: Happened
UPS output off	1.3.6.1.2.1.33.1.6.3.14	upsAlarm UpsOutputOff			1: Happened
UPS shutdown	1.3.6.1.2.1.33.1.6.3.15	upsAlarm UpsSystemOff			1: Happened
Fan failure	1.3.6.1.2.1.33.1.6.3.16	upsAlarmFanFailure			1: Happened
Fuse failure	1.3.6.1.2.1.33.1.6.3.17	upsAlarm FuseFailure			1: Happened
UPS failure	1.3.6.1.2.1.33.1.6.3.18	upsAlarm GeneralFault			1: Happened
Battery test 10s	1.3.6.1.2.1.33.1.7.7.4	upsTest QuickBatteryTest			Valid written 0xFFFF. Return 10s after the test. If the battery voltage is low during the test, the system will immediately return to the initial state.
Battery under-voltage test	1.3.6.1.2.1.33.1.7.7.5	upsTestDeepBatteryCalibration			Valid written 0xFFFF. The system performs the test until the power is supplied by the inverter due to

					battery under-voltage.
Buzzer switch	1.3.6.1.2.1.33.1.9.8	upsConfig AudibleStatus			Valid written 0xFFFF. When the UPS system gives an alarm, the alarm tone can be turned on or cancelled.
Cancel test command	1.3.6.1.2.1.33.1.7.7.2	upsTestAbort TestInProgress			Valid written 0xFFFF. All tests are cancelled, and the system will immediately recover the output state.