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Application Note – AMPS SNMP Monitoring

For Alpha AMPS Multi-Mode UPS Systems

Overview

The standard MIB within the Alpha Cordex controller contains many signals and alarms which can be accessed via a remote SNMP agent. The Cordex controller provides centralized monitoring and control for a variety of Alpha power electronics and digital peripheral devices across thousands of potential system configurations. This document will provide guidance to users commissioning an SNMP based monitoring system tailored for Alpha AMPS UPS support.

System Components and SNMP Access

Inverters

The Alpha Inverter Modules (AIM) installed in AMPS systems hold the majority of alarm and signal information relevant to a multi-mode UPS monitoring solution.

Individual module view: Each individual inverter module alarm and signal information can be polled using an OID address as well as an instance number, where the instance number equals the inverter module number as assigned in the system.

Group view: Inverter modules can be assigned into groups. “AC groups” are typically defined to separate individual 120Vac modules in split or three phase system implementations. “DC groups” can also be defined for systems with multiple battery inputs. Group-level alarms and signals can be

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accessed via their own unique OID addresses with an instance number corresponding to the group number as assigned in the system.

System view: Several system level alarms are available via a fixed OID and instance number. Total system-level power monitoring however requires the SNMP agent to actively sum the readings from all installed inverter modules.

For example:

Total AC Power Out = Sum of ALL inverter modules Power Output

Total AC Input Current = Sum of ALL inverter modules Current Input

Rectifier Alarms

The Cordex rectifier modules (CXR) installed are used primarily for battery charging. Rectifier specific alarms and signal data are accessible via fixed OID addresses and instance numbers.

System Alarms

There are also UPS system level alarms accessible via SNMP (e.g., Bypass alarm, TVSS, etc). These alarms are accessible via fixed OID addresses and instance numbers.

System Level SNMP Monitoring

The system level dashboard view is intended to be the primary monitoring screen for AMPS UPS systems. The exact screen layout and content should take into account user requirements and also may be influenced by any SNMP agent system limitations.

Below are recommended values to display for a system level monitoring view including OID addresses, instance numbers, and details on what each value represents.

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System Power Information

	Item Name	OID	Instance	Description
System Output				
	Total kVA Output	Sum of all module kVA output (1.3.6.1.4.1.7309.10.5.5.1.13)	†	Total system output (kVA)
	Total kW Output	Sum of all module W output (1.3.6.1.4.1.7309.10.5.5.1.12) / 1000	†	Total system output (kW)
	Total Current Output	Sum of all module current output (1.3.6.1.4.1.7309.10.5.5.1.11)	†	Total system AC current output (A)
	Voltage Output	Avg of all module output voltage (1.3.6.1.4.1.7309.10.5.5.1.10)	†	System voltage output
	System VA Load %	Avg of all module VA load % (1.3.6.1.4.1.7309.10.5.5.1.8)	†	% of System VA Output (Actual vs Nom rating)
System Input				
	Total AC kVA Input	Sum of all module kVA input (1.3.6.1.4.1.7309.10.5.5.1.17)	†	Total system AC input (kVA)
	Total AC kW Input	Sum of all module W input (1.3.6.1.4.1.7309.10.5.5.1.16) / 1000	†	Total system AC input (kW)
	Total AC Current Input	Sum of all module current input (1.3.6.1.4.1.7309.10.5.5.1.15)	†	Total system AC current input (A)
	AC Voltage Input	Avg of all module input voltage (1.3.6.1.4.1.7309.10.5.5.1.14)	†	System AC voltage input
	AC Source %	1.3.6.1.4.1.7309.4.1.6.4.2.1.3	2	% of Input to inverters which is AC fed (vs DC)
	Total DC kW Input	Sum of all module DC W input (1.3.6.1.4.1.7309.10.5.5.1.21) / 1000	†	Total system DC input (kW)
	Total DC Current Input	Sum of all module DC current input (1.3.6.1.4.1.7309.10.5.5.1.20)	†	Total system DC current input (A)
	DC Voltage Input	Avg of all module DC input voltage (1.3.6.1.4.1.7309.10.5.5.1.19)	†	System DC voltage input

† - Instance # = CXC assigned number of inverter

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Battery				
	Battery Voltage	1.3.6.1.4.1.7309.4.1.6.2.2.1.3	3	Battery Voltage (V)
	Rectifier Output Current	1.3.6.1.4.1.7309.4.1.6.3.2.1.3	1	Total rectifier output current (A)

System Alarm Information

	Item Name	OID	Instance	Description
System Alarm				
	Bypass Mode On	1.3.6.1.4.1.7309.4.1.5.2.2.1.3	1	UPS Alarm
	TVSS	1.3.6.1.4.1.7309.4.1.5.2.2.1.3	3	UPS Alarm
Inverter Status				
	Number of Inverters	1.3.6.1.4.1.7309.4.1.6.4.2.1.3	5	Qty inverters installed
	Number of Failed Inverters	1.3.6.1.4.1.7309.4.1.6.4.2.1.3	9	Qty inverters failed
	Inverter AC Input Fail	1.3.6.1.4.1.7309.4.1.5.12.2.1.3	4	Inverter Alarm
	Inverter Alarm	1.3.6.1.4.1.7309.4.1.5.12.2.1.3	5	Inverter Alarm
	Inverter Comms Lost	1.3.6.1.4.1.7309.4.1.5.12.2.1.3	3	Inverter Alarm
	Inverter Input Breaker Off	1.3.6.1.4.1.7309.4.1.5.2.2.1.3	4	Inverter Alarm
	Inverter Output Breaker Off	1.3.6.1.4.1.7309.4.1.5.2.2.1.3	2	Inverter Alarm
	Inverter Major Fail Count	1.3.6.1.4.1.7309.4.1.5.12.2.1.3	1	Inverter Alarm
	Inverter Minor Fail Count	1.3.6.1.4.1.7309.4.1.5.12.2.1.3	2	Inverter Alarm

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Rectifier Status

	Number Acquired Rectifiers	1.3.6.1.4.1.7309.4.1.6.3.2.1.3	4	Qty of system acquired rectifiers
	Number Failed Rectifiers	1.3.6.1.4.1.7309.4.1.6.3.2.1.3	6	Qty of failed rectifiers
	High DC Voltage	1.3.6.1.4.1.7309.4.1.5.4.2.1.3	3	Rectifier Alarm
	Very High DC Voltage	1.3.6.1.4.1.7309.4.1.5.4.2.1.3	4	Rectifier Alarm
	Low DC Voltage	1.3.6.1.4.1.7309.4.1.5.4.2.1.3	5	Rectifier Alarm
	Very Low DC Voltage	1.3.6.1.4.1.7309.4.1.5.4.2.1.3	6	Rectifier Alarm
	Rectifier Major Fail Count	1.3.6.1.4.1.7309.4.1.5.1.2.1.3	3	Rectifier Alarm
	Rectifier Minor Fail Count	1.3.6.1.4.1.7309.4.1.5.1.2.1.3	4	Rectifier Alarm
	Rect AC Mains Fail	1.3.6.1.4.1.7309.4.1.5.1.2.1.3	9	Rectifier Alarm
	Rect Comms Lost	1.3.6.1.4.1.7309.4.1.5.1.2.1.3	7	Rectifier Alarm
	Fan Fail Alarm	1.3.6.1.4.1.7309.4.1.5.1.2.1.3	11	Rectifier Alarm
	Out of Tolerance	1.3.6.1.4.1.7309.4.1.5.1.2.1.3	6	Rectifier Alarm

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Inverter Module and Group Views

Several SNMP management systems allow the user to drill into specific alarm and signal data at an individual inverter module or group view. Individual or group views can provide additional levels of valuable information such as determining group phase loading. Below are recommended values to display for inverter module and group level monitoring view including OID addresses, instance numbers, and details on what each value represents.

Inverter Module View

	Item Name	OID	Instance	Description
Module View (AC Input)				
	AC Current Input	1.3.6.1.4.1.7309.10.5.5.1.15	†	Input current (A) / module
	AC Frequency Input	1.3.6.1.4.1.7309.10.5.5.1.18	†	Input frequency (Hz) / module
	AC Voltage Input	1.3.6.1.4.1.7309.10.5.5.1.14	†	Input voltage (V) / module
	AC VA Input	1.3.6.1.4.1.7309.10.5.5.1.17	†	Input apparent power (VA) / module
	AC W Input	1.3.6.1.4.1.7309.10.5.5.1.16	†	Input power (W) / module
Module View (AC Output)				
	AC Current Output	1.3.6.1.4.1.7309.10.5.5.1.11	†	Output current (A) per module
	AC Voltage Output	1.3.6.1.4.1.7309.10.5.5.1.10	†	Output voltage (V) per module
	AC VA Output	1.3.6.1.4.1.7309.10.5.5.1.13	†	Output apparent power (VA) / module
	AC VA Load Ratio	1.3.6.1.4.1.7309.10.5.5.1.8	†	% of VA Output (Actual vs Nominal rating)
	AC W Output	1.3.6.1.4.1.7309.10.5.5.1.12	†	Output Power (W) / module
	AC W Load Ratio	1.3.6.1.4.1.7309.10.5.5.1.7	†	% of Watt Output (Actual vs Nominal rating)
Module View (DC Input)				
	DC Current Input	1.3.6.1.4.1.7309.10.5.5.1.20	†	DC input current (A) / module
	DC Voltage Input	1.3.6.1.4.1.7309.10.5.5.1.19	†	DC input voltage (V) / module

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DC W Input	1.3.6.1.4.1.7309.10.5.5.1.21	†	DC input power (W) / module
Module Group Assignment			
AC Group	1.3.6.1.4.1.7309.10.5.5.1.30	†	AC "Group" # the module is assigned to
DC Group	1.3.6.1.4.1.7309.10.5.5.1.31	†	DC "Group" # the module is assigned to
Alarm Status			
AC Status	1.3.6.1.4.1.7309.10.5.5.1.27	†	See "ref" tab for alarm code definition
DC Status	1.3.6.1.4.1.7309.10.5.5.1.28	†	See "ref" tab for alarm code definition

† - Instance # = CXC assigned number of inverter

Inverter Group View

Item Name	OID	Instance	Description
Group View (AC Input)			
AC Current Input	1.3.6.1.4.1.7309.10.7.5.1.9	††	Input current (A) / group
AC Frequency Input	1.3.6.1.4.1.7309.10.7.5.1.10	††	Input frequency (Hz) / group
AC Voltage Input	1.3.6.1.4.1.7309.10.7.5.1.8	††	Input voltage (V) / group
AC VA Input	1.3.6.1.4.1.7309.10.7.5.1.7	††	Input apparent power (VA) / group
AC W Input	1.3.6.1.4.1.7309.10.7.5.1.6	††	Input power (W) / group
Group View (AC Output)			
AC Current Output	1.3.6.1.4.1.7309.10.6.5.1.7	††	Output current (A) / group
AC Frequency Output	1.3.6.1.4.1.7309.10.6.5.1.10	††	Output frequency (Hz) / group
AC Voltage Output	1.3.6.1.4.1.7309.10.6.5.1.6	††	Output voltage (V) / group
Group View (DC Input)			
DC Current Input	1.3.6.1.4.1.7309.10.8.5.1.8	††	DC input current (A) / group
DC Voltage Input	1.3.6.1.4.1.7309.10.8.5.1.7	††	DC input voltage (V) / group
DC W Input	1.3.6.1.4.1.7309.10.8.5.1.6	††	DC input power (W) / group

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