The Guaranteed Network

Closer to you, Further into the future.

AX Series Power Saving Guide

Edition 3

Document No. NTS-11-R-004

ALAXALA Networks Corporation

Preface

The recent approach toward power saving being thoroughly spread throughout all of society is also required for IT equipment. ALAXALA has been attaching importance to environmental measures since it was established and has been leading the industry in the energy saving of network equipment. This document describes the abundant power saving functionality that the AX series supports and how to set these functionalities. The purpose of this document is to contribute to power saving by operating the AX series properly.

Related documents

- AX Series Dynamic Power Saving Functionality Application Guide
- AX Series Product Manual (http://www.alaxala.com/en/techinfo/manual/index.html)

Instructions for using this document

The information on the power consumption or performance described in this document stems from the results obtained when the information is executed in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions. Understand that this document helps you take measures for power saving while using our products.
The OS software versions used during the creation of this document are as described below unless otherwise specified.

AX6700S/AX6600S/AX6300S series	Ver. 11.9
AX3800S, AX3600S series	Ver. 11.9
AX2530S series	Ver. 3.3.A
AX2230S/AX1250S/AX1240S series	Ver. 2.4

For the sake of improvement, the contents of this document may be subject to change without prior notice.

Export restrictions

In the event that any or all ALAXALA products (including technologies, programs and services) described or contained herein are controlled under any of applicable export control laws and regulations (including the Foreign Exchange and Foreign Trade Law of Japan and United States export control laws and regulations), such products shall not be exported without obtaining the required export licenses from the authorities concerned in accordance with the above laws.

Conventions: The terms "Switch" and "switch"

The term Switch (upper-case "S") is an abbreviation for any or all of the AX series switches:
The term switch (lower-case "s") might refer to a Switch, another type of switch from the current vendor, or a switch from another vendor. The context decides the meaning

Trademarks

- The ALAXALA name and logo are the trademarks or registered trademarks of ALAXALA Networks Corporation.
- Ethernet is a trade name of Xerox Corporation in the U.S.
- Other company and product names in this manual are trademarks or registered trademarks of their respective owners.

Notations in this document

BCU Basic Control Unit
The BCU is home to the CPU. It manages the entire device, processes a spanning tree protocol and routing protocol, and controls the BSU and NIF. The BCU is installed in the AX6700S series.

BSU Basic Switching Unit
Using the installed transfer engine, the BSU switches packets to the NIF according to the MAC address table or routing table. It is installed in the AX6700S series.

CSU Control and Switching Unit
The CSU consists of a CPU block and a PSP block. It is installed in the AX6600S series.

MSU Management and Switching Unit
The MSU consists of a CPU block and a PSP block. It is installed in the AX6300S series.

NIF Network Interface
The NIF is an interface control block compatible with various media. There are NIFs of multiple types. The NIF processes a physical layer.

PSP Packet Switching Processor
PSP switches packets in the CSU and MSU.

Revision history

Edition	Rev.	Date	Description	Applicable sections
Edition 1	-	June 6, 2011	First edition	-
Edition 2	-	January 11, 2012	Added AX2530S-24T4X and AX2530S-48T2X.	2.5, 3.1
			Added AX3830S-44XW of the AX3800S series.	1.2(2), 2.3, 3.2(2) Appendix A.2
Edition 3	-	September 28, 2012	Added AX2230S-24T and AX2230S-24P of the AX2200S series.	1.2(2), 2.5, 3.1, Appendix A.4
			Added AX3830S-44X4QW.	2.3, 3.2(2)

Contents

1. Approach toward Power Saving by ALAXALA Products

1.1 Overview

At present, the efforts toward power saving that have spread throughout society have been also become required for IT equipment. Especially for networks, non-stop operating environments have become the norm, and the power consumption of entire systems has been increasing with the rapid increase in communication traffic.

ALAXALA has been attaching importance to taking action to protect the environment and has been promoting *network energy saving* since the company was established. As a result, numerous power saving functions are provided with the AX series.

In general, power-saving measures can be roughly classified into three methods.

- Cutting wasted power: Turning off power to unused parts
- Power saving by green operation: Operating only the minimum parts required and stopping the remaining parts
- Introduction of green products: Changing current products to new products which take power saving into consideration

Cases where these methods are applied to a network are shown in Table 1.1-1

Table 1.1-1 Measures for power saving in networks

Power saving measures	Measures for power saving in networks
Cutting wasted power	- Stop the wasted power consumption of network equipment
Power saving by green operation	- Review the network environment and reduce power consumption while maintaining the minimum performance required
Introduction of green products	- Introduce new products that conform to energy-saving design and energy saving-related laws - Introduce products with a high allowable operating temperature, raise the air conditioning temperature, and reduce the power consumption of air conditioning equipment.

In this document, an outline of the power saving functions that achieve *wasted power cutting* and *power saving by green operation* in the AX series are described in section *1.2*, and the operation methods are described in section *1.3*. Configuration setting examples are shown in Chapter *2*. Also, the results of measurements taken of power consumption in the AX series are shown in Chapter *3*.

1.2 Power saving functionality of the AX series

The lists of power saving functionality supported by the AX series are shown in (1) Chassis-type switch and (2) Box-type switch.
In order to execute and cancel a power saving functionality, the following methods are available: full-time execution that is manually and fixedly set, and automatic control that is based on scheduled settings or traffic amounts. The full-time execution, the automatic control based on the scheduled settings, and the automatic control based on the traffic amount are described in section *1.3*.

(1) Chassis-type switch

Table 1.2-1 List of power saving functions supported using the chassis-type switch

Power-saving measures	Power-saving functionality	Applicable series and operation method#1	
		AX6700S AX6600S	AX6300S
Cutting wasted power	Unused port power feed OFF functionality	**R S**	**R**
	Unused NIF power feed OFF functionality	**R S**	**R**
	Standby switch unit power feed OFF functionality (cold standby)	**R S T**	--
	Standby NIF power feed OFF functionality (cold standby)	**R S**	--
	LED OFF functionality	**R S T**	**R**
Green operation	Switching to the power saving mode using online	**R S T**	--

#1 Legend R: Supports full-time execution
S: Supports automatic control based on scheduled settings
T: Supports automatic control based on the amount of traffic
--: Not supported

The power saving functions supported by the AX series using a chassis-type switch are outlined in (1-1) to (1-6) below.

(1-1) Unused port power feed OFF functionality [AX6700S, AX6600S, and AX6300S]

This functionality can reduce power consumption by stopping the power supply to unused ports.
(Notation in manual: Port power supply OFF)

(1-2) Unused NIF power feed OFF functionality [AX6700S, AX6600S, and AX6300S]

This functionality can reduce power consumption by stopping the power supply to unused NIFs.
(Notation in manual: NIF power supply OFF)

(1-3) Standby switch unit power feed OFF functionality (cold standby) [AX6700S and AX6600S]

This functionality can reduce power consumption by stopping the power supply to a standby unit among the redundant switch units.
When a failure occurs in an active switch unit, a standby switch unit is automatically started and switched to the operating status (cold standby). System switching is accompanied with the start of a standby switch unit, which requires time.
This functionality can be executed during redundancy of the BSU (AX6700S series) and the CSU (AX6600S series).
(Notation in manual: Standby BSU/PSP power supply OFF)

(1-4) Standby NIF power feed OFF functionality (cold standby) [AX6700S and AX6600S]

This functionality can reduce power consumption by stopping the power supply to a standby NIF among the redundant NIFs.
When a failure occurs in an active NIF and port, a standby NIF is automatically started for system switching (cold standby).
(Notation in manual: Standby NIF power supply OFF)

(1-5) LED OFF functionality [AX6700S, AX6600S, and AX6300S]

This functionality can turn off all the LEDs of a NIF port.
Even if the LED of a NIF port is set so that it goes off, it lights up by using the operation key on the system operation panel. The operating status of a port can be confirmed in this case. The LED that was turned on goes off 60 seconds after a key operation.
(Notation in manual: NIF port LED OFF)

(1-6) Switching to power saving mode when online [AX6700S and AX6600S]

This is a functionality for switching to the power saving mode when switching between normal power mode and power saving mode online without interrupting communication. The power saving mode can lower the internal operating clock frequency to reduce power consumption. This power mode is displayed with the SYSTEM2 LED of a device turned off in normal power mode, with the LED turned on and off in green during power mode switching, and with the LED turned on in green in power saving mode.
This functionality can be executed during redundancy of the BSU (AX6700S series) and the CSU (AX6600S series).
(Notation in manual: BSU and PSP power controls)

(2) Box-type switch

Table 1.2-2 List of power saving functionality supported using the box-type switch

Power saving measures	Power saving functionality		Applicable series and operation method[#1]									
			AX3830S AX3650S		AX3640S		AX2500S		AX2200S		AX1250S AX1240S	
Cutting wasted power	Unused port power feed OFF functionality		R	S	R	S	R	S	R	S	R	S
	Link-down port power saving functionality		R	S	--		R	S	R	S	R	S
	Sleep functionality	OFF/ON by designating a time range		S	--			S	--			S
		Restoration option based on detecting reception of WOL a packet	--		--			S	--		--	
		Restoration option based on port link-up detection	--		--			S	--		--	
	LED luminance setting functionality	Fixed	R	S	--		R	S	R	S	R	S
		Automatically changed	R	S	--		R	S	R	S	R	S
	Semi-fanless functionality[#2]		--		--		R		--		R	

#1 Legend R: Supports full-time execution
S: Supports automatic control based on scheduled settings
--: Not supported

#2 The semi-fanless functionality is supported by the AX2530S-48T and AX1240S-48T2C.

The power saving functions supported by the AX series box-type switches are outlined in (2-1) to (2-5) below.

(2-1) Unused port power feed OFF functionality

[AX3830S, AX3600S, AX2500S, AX2200S, AX1250S, and AX1240S]

This functionality can reduce power consumption by stopping the power supply to unused ports.
(Notation in manual: Port power supply OFF and port blocked)

(2-2) Link-down port power saving functionality

[AX3830S, AX3650S, AX2500S, AX2200S, AX1250S, and AX1240S]

This functionality reduces the power consumption of link-down ports.
An optical port is not treated as an unused port which uses the power saving functionality.
(Notation in manual: Link-down port power saving functionality)

(2-3) Sleep functionality [AX3830S, AX3650S, AX2500S, AX1250S, and AX1240S]

This functionality reduces power consumption significantly by putting the Switch into a sleep state for a scheduled time range. The PWR LED blinks in green for a long time while the device is in the sleep state. All switching functions or remote access functions stop in this case. The sleep state is canceled to start the device when the scheduled time range is completed.
(Notation in manual: Device sleep functionality)

AX2500S supports restoration options based on WOL packet reception detection and port link-up detection, which can restore this Switch remotely from the sleep state.

1. Restoration option based on WOL packet reception detection [AX2500S]
   The sleep state is automatically canceled to start the system when WOL packet reception is detected on the specified port in the sleep state.

2. Restoration option based on port link-up detection [AX2500S]
   The device is put into a sleep state when link-down is detected on all specified ports in the scheduled time range. The sleep state is automatically canceled to start the system when link-up is detected on any of the specified ports.

(2-4) LED luminance setting functionality

[AX3830S, AX3650S, AX2500S, AX2200S, AX1250S, and AX1240S]

Through configuration, this functionality can set the luminance of the LEDs to normal luminance, darkening, or OFF. It can also set the timing of automatic operation through configuration and can select the setting for changing the three-level luminance automatically.
(Notation in manual: LED luminance control functionality and LED luminance setting)

(2-5) Semi-fanless functionality [AX2530S-48T and AX1240S-48T2C]

This functionality monitors whether the temperature in the installation environment is properly set by monitoring the temperature of the device. The fan can stop to reduce power consumption when the forced cooling of a device is judged to be unnecessary.
(Notation in manual: Cooling fan control functionality and semi-fanless operation)

1.3 Operation of the AX series power saving functionality

The power saving functionality of the AX series enables fixed and dynamic operation (automatic control for execution and cancelation). Moreover, *Automatic control based on scheduled settings* and *Automatic control based on traffic amount* are available as automatic control.

The power saving schemes to be applied vary depending on how you control the execution and cancelation of the power saving functionality. Therefore, select a proper scheme. The examples of the corresponding power saving schemes are shown in Table *1.3-1*. The images to be applied are shown in Figure *1.3-1* to Figure *1.3-3*.

Table 1.3-1 Operation of power saving functionality and examples of corresponding power saving schemes

Operation		Control of power saving functionality execution and cancelation	Example of corresponding power saving scheme
Full-time execution of the power saving functionality		Executes a power saving functionality in a fixed way	− Shut down unused ports to save power. − To save power, set a standby module to the cold standby state or set a standby device to the sleep state (Figure *1.3-1*). − Execute a power saving functionality other than one in the automatic control conditions with the automatic control set (Figure *1.3-2b*).
Automatic control of the power saving functionality through execution and cancelation	Automatic control based on scheduled settings	Controls the execution and cancelation of the power saving functionality automatically during the specified time of the specified date (or day of the week)	− Save power during a set time range, such as midnight or on holidays, in which a decrease in traffic amount is expected beforehand (Figure *1.3-2a*). − Specify the time range for when the power consumption is to be reduced and reduce the peak power of all the equipment (Figure *1.3-2b*).
	Automatic control based on traffic amount[#1]	Executes a power saving functionality automatically when traffic amount decreases continuously; cancels it automatically when traffic amount increases continuously	− Save power even when the time range in which traffic decreases cannot be determined (Figure *1.3-3*).

#1 The automatic control based on traffic amount is supported only in AX6700S and AX6600S.

The full-time execution of a power saving functionality can be used in combination with *Automatic control based on scheduled settings* or *Automatic control based on traffic amount*. During the execution of a power saving functionality by automatic control, the power saving functionality specified for automatic control takes priority. *Automatic control based on scheduled settings* and *Automatic control based on traffic amount* cannot be used together.

After that, the time range in which the schedule of a power saving functionality is set is called the *scheduled time range*. The time range in which no schedule is set and in which the automatic control based on traffic amount is not performed is called a *normal time range*.

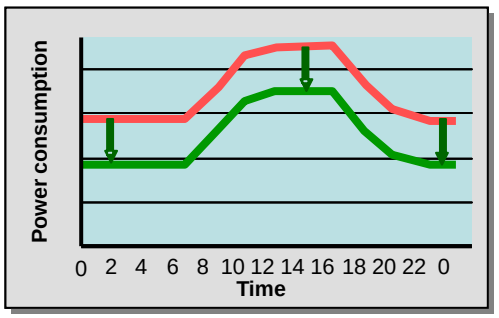

Figure 1.3-1 Execution of fixed power saving functionality

Figure *1.3-1* shows operation when executing a power saving functionality in a fixed way and for turning off the power of an unused part at all times.

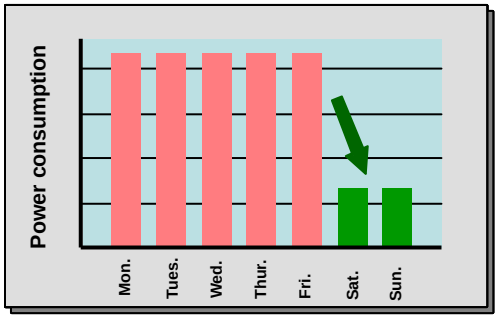

Figure 1.3-2a Automatic control based on scheduled settings

Figure *1.3-2a* shows operation when specifying the time range in which a power saving functionality is executed, on Saturday and Sunday, by the automatic control based on the scheduled settings and by automatically controlling the execution and cancelation of a power saving functionality.

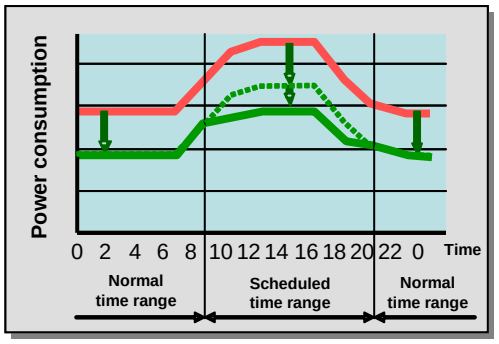

Figure 1.3-2b Combined use of fixed power saving functionality execution and automatic control based on scheduled settings

Figure *1.3-2b* shows a case where the execution of a fixed power saving functionality is combined with the automatic control based on scheduled settings. It shows operation when specifying 9:00 a.m. to 9:00 p.m. as the scheduled time and is controlling the execution and cancelation of the power saving functionality automatically.

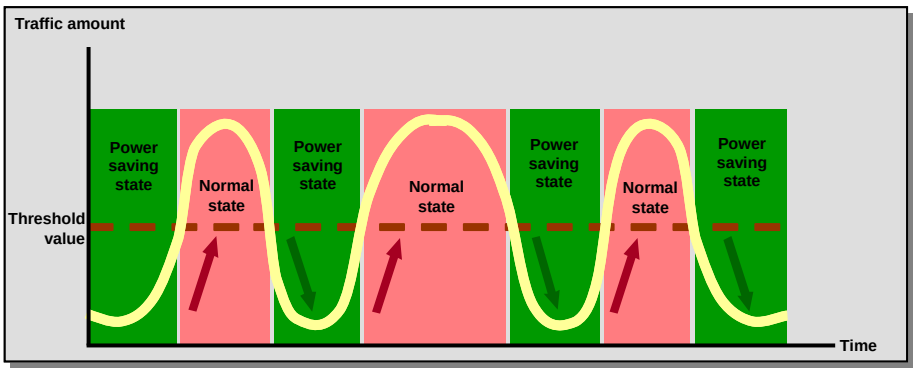

Figure 1.3-3 Automatic control based on traffic amount

Figure *1.3-3* shows a case where a power saving functionality is automatically executed due to the decrease in traffic amount through the automatic control based on the traffic amount and where it is automatically canceled due to the increase in traffic amount.

2. Power Saving Settings in the AX Series

2.1 Preparation for power saving settings

In setting the configuration of power saving measures, pay attention to the following:

- Plan the power saving functionality used and its operation through preparation after referring to Table *1.2-1* and *Table 1.2-2*.

  Automatic control based on scheduled settings cannot be used jointly with *Automatic control based on traffic amount*.
  In *Automatic control based on traffic amount*, the traffic amount is large at all times. Therefore, a power saving functionality may not be executed depending on the operating conditions.

- When *Automatic control based on scheduled settings* is used

  Specify a command that states a scheduled time range and a command that specifies the operation of a power saving functionality in a scheduled time range.

- When *Automatic control based on traffic amount* is used

  Specify a command that validates *Automatic control based on traffic amount* and a command that specifies the operation of the power saving functionality to be executed due to the decrease in traffic.

- When *Automatic control based on scheduled settings* or *Automatic control based on traffic* amount is used

  Set the execution or cancelation of all power saving functionality that support the automatic control to be used.

  A power saving functionality operates based on the default setting of each command when a configuration setting command is omitted.
  To prevent a device from not operating as expected, set all corresponding power saving functionality explicitly when using automatic control.
  The operation of each command when set to default settings is shown in *Appendix A*.

The configuration setting examples of power saving functions in each series are given in sections *2.2* to *2.6*.

Change the italics in the "Configuration setting example" field appropriately according to the actual system state.

The difference in the power consumption level when the relevant power saving functionality is executed and when it is not executed is shown in the "Rough standard of the power saving effect" field. It is a standard value based on the results of measurements obtained in the verification environment of our company under specific conditions. The result is not guaranteed under all conditions. Use the value as a reference value when testing the execution of a power saving functionality.

A list of section numbers and functions is shown below.

2.2 Power saving settings for the AX6700S, AX6600S, and AX6300S series

Configuration setting examples of the power saving functions for the AX6700S, AX6600S, and AX6300S series are given below.

AX6700S AX6600S AX6300S

2.2.1	Cutting wasted power	Unused port power feed OFF functionality
Overview	The power supply of the unused port is set to OFF.	
Applicable models	**AX6700S**, **AX6600S**, **AX6300S series**	
Configuration setting examples	For the full-time execution of power saving functionality (R)	
	(config)# interface *gigabitethernet 3/24* **(config-if)# shutdown**	- Shifted to the **config-if** mode. - Turns off the power of the port by setting a port to the shutdown state.
	For automatic control based on scheduled settings (S)	
	(config)# schedule-power-control shutdown interface *gigabitethernet 1/24*	- Turns off the power of the port by setting a port to the shutdown state during a scheduled time range.
Rough standard of power saving effects	A rough standard of the power saving effect per port is as follows: A 10GBASE-SR XFP-SR transceiver is used: 1.0 (W) A 1000BASE-SX SFP-SX transceiver is used: 0.1 (W) 1000BASE-T:0.9 (W)	
Notes	- In the AX6300S series, the automatic control based on scheduled settings is not supported.	
Supplementary items		
Related documents	AX6700S/AX6600S/AX6300S Software Manual Configuration Guide Vol.1	

AX6700S AX6600S AX6300S

2.2.2	Cutting wasted power	Unused NIF power feed OFF functionality
Overview	The power supply of unused NIFs is set to OFF.	
Applicable models	**AX6700S, AX6600S, AX6300S series**	
Configuration setting examples	For the full-time execution of power saving functionality (R)	
	(config)# no power enable nif *4*	- Turns off the power of the NIF by setting it to the disabled state.
	For automatic control based on scheduled settings (S)	
	(config)# schedule-power-control shutdown nif *4*	- Turns off the power of the NIF by setting it to the disabled state during a scheduled time range.
Rough standard of power saving effects	A rough standard of a power saving effects per main NIF is as follows:	

AX6700S□

Type of NIF	Standard of power saving effect
NK1G-24T	97 (W)
NK1G-24S	80 (W)
NK10G-4RX	83 (W)
NK10G-8RX	100 (W)

□AX6600S

Type of NIF	Standard of power saving effect
NK1G-24T	84 (W)
NK1G-24S	68 (W)
NK10G-4RX	71 (W)
NK10G-8RX	88 (W)□

AX6300S

Type of NIF	Standard of power saving effect
NH1G-24T	84 (W)
NH1G-24S	67 (W)
NH10G-1RX	17 (W)
NH10G-4RX	72 (W)

Notes	- In the AX6300S series, the automatic control based on scheduled settings is not supported.
Supplementary item	
Related document	AX6700S/AX6600S/AX6300S Software Manual Configuration Guide Vol.1

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX6700S AX6600S

2.2.3	Cutting wasted power	Standby switch unit power feed OFF functionality
Overview	The power supply of the standby BSU/PSP is set to OFF.	
Applicable models	**AX6700S, AX6600S series**	
Configuration setting examples	For the full-time execution of power saving functionality (R)	

	`(config)# redundancy {max-bsu | max-psp} 1`
	
	`(config)# redundancy {standby-bsu | standby-psp} cold2`
		- The AX6700S series is `max-bsu`, and the AX6600S series is `max-psp`.
		The example on the left shows when the number of active BSUs/PSPs is set to 1. If the number of installed BSUs/PSPs is 2, the device operates on the assumption that the number of active BSUs/PSPs is 1 and that the number of standby BSUs/PSPs is 1.
		- AX6700S is `standby-bsu`, and AX6600S is `standby-psp`.
		Sets the power supply of the standby BSU/PSP to OFF.

	For automatic control based on scheduled settings (S)	

	`(config)# schedule-power-control {max-bsu | max-psp} 1`
	
	`(config)# schedule-power-control {standby-bsu | standby-psp} cold2`
		- AX6700S is `max-bsu`, and AX6600S is `max-psp`.
		The example on the left shows when the number of active BSUs/PSPs is set to 1 during a scheduled time range. If the number of installed BSUs/PSPs is 2, the device operates on the assumption that the number of active BSUs/PSPs is 1 and that the number of standby BSUs/PSPs is 1.
		- The AX6700S series is `standby-bsu`, and the AX6600S series is `standby-psp`.
		In the example on the left, the power supply of standby BSU/PSP is set to OFF.

	For automatic control based on traffic amount (T)	

	`(config)# adaptive-power-control {max-bsu | max-psp} 1`
	
	`(config)# adaptive-power-control {standby-bsu | standby-psp} cold2`
		- The AX6700S series is `max-bsu`, and the AX6600S series is `max-psp`.
		The example on the left shows when the number of active BSUs/PSPs is set to 1 due to a decrease in traffic. If the number of installed BSUs/PSPs is 2, the device operates on the assumption that the number of active BSUs/PSPs is 1 and that the number of standby BSUs/PSPs is 1.
		- The AX6700S series is `standby-bsu`, and the AX6600S series is `standby-psp`.
		In the example on the left, the power supply of the standby BSU/PSP is set to OFF due to the decrease in traffic amount.

Rough standard of power saving effects	AX6700S series 207 (W) per BSU-LA and 229 (W) per BSU-LB AX6600S series 87 (W) per CSU-1A and 93 (W) per CSU-1B	
Notes	- Standby BSU/PSP is automatically started for system switching when a failure occurs in the active BSU/PSP while the power supply of the standby BSU/PSP is set to OFF by this setting. Since system switching is accompanied with the start of the standby BSU/PSP, it does take some time.	
Supplementary items	- This setting provides an effective power saving effect in the device configuration where the standby BSU/PSP exists.	
Related documents	AX6700S/AX6600S/AX6300S Software Manual Configuration Guide Vol.1 and Vol.2	

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX6700S AX6600S

<table>
<tr><th>2.2.4</th><th>Cutting wasted power</th><th colspan="2">Standby NIF Power Feed OFF Functionality</th></tr>
<tr><td>Overview</td><td colspan="3">The power supply of the standby NIF is set to OFF.</td></tr>
<tr><td>Applicable models</td><td colspan="3">AX6700S, AX6600S series</td></tr>
<tr><td>Configuration setting examples</td><td colspan="3">For the full-time execution of power saving functionality (R)
For automatic control based on scheduled settings (S) Common setting item</td></tr>
<tr><td></td><td>(config)# interface port-channel 10
(config-if)# channel-group max-active-port 1
(config-if)# exit</td><td colspan="2">- Sets channel group 10. Sets a standby link functionality to channel group 10 and then sets the maximum number of ports to 1. Channel group 10 operates in the link-down mode.</td></tr>
<tr><td></td><td>(config)# interface tengigabitethernet 1/1
(config-if)# channel-group 10 mode on
(config-if)# lacp port-priority 200
(config-if)# exit</td><td colspan="2">- Registers port 1/1 in channel group 10 as static link aggregation and sets the port priority level to 200.</td></tr>
<tr><td></td><td>(config)# interface tengigabitethernet 2/1
(config-if)# channel-group 10 mode on
(config-if)# lacp port-priority 300
(config-if)# exit</td><td colspan="2">- Registers port 2/1 in channel group 10 as static link aggregation and sets the port priority level to 300.</td></tr>
<tr><td></td><td>(config)# redundancy nif-group 1 nif 1 priority 1
(config)# redundancy nif-group 1 nif 2 priority 2</td><td colspan="2">- Sets NIF belonging to a NIF redundant group and the priority level of NIF in the group.</td></tr>
<tr><td></td><td colspan="3">For the full-time execution of power saving functionality (R)</td></tr>
<tr><td></td><td>(config)# interface range tengigabitethernet 1/2-4, tengigabitethernet 2/2-4
(config-if-range)# shutdown
(config-if-range)# exit</td><td colspan="2">- Shuts down any unused port in a NIF redundant group.</td></tr>
<tr><td></td><td>(config)# redundancy nif-group 1 max-standby-nif 1</td><td colspan="2">- Sets the maximum number of standby NIFs in a NIF redundant group.</td></tr>
<tr><td></td><td colspan="3">For automatic control based on scheduled settings (S)</td></tr>
<tr><td></td><td>(config)# schedule-power-control shutdown interface range tengigabitethernet 1/2-4, tengigabitethernet 2/2-4</td><td colspan="2">- Shuts down any port that is not used during a scheduled time range, in a NIF redundant group.</td></tr>
<tr><td></td><td>(config)# schedule-power-control redundancy nif-group 1 max-standby-nif 1</td><td colspan="2">- Sets the maximum number of standby NIFs in a NIF redundant group during a scheduled time range.</td></tr>
<tr><td>Rough standard of power saving effects</td><td colspan="3">The rough standard of a power saving effect per main NIF is as follows:
<table>
<tr><th colspan="2">AX6700S</th></tr>
<tr><th>Type of NIF</th><th>Standard of power saving effect</th></tr>
<tr><td>NK1G-24T</td><td>97 (W)</td></tr>
<tr><td>NK1G-24S</td><td>80 (W)</td></tr>
<tr><td>NK10G-4RX</td><td>83 (W)</td></tr>
<tr><td>NK10G-8RX</td><td>100 (W)</td></tr>
</table>
<table>
<tr><th colspan="2">AX6600S</th></tr>
<tr><th>Type of NIF</th><th>Standard of power saving effect</th></tr>
<tr><td>NK1G-24T</td><td>84 (W)</td></tr>
<tr><td>NK1G-24S</td><td>68 (W)</td></tr>
<tr><td>NK10G-4RX</td><td>71 (W)</td></tr>
<tr><td>NK10G-8RX</td><td>88 (W)</td></tr>
</table></td></tr>
<tr><td>Notes</td><td colspan="3">- The standby NIF is automatically started for system switching when a failure occurs in the active NIF and in a port while the power supply of the standby NIF is set to OFF by this setting. Since system switching is accompanied with the start of standby NIF, it does take some time.</td></tr>
<tr><td>Supplementary items</td><td colspan="3"></td></tr>
<tr><td>Related documents</td><td colspan="3">AX6700S/AX6600S/AX6300S Software Manual Configuration Guide Vol.1 and Vol.2</td></tr>
</table>

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX6700S AX6600S AX6300S

2.2.5	Cutting wasted power	LED OFF functionality

Overview	The port LED is turned off.
Applicable models	**AX6700S, AX6600S, AX6300S series**
Configuration setting examples	For the full-time execution of power saving functionality (R) `(config)# system port-led disable` - Turns off the LED. For automatic control based on scheduled settings (S) `(config)# schedule-power-control port-led disable` - Sets it so that the LED goes off during a scheduled time range. For automatic control based on traffic amount (T) `(config)# adaptive-power-control port-led disable` - Sets it so that LED goes off due to the phenomenon of traffic
Rough standard of power saving effects	The rough standard of a power saving effect per main NIF is as follows:

AX6700S

Type of NIF	Standard of power saving effect
NK1G-24T	0.6 (W)
NK1G-24S	0.5 (W)
NK10G-4RX	0.3 (W)
NK10G-8RX	0.7 (W)

AX6600S

Type of NIF	Standard of power saving effect
NK1G-24T	0.6 (W)
NK1G-24S	0.5 (W)
NK10G-4RX	0.3 (W)
NK10G-8RX	0.7 (W)

AX6300S

Type of NIF	Standard of power saving effect
NH1G-24T	0.6 (W)
NH1G-24S	0.5 (W)
NH10G-1RX	0.3 (W)
NH10G-4RX	0.7 (W)

Notes	- In the AX6300S series, the automatic controls based on scheduled settings and traffic amount are not supported.
Supplementary items	- Even if the LED of a NIF port is set so that it goes off, it lights up when using the operation key on the system operation panel. The operating status of a port can be confirmed in this case. The LED that was turned on goes off 60 seconds after key operation.
Related documents	AX6700S/AX6600S/AX6300S Software Manual Configuration Guide Vol.1

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX6700S AX6600S

2.2.6	Power saving by eco-operation	Switching to power saving mode while online
Overview	The operating clock frequency of the BSU/PSP is lowered to reduce power consumption.	
Applicable models	**AX6700S, AX6600S series**	
Configuration setting examples	For the full-time execution of power saving functionality (R) `(config)# power-control mode mode2`	- Lowers the operating clock frequency of the BSU/PSP to reduce power consumption.
	For automatic control based on scheduled settings (S) `(config)# schedule-power-control power-control mode mode2`	- Lowers the operating clock frequency of the BSU/PSP during a scheduled time range to reduce power consumption.
	For automatic control based on traffic amount (T) `(config)# adaptive-power-control power-control mode mode2`	- Lowers the operating clock frequency of the BSU/PSP due to the decrease in traffic to reduce power consumption.
Rough standard of power saving effects	AX6700S series 52 (W) per BSU-LA and 55 (W) per BSU-LB AX6600S series 26 (W) per CSU-1A and 27 (W) per CSU-1B	
Notes	- Set the BSU/PSP as a redundant configuration when changing the power control of the BSU/PSP. A device operates as described below during changes in settings when the standby BSU/PSP does not exist. The number of active BSUs/PSPs decreases during changes in operation when multiple active BSUs/PSPs are installed. The device restarts when the number of BSUs/PSPs is 1.	
Supplementary items	- The packet throughput becomes approximately 50% (compared with the normal power mode). However, it varies depending on the type of installed BSU, CSU, and NIF, the number of installed models, the load conditions, and other factors.	
Related documents	AX6700S/AX6600S/AX6300S Software Manual Configuration Guide Vol.1	

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX6700S AX6600S

2.2.7	Automatic control based on scheduled settings	
Overview	A time range is specified to execute a power saving functionality.	
Applicable models	**AX6700S, AX6600S series**	
Configuration setting examples		Sets all power saving functions that support the automatic control based on the scheduled settings. In the example on the left, all functions are executed. For details, see subsection *2.2.1* to *2.2.6*.
	(config)# schedule-power-control shutdown interface *gigabitethernet 3/24*	- Turns off the power of the port by setting a port to the shutdown state.
	(config)# schedule-power-control shutdown nif *4*	- Turns off the power of the NIF by setting it to the disabled state during a scheduled time range.
	(config)# schedule-power-control {max-bsu | max-psp} *1*	- The example on the left shows when the number of active BSUs/PSPs is set to 1. If the number of installed BSUs/PSPs is 2, the device operates on the assumption that the number of active BSUs/PSPs is 1 and that the number of standby BSUs/PSPs is 1.
	(config)# schedule-power-control {standby-bsu | standby-psp} cold2	- Sets the standby BSU/PSP to cold standby 2 and reduces power consumption.
	(config)# schedule-power-control shutdown interface *range tengigabitethernet 1/2-4, tengigabitethernet 2/2-4* **(config)# schedule-power-control redundancy nif-group** *1* **max-standby-nif 1**	- Shuts down any port that is not used during a scheduled time range, in a NIF redundant group. - Sets the maximum number of standby NIFs in a NIF redundant group during a scheduled time range.
	(config)# schedule-power-control port-led disable	- Turns off the LED.
	(config)# schedule-power-control mode mode2	- Reduces the power consumption of the BSU/PSP for operation
	(config)# schedule-power-control time-range *1 weekly* **start-time** *fri 2000* **end-time** *mon 0800* **action enable**	- Sets a scheduled time range. An example on the left is given to specify the schedule between 20:00 on Friday and 08:00 on Monday every week by entry No. 1.
Rough standard of power saving effects	The rough standard is based on the combined power saving functionality to be executed. See subsection *2.2.1* to *2.2.6*.	
Notes	- The power saving functionality operates based on the default setting of each command when a configuration setting command is omitted. To prevent the device from not operating as expected, set all corresponding power saving functions explicitly when using automatic control.	
Supplementary items	- The date and each day as well as the day of the week can be specified for the scheduled time range. When specifying a date **date start-time <yymmdd> <hhmm> end-time <yymmdd> <hhmm>** When specifying a day of the week **weekly start-time {sun | mon | tue | wed | thu | fri | sat} <hhmm> end-time {sun | mon | tue | wed | thu | fri | sat} <hhmm>** When specifying each day **everyday start-time <hhmm> end-time <hhmm>**	
Related documents	AX6700S/AX6600S/AX6300S Software Manual Configuration Guide Vol.1	

Note: The rough standard of the power saving effect described above is the difference of the power consumption obtained when a power saving functionality is not executed and when it is executed. It is based on the actual measurement result that was obtained in the verification environment of our company under specific conditions. The result is not guaranteed under all conditions.

AX6700S AX6600S

2.2.8	Automatic control based on traffic amount	
Overview	The power saving functionality is automatically executed when traffic amount decreases continuously. It is automatically canceled when traffic amount increases continuously.	
Applicable models	**AX6700S, AX6600S**	
Configuration setting examples		Sets all power saving functions that support the automatic control based on the amount of traffic. In an example on the left, all functions are executed. For details, see subsection *2.2.3*, *2.2.5*, and *2.2.6*.
	(config)# **adaptive-power-control** **{max-bsu | max-psp}** *1*	- The example on the left shows when the number of active BSUs/PSPs is set to 1. If the number of installed BSUs/PSPs is 2, the device operates on the assumption that the number of active BSUs/PSPs is 1 and that the number of standby BSUs/PSPs is 1.
	(config)# **adaptive-power-control** **{standby-bsu | standby-psp}** **cold2**	- Sets the standby BSU/PSP to cold standby 2 and reduces power consumption.
	(config)# **adaptive-power-control** **port-led disable**	- Turns off the LED.
	(config)# **adaptive-power-control mode** **mode2**	- Reduces the power consumption of the BSU/PSP for operation
	(config)# **adaptive-power-control** **decrease-traffic-debounce** *60*	Sets the control parameter based on the traffic amount. - Sets the monitoring time, required until a power saving functionality is started due to traffic amount, in minutes. In the example on the left, the power saving functionality is started when a small amount of traffic is continued for more than 60 minutes.
	(config)# **adaptive-power-control** **increase-traffic-debounce** *1*	- Sets the monitoring time, required until a power saving functionality is canceled due to traffic amount, in minutes. In the example on the left, the power saving functionality is canceled when a large amount of traffic is continued for more than one minute.
	(config)# **adaptive-power-control enable**	- Enables the power saving functionality based on traffic amount
Rough standard of power saving effects	The rough standard is based on the combined power saving functionality to be executed. See subsection 2.2.3, 2.2.5, and 2.2.6.	
Notes	- The power saving functionality operates based on the default setting of each command when a configuration setting command is omitted. To prevent the device from not operating as expected, set all corresponding power saving functions explicitly when using automatic control. - The power saving functionality based on traffic can be set when any of the configurations below are not set. **power-control mode1, redundancy bsu-load-balancing smac, redundancy bsu-mode fixed, redundancy standby-bsu cold, schedule-power-control time-range** - Set the BSU/PSP as the redundant configuration when changing the power control of the BSU/PSP using a power saving functionality based on traffic amount. When the number of BSUs/PSPs in operation is 1, the power control of the BSU cannot be changed even if the power saving functionality based on traffic amount is executed or canceled.	
Supplementary items	- The time required until a power saving functionality is executed and canceled can be respectively specified as the monitoring time of traffic amount. The setting range is as follows: Time required until execution: 60 (default) to 360 minutes Time required until cancelation: 1 (default) to 360 minutes	
Related documents	AX6700S/AX6600S/AX6300S Software Manual Configuration Guide Vol.1	

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

2.3 Power saving settings for the AX3830S and AX3650S series

Configuration setting examples of the power saving functions for the AX3830S and AX3650S series are given below.

AX3830S AX3650S

2.3.1	Cutting wasted power	**Unused port power feed OFF functionality**
Overviews	The power supply of the unused port is set to OFF.	
Applicable models	**AX3830S, AX3650S**	
Configuration setting examples	For the full-time execution of power saving functionality (R) **(config)# interface** *gigabitethernet 1/0/24* **(config-if)# shutdown** - Shifted to the **config-if** mode. - Turns off the power of the port by setting a port to the shutdown state. For automatic control based on scheduled settings (S) **(config)# schedule-power-control shutdown interface** *gigabitethernet 1/0/24* - Turns off the power of the port by setting a port to the shutdown state during a scheduled time range.	
Rough standard of power saving effects	The rough standard of a power saving effect per port is as follows.	
Notes		
Supplementary items		
Related documents	AX3800S Software Manual Configuration Guide Vol.1 AX3600S Software Manual Configuration Guide Vol.1	

AX3830S	
UTP port (GbE)	1.1 (W)
UTP port (FE)	0.4 (W)
SFP/SFP+ shared port (SFPP-SR)	1.4 (W)
QSFP+ port (QSFP-SR4)	7.5 (W)

AX3650S	
UTP port (GbE)	0.5 (W)
SFP port (SFP-SX)	0.3 (W)
SFP/SFP+ shared port (SFPP-SR)	1.6 (W)

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX3830S AX3650S

2.3.2	Cutting wasted power	Link-down port power saving functionality
Overview	The power consumption in a link-down state is reduced on an Ethernet port on which 10BASE-T, 100BASE-TX, and 1000BASE-T are used.	
Applicable models	**AX3830S, AX3650S**	
Configuration setting examples	For the full-time execution of power saving functionality (R) `(config-if)# power-control port cool-standby` — Enables the power saving operation of a link-down port. For automatic control based on scheduled settings (S) `(config-if)# schedule-power-control power-control port cool-standby` — Enables the power saving operation of a link-down port during a scheduled time range.	
Rough standard of power saving effects	AX3830S: 0.05 (W) per port AX3650S: 0.04 (W) per port	
Notes	- This setting is collectively performed in a device. It cannot be done in units of ports. - A port for which an optical signal is used cannot use this functionality. - When this command is set, the link-up state of an Ethernet port becomes longer by about three seconds than when it is not set.	
Supplementary items	- A port in which the configuration command (`shutdown`) was set is also reduced by the power configuration.	
Related documents	AX3800S Software Manual Configuration Guide Vol.1 AX3600S Software Manual Configuration Guide Vol.1	

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX3830S AX3650S

2.3.3	Cutting wasted power	Sleep functionality - Setting OFF and ON by specifying the time range

Overview	An unused scheduled time range is set into the device sleep state.
Applicable models	**AX3830S, AX3650S**

Configuration setting examples	For automatic control based on scheduled settings (S)
	`(config)# schedule-power-control system-sleep`
	`(config)# schedule-power-control time-range 1 weekly start-time fri 2000 end-time mon 0800 action enable`
	- Sets the device sleep state.
	- Sets a scheduled time range. An example on the left is given to specify the schedule between 20:00 on Friday and 08:00 on Monday every week by entry No. 1.

Rough standard of power saving effects	AX3830S: AX3830S-44XW 160 (W); AX3830S-44X4QW 198 (W) AX3650S: AX3650S-24T6XW 57 (W); AX3650S-48T4XW 67 (W); AX3650S-20S6XW 60 (W)
Notes	- When starting a device from the sleep state by forced cancel operation, hold down the **RESET** button in front of the device (for five seconds or more) until all LEDs on the front panel light up. At that time, the device is started in the schedule-disabled mode. Therefore, put the device into the schedule apply mode using a `set power-control schedule enable` command when returning it to the sleep mode. - Information that is not saved is not retained because the device sleep state is the same as when the power of the device is turned off. - When the sleep state exceeds 20 days, it is automatically canceled once every 20 days to start a device. After the device starts, it is put into the sleep state again.
Supplementary items	- The date and each day as well as the day of the week can be specified for the scheduled time range. When specifying the date **`date start-time <yymmdd> <hhmm> end-time <yymmdd> <hhmm>`** When specifying each day **`weekly start-time {sun | mon | tue | wed | thu | fri | sat} <hhmm> end-time {sun | mon | tue | wed | thu | fri | sat} <hhmm>`** When specifying every day **`everyday start-time <hhmm> end-time <hhmm>`**
Related documents	AX3800S Software Manual Configuration Guide Vol.1 AX3600S Software Manual Configuration Guide Vol.1

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX3830S AX3650S

2.3.4	Cutting wasted power	LED luminance setting functionality - Fixed
Overview	The luminance of the port LED is fixed to darkening or OFF.	
Applicable models	**AX3830S, AX3650S**	
Configuration setting examples	For the full-time execution of power saving functionality (R) `(config)# system port-led {economy | disable }` — Sets the luminance of the LED. Darkening is set as `economy`, with OFF as `disable`. For automatic control based on scheduled settings (S) `(config)# schedule-power-control port-led {economy | disable}` — Sets the luminance of the LED during a scheduled time range. Darkening is set as `economy`, with OFF as `disable`.	
Rough standard of power saving effects	AX3830S: AX3830S-44XW — Darkening 0.7 (W) OFF 1.0 (W); AX3830S-44X4QW — Darkening 0.7 (W) OFF 1.1 (W) AX3650S: AX3650S-24T6XW — Darkening 0.5 (W) OFF 0.9 (W); AX3650S-48T4XW — Darkening 0.7 (W) OFF 1.4 (W); AX3650S-20S6XW — Darkening 0.5 (W) OFF 0.9 (W)	
Notes		
Related documents	AX3800S Software Manual Configuration Guide Vol.1 AX3600S Software Manual Configuration Guide Vol.1	

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX3830S AX3650S

2.3.5	Cutting wasted power	LED luminance setting functionality - Changed automatically

Overview

The luminance of the Port LED is controlled automatically. A specified event causes the LED to light up (automatic LED operation). The LED then darkens and finally goes out (OFF).

Applicable models

AX3830S, AX3650S

Configuration setting examples

For the full-time execution of power saving functionality (R)
For automatic control based on scheduled settings (S) Common setting item

```
(config)# system port-led trigger console
(config)# system port-led trigger interface gigabitethernet 1/0/1,gigabitethernet 1/0/20
(config)# system port-led trigger mc
```

- Sets a console, port 0/1, port 0/20 (link-up/down), and MC (insertion/extraction) during automatic LED operation.

For the full-time execution of power saving functionality (R)

```
(config)# system port-led enable
```

- Sets LED operation to normal luminance (ON).

For automatic control based on scheduled settings (S)

```
(config)# schedule-power-control port-led enable
```

- Sets the LED operation during a scheduled time range to normal luminance (ON).

Rough standard of power saving effects

AX3830S	
AX3830S-44XW	Darkening 0.7 (W) OFF 1.0 (W)
AX3830S-44X4QW	Darkening 0.7 (W) OFF 1.1 (W)

AX3650S	
AX3650S-24T6XW	Darkening 0.5 (W) OFF 0.9 (W)
AX3650S-48T4XW	Darkening 0.7 (W) OFF 1.4 (W)
AX3650S-20S6XW	Darkening 0.5 (W) OFF 0.9 (W)

Notes

Supplementary items

- During automatic operation, multiple items can be selected from 1) login/logout by console connection, 2) the link-up/down of the specified port, and 3) the insertion and extraction of a memory card (SD card).
- The LED lights up during automatic operation.
- The current luminance is shifted to power saving luminance (darkening) after 60 seconds passes from the last automatic operation.
- The current state is then shifted to OFF 10 minutes after it is lastly shifted to the power saving luminance.

Related documents

AX3800S Software Manual Configuration Guide Vol.1
AX3600S Software Manual Configuration Guide Vol.1

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX3830S AX3650S

2.3.6	Automatic control based on scheduled settings	
Overview	A time range is specified to execute a power saving functionality.	
Applicable models	**AX3830S, AX3650S**	
Configuration setting examples		Sets all power saving functions, not including the sleep function, that support the automatic control based on scheduled settings. However, only "Fixed" or "Auto change" can be set for an LED luminance-setting function. In the example on the left, all functions are executed. For details, see subsection 2.3.1, 2.3.2, 2.3.4, and 2.3.5.
	(config)# schedule-power-control shutdown interface *gigabitethernet 1/0/24*	- Turns off the power of the port by setting a port to the shutdown state during a scheduled time range.
	(config-if)# schedule-power-control power-control port cool-standby	- Enables the power saving operation of a link-down port during a scheduled time range.
	(config)# schedule-power-control port-led {economy | disable}	- Sets the luminance of the LED during a scheduled time range. Darkening is set as `economy`, with OFF as `disable`.
	(config)# schedule-power-control time-range *1 weekly* **start-time** *fri 2000* **end-time** *mon 0800* **action enable**	- Sets a scheduled time range. An example on the left is given to specify the schedule between 20:00 on Friday and 08:00 on Monday every week by entry No. 1.
Rough standard of power saving effects	The rough standard is based on the combined power saving functionality to be executed. See subsection 2.3.1, 2.3.2, 2.3.4, and 2.3.5.	
Notes	- Power saving functionality other than a device sleep functionality can be used with the specified schedule combined. However, the device sleep functionality preferentially operates when it is set.	
Supplementary items	- The date and each day as well as the day of the week can be specified for the scheduled time range. When specifying the date **date start-time <yymmdd> <hhmm> end-time <yymmdd> <hhmm>** When specifying each day **weekly start-time {sun | mon | tue | wed | thu | fri | sat} <hhmm> end-time {sun | mon | tue | wed | thu | fri | sat} <hhmm>** When specifying every day **everyday start-time <hhmm> end-time <hhmm>**	
Related documents	AX3800S Software Manual Configuration Guide Vol.1 AX3600S Software Manual Configuration Guide Vol.1	

Note: The rough standard of the power saving effect described above is the difference of the power consumption obtained when a power saving functionality is not executed and when it is executed. It is based on the actual measurement result that was obtained in the verification environment of our company under specific conditions. The result is not guaranteed under all conditions.

2.4 Power saving settings for the AX3640S series

Configuration setting examples of power saving functions for theAX3640S series are given below.

AX3640S

2.4.1	Cutting wasted power	Unused port power feed OFF functionality
Overview	The power supply of the unused port is set to OFF.	
Applicable models	**AX3640S**	
Configuration setting examples	For the full-time execution of power saving functionality (R)	
	(config)# interface *gigabitethernet 0/24* **(config-if)# shutdown**	- Shifted to the **config-if** mode. - Turns off the power of the port by setting a port to the shutdown state.
	For automatic control based on scheduled settings (S)	
	(config)# schedule-power-control shutdown interface *gigabitethernet 0/24*	- Turns off the power of the port by setting a port to the shutdown state during a scheduled time range.
Rough standard of power saving effects	Rough standard of power saving effect per port UTP port (1000BASE-T) 1.0 (W) SFP port (SFP-SX) 0.3 (W) XFP port (XFP-SR) 2.2 (W)	
Notes		
Supplementary items		
Related documents	AX3600S Software Manual Configuration Guide Vol.1	

AX3640S

2.4.2	Automatic control based on scheduled settings	
Overview	A time range is specified to execute a power saving functionality.	
Applicable models	**AX3640S**	
Configuration setting examples	**(config)# schedule-power-control shutdown interface** *gigabitethernet 0/24*	- Sets the power saving functionality used during a scheduled time range
	(config)# schedule-power-control time-range *1 weekly* **start-time** *fri 2000* **end-time** *mon 0800* **action enable**	- Sets a scheduled time range. An example on the left is given to specify the schedule between 20:00 on Friday and 08:00 on Monday every week by entry No. 1.
Rough standard of power saving effects	See subsection *2.4.1*.	
Notes		
Supplementary items	- The date and each day as well as the day of the week can be specified for the scheduled time range. When specifying the date **date start-time <yymmdd> <hhmm> end-time <yymmdd> <hhmm>** When specifying each day **weekly start-time {sun | mon | tue | wed | thu | fri | sat} <hhmm>** **end-time {sun | mon | tue | wed | thu | fri | sat} <hhmm>** When specifying every day **everyday start-time <hhmm> end-time <hhmm>**	
Related documents	AX3600S Software Manual Configuration Guide Vol.1	

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

2.5 Power saving settings for the AX2500S, AX2200S, AX1250S, and AX1240S series

Configuration setting examples of power saving functions for the AX2500S, AX2200S, AX1250S, and AX1240S series are given below.

AX2500S AX2200S AX1250S AX1240S

2.5.1	Cutting wasted power	Unused port power feed OFF functionality

Overview

The power supply of the unused port is set to OFF.

Applicable models

AX2500S, AX2200X, AX1250S, AX1240S series

Configuration setting examples

For the full-time execution of power saving functionality (R)

(config)# interface *gigabitethernet 0/24*	- Shifts to the **config-if** mode.
(config-if)# shutdown	- Turns off the power of the port by setting a port to the shutdown state.

For automatic control based on scheduled settings (S)

AX2500S **(config)# schedule-power-control shutdown interface** *gigabitethernet 0/24* AX2200S/AX1250S/AX1240S **(config)# schedule-power-control shutdown interface** *0/24*	- Turns off the power of the port by setting a port to the shutdown state during a scheduled time range.

Rough standard of power saving effects

Per AX2500S port			
	UTP port (GbE)	SFP port (SFP-SX)	SFP/SFP+ shared port (SFPP-SR)
AX2530S-24T	0.5 (W)	0.2 (W)	-
AX2530S-48T	0.5 (W)	0.2 (W)	-
AX2530S-24T4X	0.5 (W)	-	0.4 (W)
AX2530S-48T2X	0.5 (W)	0.1 (W)	0.2 (W)
AX2530S-24S4X	-	0.1 (W)	0.4 (W)

Per AX2200S port		
	UTP port (GbE)	SFP port (SFP-SX)
Common to all models	0.5 (W)	0.2 (W)

Per AX1250S/AX1240S port		
	UTP port (GbE)	UTP port (FE)
Common to all models	0.5 (W)	0.2 (W)

Notes

Supplementary items

Related documents

AX2500S Software Manual Configuration Guide Vol.1
AX2200S Software Manual Configuration Guide Vol.1
AX1250S/AX1240S Software Manual Configuration Guide Vol.1

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX2500S AX2200S AX1250S AX1240S

2.5.2	Cutting wasted power	Link-down port power saving functionality

Overview

The power consumption in a link-down state is reduced on an Ethernet port on which 10BASE-T, 100BASE-TX, and 1000BASE-T are used.

Applicable model

AX2500S, AX2200S, AX1250S, AX1240S

Configuration setting examples

For the full-time execution of power saving functionality (R)

```
(config)# power-control port cool-standby
```

- Enables the power saving operation of a link-down port.

For automatic control based on scheduled settings (S)

```
(config)# schedule-power-control port
cool-standby
```

- Enables the power saving operation of a link-down port during a scheduled time range.

Rough standard of power saving effects

Per AX2500S port	
UTP port (GbE)	0.05 (W)

Per AX2200S port	
UTP port (GbE)	0.05 (W)

Per AX1250S/AX1240S port	
UTP port (GbE)	0.05 (W)
UTP port (FE)	0.06 (W)

Notes

- This setting is collectively performed in a device. It cannot be done in units of ports.
- An SFP port and SFP/SFP + shared port cannot use this functionality.
- The link-up time becomes longer when this command is set.
- For the AX1250S and AX1240S series
  The link state of all Fastethernet ports changes when this command is set. This influences communication.
  On a speed-fixed setting or an automatic MDIX function-disabled Fastethernet port, a port power saving functionality is not enabled. Therefore, set auto negotiation to **Enable** and set the automatic MDIX functionality to **Enable** (mdix auto) during operation when enabling the port power saving functionality.

Supplementary items

- The port to which a configuration command (`shutdown`) was set is also reduced in the power configuration.

Related documents

AX2500S Software Manual Configuration Guide Vol.1
AX2200S Software Manual Configuration Guide Vol.1
AX1250S/AX1240S Software Manual Configuration Guide Vol.1

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX2500S | AX1250S | AX1240S

2.5.3	Cutting wasted power	Sleep functionality - Setting OFF and ON by specifying the time range

Overview

An unused scheduled time range is set into the device sleep state.

Applicable models

AX2500S, AX1250S, AX1240S

Configuration setting examples

For automatic control based on scheduled settings (S)

```
(config)# schedule-power-control system-sleep
(config)# schedule-power-control time-range 1 weekly start-time fri 2000 end-time mon 0800 action enable
```

- Sets the device sleep state.
- Sets a scheduled time range. An example on the left is given to specify the schedule between 20:00 on Friday and 08:00 on Monday every week by entry No. 1.

Rough standard of power saving effects

AX2500S	
AX2530S-24T	32 (W)
AX2530S-48T	62 (W)
AX2530S-24T4X	46 (W)
AX2530S-48T2X	72 (W)
AX2530S-24S4X	50 (W)

AX1250S/AX1240S	
AX1250S-24T2C	16 (W)
AX1240S-24T2C	12 (W)
AX1240S-48T2C	24 (W)
AX1240S-24P2C	15 (W)

Notes

- When starting a device from a sleep state by forced cancel operation, hold down the **RESET** button in front of the device (for three seconds or more) until all LEDs on the front panel light up. (Forced sleep cancelation) At that time, the device is started in the schedule-disabled mode. Therefore, put the device into the schedule apply mode using a `set power-control schedule enable` command when returning it to the sleep mode.
- Information that is not saved is not retained because the device sleep state is the same as when the power of the device is turned off.
- When the sleep state exceeds 20 days, it is automatically canceled once every 20 days to start a device. After the device starts, it is put into the sleep state again.

Supplementary items

- The date, each day, and infinity, as well as a day of the week, can be specified for the scheduled time range.

  When specifying the date

  ```
  date start-time <yymmdd> <hhmm> end-time <yymmdd> <hhmm>
  ```

  When specifying each day

  ```
  weekly start-time {sun | mon | tue | wed | thu | fri | sat} <hhmm>
  end-time {sun | mon | tue | wed | thu | fri | sat} <hhmm>
  ```

  When specifying every day

  ```
  everyday start-time <hhmm> end-time <hhmm>
  ```

  When specifying infinity (supported only in the AX2500S series)

  Do not set infinity as OFF or ON when specifying a time range. Only forced sleep cancelation is available to restore to the former state.

Related documents

AX2500S Software Manual Configuration Guide Vol.1
AX1250S/AX1240S Software Manual Configuration Guide Vol.1

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX2500S

2.5.4	Cutting wasted power	Sleep functionality - Restoration option based on the detection of WOL packet reception

Overview

During the specified time range, the system is put into the device sleep state. It is also restored when WOL packets are received in the sleep state.

Applicable models

AX2500S

Configuration setting examples

For automatic control based on scheduled settings (S)

```
(config)# schedule-power-control system-sleep
(config)# schedule-power-control time-range 1 everyday start-time 0000 end-time 0700 action enable

(config)# schedule-power-control wakeup-option wol interface gigabitethernet 0/23-24
```

- Sets the device sleep state.
- Sets a scheduled time range. The example on the left is given to specify the schedule between 00:00 and 07:00 every day by entry No. 1.
- Specifies the WOL packet reception detection port of the restoration option. In the example on the left, the device is restored even before the termination of the scheduled time range when WOL packets are detected on port 23 or 24 during a scheduled time range.

Rough standard of power saving effects

AX2500S			
AX2530S-24T	21 (W)	AX2530S-24T4X	29 (W)
AX2530S-48T	42 (W)	AX2530S-48T2X	49 (W)
AX2530S-24S4X	20 (W)		

Notes

- When starting a device from a sleep state by forced cancel operation, hold down the **RESET** button in front of the device (for five seconds or more) until all LEDs on the front panel light up. (Forced sleep cancelation) At that time, the device is started in the schedule-disabled mode. Therefore, put the device into the schedule apply mode using a `set power-control schedule enable` command when returning it to the sleep mode.
- Information that is not saved is not retained because the device sleep state is the same as when the power of the device is turned off.

Supplementary items

- The date, each day, and infinity, as well as a day of the week, can be specified for the scheduled time range.

  When specifying the date

  `date start-time <yymmdd> <hhmm> end-time <yymmdd> <hhmm>`

  When specifying each day

  `weekly start-time {sun | mon | tue | wed | thu | fri | sat} <hhmm> end-time {sun | mon | tue | wed | thu | fri | sat} <hhmm>`

  When specifying every day

  `everyday start-time <hhmm> end-time <hhmm>`

  When specifying infinity

  Do not set infinity designation when using a WOL detection option. Since the device is restored in the schedule suppress mode, the current state is not shifted to the sleep state of the next occurence when it is not returned to the schedule apply mode using an operation command (`set power-control schedule`).
- It takes one minute or more from when the reception of WOL packets is detected until this Switch is restored to the usable state.
- The models that can be specified for a WOL packet reception detection port are as follows:

Model name	1-port selection				2-port selection			
AX2530S-24T	0/23	0/24	0/25	0/26	0/23, 0/24	0/25, 0/26	0/23, 0/26	0/24, 0/25
AX2530S-48T	0/47	0/48	0/49	0/50	0/47, 0/48	0/49, 0/50	0/47, 0/50	0/48, 0/49
AX2530S-24T4X	0/23		0/24		0/23, 0/24			
AX2530S-48T2X	0/47	0/48	0/49	0/50	0/47, 0/48	0/49, 0/50	0/47, 0/50	0/48, 0/49
AX2530S-24S4X	0/23		0/24		0/23, 0/24			

Related documents

AX2500S Software Manual Configuration Guide Vol.1

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX2500S

2.5.5	Cutting wasted power	Sleep functionality - Restoration option based on port link-up detection

Overview

In the specified time range, a link-down state is detected on all specified ports so as to enter the device sleep state. The device is restored from the device sleep state when a link-up state is detected on any port or when the specified time range is terminated.

Applicable models

AX2500S

Configuration setting examples

For automatic control based on scheduled settings (S)

```
(config)# schedule-power-control system-sleep
(config)# schedule-power-control time-range 1 everyday start-time 0000 end-time 0700 action enable

(config)# schedule-power-control wakeup-option linkup interface gigabitethernet 0/25-26 down-detect 10
```

- Sets the device sleep state.
- Sets a scheduled time range. The example on the left specifies the schedule between 00:00 and 07:00 every day by entry No. 1.
- Specifies the link detection port of the restoration option. In the example on the left, the device detects that a link-down state is continued for 10 minutes on ports 25 and 26 during a scheduled time range and enters the device sleep state. It is restored when a link-up state is detected on port 25 or 26.

Rough standard of power saving effects

AX2500S	
AX2530S-24T	19 (W)
AX2530S-48T	40 (W)
AX2530S-24T4X	28 (W)
AX2530S-48T2X	46 (W)
AX2530S-24S4X	17 (W)

Notes

- When starting a device from a sleep state by forced cancel operation, hold down the **RESET** button in front of the device (for five seconds or more) until all LEDs on the front panel light up. (Forced sleep cancelation) At that time, the device is started in the schedule-disabled mode. Therefore, put the device into the schedule apply mode using a `set power-control schedule enable` command when returning it to the sleep mode.
- Information that is not saved is not retained because the device sleep state is the same as when the power of the device is turned off.

Supplementary items

- The date, each day, and infinity, as well as a day of the week, can be specified for the scheduled time range.
  When specifying the date
  `date start-time <yymmdd> <hhmm> end-time <yymmdd> <hhmm>`
  When specifying each day
  `weekly start-time {sun | mon | tue | wed | thu | fri | sat} <hhmm> end-time {sun | mon | tue | wed | thu | fri | sat} <hhmm>`
  When specifying every day
  `everyday start-time <hhmm> end-time <hhmm>`
  When specifying infinity
  `infinity`
- The monitoring time required from when all ports set to a link-up detection port using the down`-detect` parameter of a `schedule-power-control wakeup-option` command are linked down, until the device is shifted to the sleep state, can be set in minutes (in the range of 1 to 60 minutes). The default value is five minutes.
- A linked-up state can be detected on all ports.
- It takes one minute or more from when a linked-up state is detected until this Switch is restored to the usable state.

Related documents

AX2500S Software Manual Configuration Guide Vol.1

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX2500S AX2200S AX1250S AX1240S

2.5.6	Cutting wasted power	LED luminance setting functionality - Fixed
Overview	The luminance of the port LED is fixed to darkening or OFF. The AX2500S, AX1250S and AX1240S support darkening and OFF, while the AX2200S supports only OFF.	
Applicable models	**AX2500S, AX2200S, AX1250S, AX1240S**	
Configuration setting examples	For the full-time execution of power saving functionality (R) `(config)# system port-led {economy | disable }` — Sets the luminance of the LED. Darkening is set as `economy`, with OFF as `disable`. For automatic control based on scheduled settings (S) `(config)# schedule-power-control port-led {economy | disable}` — Sets the luminance of the LED during a scheduled time range. Darkening is set as `economy`, with OFF as `disable`.	
Rough standard of power saving effects	AX2500S AX2530S-24T: Darkening 0.5 (W) OFF 0.5 (W) AX2530S-48T: Darkening 1.0 (W) OFF 1.2 (W) AX2530S-24T4X: Darkening 0.3 (W) OFF 0.4 (W) AX2530S-48T2X: Darkening 0.5 (W) OFF 1.2 (W) AX2530S-24S4X: Darkening 0.5 (W) OFF 0.6 (W) AX1250S/AX1240S AX1250S-24T2C: Darkening 0.4 (W) OFF 0.6 (W) AX1240S-24T2C: Darkening 0.4 (W) OFF 0.5 (W) AX1240S-48T2C: Darkening 2.0 (W) OFF 2.7 (W) AX1240S-24P2C: Darkening 0.4 (W) OFF 0.6 (W) AX2200S AX2230S-24T: OFF 0.6 (W) AX2230S-24P: OFF 0.7 (W)	
Notes		
Supplementary items		
Related documents	AX2500S Software Manual Configuration Guide Vol.1 AX2200S Software Manual Configuration Guide Vol.1 AX1250S/AX1240S Software Manual Configuration Guide Vol.1	

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX2500S AX2200S AX1250S AX1240S

2.5.7	Cutting wasted power	LED luminance setting functionality - Changed automatically

Overview

The luminance of the Port LED is controlled automatically. A specified event causes the LED to light up (automatic LED operation). The LED then darkens and finally goes out (OFF).
The AX2500S, AX1250S and AX1240S support darkening and OFF, while the AX2200S supports only OFF.

Applicable models

AX2500S, AX2200S, AX1250S, AX1240S

Configuration setting examples

For the full-time execution of power saving functionality (R)
For automatic control based on scheduled settings (S) Common setting item

```
(config)# system port-led trigger console
```

- Sets a console, port 0/1, port 0/20 (link-up/down), and MC (insertion/extraction) during automatic LED operation.

For the AX2500S series

```
(config)# system port-led trigger interface gigabitethernet 0/1,gigabitethernet 0/20
```

For the AX2200S/AX1250S/AX1240S series

```
(config)# system port-led trigger interface 0/1,0/20
```

```
(config)# system port-led trigger mc
```

For the full-time execution of power saving functionality (R)

```
(config)# system port-led enable
```

- Sets LED operation to normal luminance (ON).

For automatic control based on scheduled settings (S)

```
(config)# schedule-power-control port-led enable
```

- Sets the LED operation during a scheduled time range to normal luminance (ON).

Rough standard of power saving effects

AX2500S	
AX2530S-24T	Darkening 0.5 (W) OFF 0.5 (W)
AX2530S-48T	Darkening 1.0 (W) OFF 1.2 (W)
AX2530S-24T4X	Darkening 0.3 (W) OFF 0.4 (W)
AX2530S-48T2X	Darkening 0.5 (W) OFF 1.2 (W)
AX2530S-24S4X	Darkening 0.5 (W) OFF 0.6 (W)

AX1250S/AX1240S	
AX1250S-24T2C	Darkening 0.4 (W) OFF 0.6 (W)
AX1240S-24T2C	Darkening 0.4 (W) OFF 0.5 (W)
AX1240S-48T2C	Darkening 2.0 (W) OFF 2.7 (W)
AX1240S-24P2C	Darkening 0.4 (W) OFF 0.6 (W)

AX2200S	
AX2230S-24T	OFF 0.6 (W)
AX2230S-24P	OFF 0.7 (W)

Notes

Supplementary items

- During automatic operation, multiple items can be selected from 1) login/logout by console connection, 2) the insertion and extraction of the memory card (SD card), and 3) the link-up/down of the specified port.
- The LED lights up during automatic operation.
- The current luminance is shifted to power saving luminance (darkening) after 60 seconds passes from the last automatic operation.
- The current state is then shifted to OFF 10 minutes after it is lastly shifted to the power saving luminance.

Related documents

AX2500S Software Manual Configuration Guide Vol.1
AX2200S Software Manual Configuration Guide Vol.1
AX1250S/AX1240S Software Manual Configuration Guide Vol.1

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX2530S-48T | AX1240S-48T2C

2.5.8	Cutting wasted power	Semi-fanless functionality
Overview	The fan automatically stops to reduce power consumption when the temperature in the device is low.	
Applicable models	**AX2530S-48T, AX1240S-48T2C**	
Configuration setting examples	For the full-time execution of power saving functionality (R) `(config)# system fan-control`	- For a temperature for which forced cooling is not required, this sets it so that the cooling fan stops.
Rough standard of power saving effects	AX2530S-48T 3 (W) AX1240S-48T2C 1 (W)	
Notes	- The frequency at which the fan stops varies depending on the installation state of the device and the peripheral operating environment.	
Supplementary items	- Even when this setting is used, the fan operates for about 10 minutes after the system starts. - The cooling importance mode setting has priority when the fan operating mode is simultaneously set to the cooling importance mode compatible with a long-life solution. The fan operates at all times. - For the AX2530S-48T The fan stops after the state, in which the temperature in the device is 73°C or less, is continued for 10 minutes. It operates when a temperature of 74°C or more is detected in the device. - For the AX1240S-48T2C The fan stops after the state, in which the temperature in the device is 46°C or less, is continued for 10 minutes. It operates when a temperature of 47°C or more is detected in the device.	
Related documents	AX2500S Software Manual Configuration Guide Vol.1 AX1250S/AX1240S Software Manual Configuration Guide Vol.1	

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

AX2500S AX2200S AX1250S AX1240S

<table>
<tr><th>2.5.9</th><th colspan="2">Automatic control based on scheduled settings</th></tr>
<tr><td>Overview</td><td colspan="2">A time range is specified to execute a power saving functionality.</td></tr>
<tr><td>Applicable models</td><td colspan="2">AX2500S, AX2200S, AX1250S, AX1240S series</td></tr>
<tr><td rowspan="6">Configuration setting examples</td><td></td><td>Sets all power saving functions, not including a sleep function, that support the automatic control based on scheduled settings. However, only "Fixed" or "Auto change" can be set for an LED luminance-setting function.
In the example on the left, all functions are executed. For details, see subsection 2.5.1, 2.5.2, 2.5.6, and 2.5.7.</td></tr>
<tr><td>For AX2500S
(config)# schedule-power-control shutdown interface gigabitethernet 0/24
For AX2200S/AX1250S/AX1240S
(config)# schedule-power-control shutdown interface 0/24</td><td>- Turns off the power of the port by setting a port to the shutdown state during a scheduled time range.</td></tr>
<tr><td>(config-if)# schedule-power-control power-control port cool-standby</td><td>- Enables the power saving operation of a link-down port during a scheduled time range.</td></tr>
<tr><td>(config)# schedule-power-control port-led {economy | disable}</td><td>- Sets the luminance of the LED during a scheduled time range. Darkening is set as <code>economy</code>, with OFF as <code>disable</code>.</td></tr>
<tr><td>(config)# schedule-power-control time-range 1 weekly start-time fri 2000 end-time mon 0800 action enable</td><td>- Sets a scheduled time range. An example on the left is given to specify the schedule between 20:00 on Friday and 08:00 on Monday every week by entry No. 1.</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Rough standard of power saving effects</td><td colspan="2">The rough standard is based on the combined power saving functionality to be executed. See subsection 2.5.1, 2.5.2, 2.5.6, and 2.5.7.</td></tr>
<tr><td>Notes</td><td colspan="2">- Power saving functions other than the sleep functionality can be used with the specified schedule combined. However, the device sleep functionality preferentially operates when it is set.</td></tr>
<tr><td>Supplementary items</td><td colspan="2">- The date, each day, and infinity, as well as a day of the week, can be specified for the scheduled time range.
When specifying the date
date start-time <yymmdd> <hhmm> end-time <yymmdd> <hhmm>
When specifying each day
weekly start-time {sun | mon | tue | wed | thu | fri | sat} <hhmm>
end-time {sun | mon | tue | wed | thu | fri | sat} <hhmm>
When specifying every day
everyday start-time <hhmm> end-time <hhmm>
When specifying infinity (supported only in AX2500S)
infinity</td></tr>
<tr><td>Related documents</td><td colspan="2">AX2500S Software Manual Configuration Guide Vol.1
AX2200S Software Manual Configuration Guide Vol.1
AX1250S/AX1240S Software Manual Configuration Guide Vol.1</td></tr>
</table>

Note: The rough standard of the power saving effects described above is the difference between the power consumption level when a power saving functionality is not executed and when it is executed. It is based on the results of measurements obtained in the verification environment of our company under specific conditions. These results are not guaranteed under all conditions.

3. Power Consumption in the AX Series

3.1 Power consumption of the L2 switch (based on the Law Concerning the Rational Use of Energy measurement method)

The Law Concerning the Rational Use of Energy that was revised and enforced in July 2009 applies to box-type L2 switches, and reference energy consumption efficiency was established in 2011. The results of measuring the energy consumption efficiency of a box-type L2 switch in the AX series, based on the measurement method prescribed using the Law Concerning the Rational Use of Energy, are shown in Table *3.1-1*.

Table 3.1-1 Power consumption and energy consumption efficiency of a box-type L2 switch in the AX series#1 #2

Series name	Model name	Number of measurement ports	Frame transfer of 1,518 bytes		Energy consumption efficiency		
			Measurement result of power consumption (W)	Measurement result of the maximum effective transmission rate (Gbps)	Measurement result (W/Gbps)	L2-SW category A reference value in 2011 (W/Gbps)	L2-SW category A reference achievement rate in 2011 #3
AX2500S	AX2530S-24T	1GbE (UTP) x 24 1GbE (SFP-SX) x 4	34.1	28.0	1.2	2.2	183 %
	AX2530S-48T	1GbE (UTP) x 48 1GbE (SFP-SX) x 4	70.8	52.0	1.4	2.1	150 %
	AX2530S-24S4X	10GbE (SFPP-SR) x 4 1GbE (SFP-SX) x 24	57.7	64.0	0.9	1.5	166 %
AX2200S	AX2230S-24T	1GbE (UTP) x 24 1GbE (SFP-SX) x 4	26.3	28.0	0.9	2.2	244 %
	AX2230S-24P	1GbE (UTP) x 24 1GbE (SFP-SX) x 4	41.3	28.0	1.5	2.9	193 %
AX1200S	AX1250S-24T2C	1GbE (SFP-SX) x 2 FE (UTP) x 24	17.2	4.4	3.9	4.1	105 %
	AX1240S-24T2C	1GbE (SFP-SX) x 2 FE (UTP) x 24	16.4	4.4	3.7	4.1	110 %
	AX1240S-24P2C	1GbE (SFP-SX) x 2 FE (UTP) x 24	30.5	4.4	4.4	-- #4	-- #4
	AX1240S-48T2C	1GbE (SFP-SX) x 2 FE (UTP) x 48	27.7	6.8	4.1	4.7	114 %

#1 The results of the measurements are obtained under conditions where a power saving functionality is not executed.
#2 This measurement differs from the measurement conditions in which the rough standard of a power saving effect described in Chapter *2* was obtained.
#3 Reference achievement rate = (Reference value ÷ Measurement result) ×100 (%)
#4 According to the Law Concerning the Rational Use of Energy (revised in 2009), this applies to a device of within 16 in the maximum supply power rate of the PoE. The Law Concerning the Rational Use of Energy (revised in 2009) does not apply to the AX1240S-24P2C because the maximum supply power rate of the PoE is high (22.456).

Measurement conditions of the box-type L2 switch's energy consumption efficiency
(1) Measurement frame — L2 unicast, frame length (1,518 bytes), specified MAC address with the L2 header transmission/reception opposed, and all L2 data 0
(2) Ambient conditions — Ambient temperature 16-32°C
(3) Power conditions — Supply voltage 100 V AC ± 10%, 50 Hz
(4) Power consumption — Measures the effective power in an outlet plug when the effective transmission rate is maximized

Note: The measured power consumption value above is obtained when one model selected at random is measured at our company. Therefore, this result is not guaranteed under all conditions.

3.2 Power consumption of the L3 switch (based on a measurement method under our own conditions)

As of September 2011, the Law Concerning the Rational Use of Energy does not apply to the L3 switch. The measured power consumption results of the AX series L3 switch under our own conditions are shown below.

(1) Power consumption of the AX series chassis-type L3 switch

The measured power consumption result of the AX series chassis-type L3 switch under our own conditions is shown in Table *3.2-1*.

Table 3.2-1 Power consumption of the AX series chassis-type L3 switch #1 #2

Model name and measurement configuration	Number of measurement ports	Frame transfer of 256 bytes	
		Measurement result of the maximum effective transmission rate (Gbps)	Measurement result of power consumption (W)
AX6708S BCU-S1 x 1 Single configuration BSU-LA x 2 BSU double act NK10G-4RX x 8 PS-A11 x 4 Single configuration FAN-11 x 4 XFP-SR x 32 4 installed per NIF	10 GbE 32 ports	320.0	1374
AX6608S CSU-1A x 2 PSP double act NK10G-4RX x 8 PS-A11 x 2 Single configuration FAN-11 x 3 XFP-SR x 32 4 installed per NIF	10 GbE 32 ports	201.3	1014
AX6308S MSU-1A x 1 Single configuration NH1G-24T x 8 PS-A11 x 2 Single configuration FAN-11 x 3	1 GbE 192 ports	99.8	926

#1 The measurement result is obtained under conditions where a power saving functionality is not executed.

#2 This measurement differs from the measurement conditions in which the rough standard of a power saving effect described in Chapter *2* was obtained.

Measurement conditions of the chassis-type L3 switch's power consumption
Our own measurement conditions of the power consumption shown above are described below.
(1) Measurement frame L2 unicast, frame length (256 bytes), specified MAC address with the L2 header transmission/reception opposed, and arbitrary L2 data
(2) Ambient conditions Ambient temperature 16-32°C
(3) Power conditions Supply voltage AC 100V±10%, 50 Hz
(4) Power consumption Measures the effective power in an outlet plug when the effective transmission rate is maximized.

Note: The measurement values above are measured under the verification environment of our company. They vary depending on the module type, count, and operating environmental conditions. Therefore, this result is not guaranteed under all conditions.

(2) Power consumption of the AX series box-type L3 switch

The measured power consumption result of the AX series box-type L3 switch under our own conditions is shown in Table *3.2-2*.

Table 3.2-2 Power consumption of the AX series box-type L3 switch #1 #2

Series name	Model name	Number of measurement ports	Frame transfer of 1518 bytes	
			Measurement result of the maximum effective transmission rate (Gbps)	Measurement result of power consumption (W)
AX3830S	AX3830S-44XW	10GbE (SFPP-CU1M) x 44 1GbE (UTP) x 4	444.0	146.7
	AX3830S-44X4QW	40GbE (QSFP-SR4) x 4 10GbE (SFPP-CU1M) x 44 1GbE (UTP) x 4	604.0	188.9
AX3650S	AX3650S-24T6XW	10GbE (SFPP-SR) x 6 1GbE (UTP) x 24	84.0	72.7
	AX3650S-20S6XW	10GbE (SFPP-SR) x 6 1GbE (UTP) x 4 1GbE (SFP-SX) x 20	84.0	76.1
	AX3650S-48T4XW	10GbE (SFPP-SR) x 4 1GbE (UTP) x 48	88.0	82.1
AX3640S	AX3640S-48T2XW	10GbE (XFP-SR) x 2 1GbE (UTP) x 48	68.0	116.3
	AX3640S-48TW	1GbE (UTP) x 44 1GbE (SFP-SX) x 4	48.0	103.8
	AX3640S-24T2XW	10GbE (XFP-SR) x 2 1GbE (UTP) x 20 1GbE (SFP-SX) x 4	44.0	69.7
	AX3640S-24S2XW	10GbE (XFP-SR) x 2 1GbE (SFP-SX) x 24	44.0	57.2
	AX3640S-24TW	1GbE (UTP) x 20 1GbE (SFP-SX) x 4	24.0	58.5
	AX3640S-24T	1GbE (UTP) x 20 1GbE (SFP-SX) x 4	24.0	55.7
	AX3640S-24SW	1GbE (SFP-SX) x 24	24.0	46.0

#1 The measurement result is obtained under conditions where a power saving functionality is not executed.
#2 This measurement differs from the measurement conditions in which the rough standard of a power saving effect described in Chapter *2* was obtained.

Measurement conditions of the box-type L3 switch's energy consumption efficiency
Our own measurement conditions of the power consumption shown above are described below.
(1) Measurement frame L2 unicast, frame length (1,518 bytes), specified MAC address with the L2 header transmission/reception opposed, and all L2 data 0
(2) Ambient conditions Ambient temperature 16-32°C
(3) Power conditions Supply voltage AC 100V±10%, 50 Hz
(4) Power consumption Measures the effective power in an outlet plug when the effective transmission rate is maximized

Note: The measured power consumption value above is obtained when one model selected at random is measured at our company. Therefore, this result is not guaranteed under all conditions.

Appendix A Power Saving Functionality Configuration Command List

Appendix A.1 Power saving functionality configuration command list for the AX6700S, AX6600S, and AX6300S series

A list of power saving functionality configuration commands for the AX6700S, AX6600S, and AX6300S series and operation when the commands are set to the default setting are shown in Table *A.1-1*.

Table A.1-1 Power saving functionality configuration command list for the AX6700S, AX6600S, and AX6300S series #1 #2

Power saving functionality	Configuration command		
	Full-time execution	Automatic control based on scheduled settings	Automatic control based on traffic amount
Unused port power feed OFF functionality	**shutdown** (Default: Power feed ON)	**schedule-power-control shutdown interface** (Default: Power feed ON)	--
Unused NIF power feed OFF functionality	**no power enable nif** (Default: Power feed ON)	**schedule-power-control shutdown nif** (Default: Power feed ON)	--
Standby switch unit power feed OFF functionality#3	**redundancy {max-bsu | max-psp}** (Default: Number of BSUs in operation: 3, number of PSPs in operation: 2)	**schedule-power-control {max-bsu | max-psp}** (Default: Number of BSUs in operation: 1, number of PSPs in operation: 1)	**adaptive-power-control {max-bsu | max-psp}** (Default: Number of BSUs in operation: 1, number of PSPs in operation: 1)
	redundancy {standby-bsu | standbye-psp } (Default: Power feed ON)	**schedule-power-control {standby-bsu | standby-psp}** (Default: Power feed OFF)	**adaptive-power-control {standby-bsu | standby-psp}** (Default: Power feed OFF)
Standby NIF power feed OFF functionality	**redundancy nif-group max-standby-nif** (Default: Two NIFs in an active state)	**schedule-power-control redundancy nif-group max-standby-nif** (Default: Only one NIF in an active state)	--
LED OFF functionality	**system port-led** (Default: Lights)	**schedule-power-control port-led** (Default: OFF)	**adaptive-power-control port-led** (Default: OFF)
Switching to power saving mode while online	**power-control mode** (Default: Normal power)	**schedule-power-control mode** (Default: The power consumption of the BSU/PSP is reduced.)	**adaptive-power-control mode** (Default: The power consumption of the BSU/PSP is reduced.)

#1 Legend --: Not supported

#2 The AX6300S series has support for the unused port power feed OFF functionality, unused NIF power feed OFF functionality, and LED OFF functionality, being executed at any time.

#3 The AX6700S series is `max-bsu` and `standby-bsu`. The AX6600S series is `max-psp` and `standby-psp`.

Appendix A.2 Power saving functionality configuration command list in AX3830S/AX3650S

A list of power saving functionality configuration commands for the AX3830S/AX3650S series and operation when the commands are set to the default settings are shown in .Table *A.2-1* .

Table A.2-1 Power saving functionality configuration command list in AX3830S/AX3650S #1

Power saving functionality	Configuration command	
	Full-time execution	Automatic control based on scheduled settings
Unused port power feed OFF functionality	**shutdown** (Default: Power feed ON)	**schedule-power-control shutdown interface** (Default: Power feed ON)
Link-down port power saving functionality	**power-control port cool-standby** (Default: Normal power)	**schedule-power-control port cool-standby** (Default: Normal power)
Sleep functionality	--	**schedule-power-control system-sleep** (Default: The device does not enter the sleep state irrespective of a scheduled time range.)
LED luminance setting functionality	**system port-led** (Default: Lights)	**schedule-power-control port-led** (Default: OFF)

#1 Legend --: Not supported

Appendix A.3 Power saving functionality configuration command list for the AX3640S series

A list of power saving functionality configuration commands for the AX3640S series and operation when the commands are set to the default settings are shown in Table *A.3-1*.

Table A.3-1 Power saving functionality configuration command list in AX3640S

Power saving functionality	Configuration command	
	Full-time execution	Automatic control based on scheduled settings
Unused port power feed OFF functionality	**shutdown** (Default: Power feed ON)	**schedule-power-control shutdown interface** (Default: Power feed ON)

Appendix A.4 Power saving functionality configuration command list for the AX2500S, AX2200S, AX1250S, and AX1240S series

A list of power saving functionality configuration commands for the AX2500S, AX2200S, AX1250S, and AX1240S series, and operation when the commands are set to the default settings are shown in Table Appendix *A.4-1*.

Table Appendix A.4-1 Power saving functionality configuration command list for the AX2500S, AX2200S, AX1250S, and AX1240S series #1

Power saving functionality	Configuration command	
	Full-time execution	Automatic control based on scheduled settings
Unused port power feed OFF functionality	**shutdown** (Default: Power feed ON)	**schedule-power-control shutdown interface** (Default: Power feed ON)
Link-down port power saving functionality	**power-control port cool-standby** (Default: Normal power)	**schedule-power-control port cool-standby** (Default: Normal power)
Sleep functionality#2	--	**schedule-power-control system-sleep** (Default: The device does not enter the sleep state irrespective of a scheduled time range.)
Restoration option of the sleep functionality#3	--	- Restoration option based on WOL packet detection **schedule-power-control wakeup-option wol interface** <interface id list> **Contents of parameter** <interface id list> Specifies a WOL packet reception detection port. See the supplementary item in subsection *2.5.4* for the port that can be specified. - Restoration option based on port link-up detection **schedule-power-control wakeup-option linkup interface** <interface id list> [**down-detect** <min>] **Contents of parameter** <interface id list> Specifies a link-up detection port; all ports can be specified. [**down-detect** <min>] Sets the monitoring time, required from when all set ports are linked down until they are shifted to the sleep state, in minutes. The range of value is 1 to 60. (Default: 5) (Default: A sleep state is not canceled by WOL packet reception detection or link-up detection.)
LED luminance setting functionality	**system port-led** (Default: Lights)	**schedule-power-control port-led** (Default: Lights)
Semi-fanless functionality	**system fan-control** (Default: The fan operates at all times.)	--

#1 Legend --: Not supported

#2 The AX2200S series does not support the sleep functionality.

#3. The restoration option of the sleep functionality is supported only by the AX2500S series.

Edition 3 issued on September 28, 2012

ALAXALA Networks Corporation
Network Technical Support

Shinkawasaki Mitsui Bldg. West Tower 1-1-2
Kashimada, Saiwai-ku, Kawasaki-shi, Kanagawa,
212-0058, Japan
http://www.alaxala.com/en/