

**Datasheet**

ALAXALA Fast Ethernet Layer 2 switches

## AX1240S Series

### 1. Overview

The ALAXALA AX1240S series of Fast Ethernet Layer 2 switches offers the following three models:



**Figure 1 AX1240S-24T2C**



**Figure 2 AX1240S-48T2C**



**Figure 3 AX1240S-24P2C**

#### 1.1 Product concept

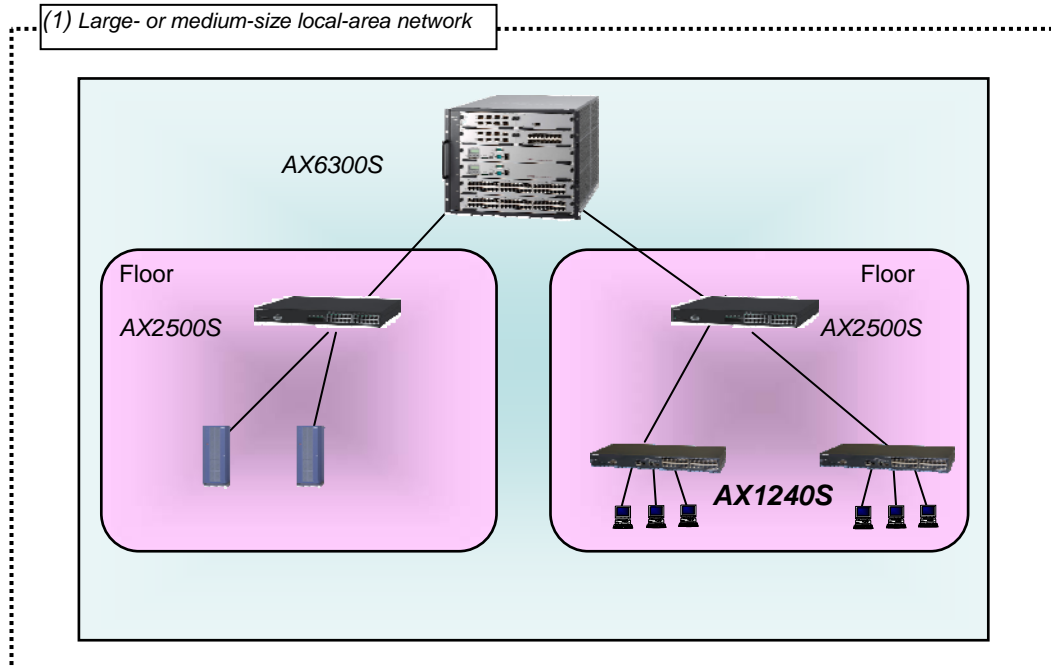
The AX1240S series of switches achieves Fast Ethernet floor LANs and workgroup LANs.

- Low-end models in the AX series product lineup, covering network edges
- Features incorporated from the high-end AX series; system interoperability (functional consistency); unified interconnectivity and operability
- High reliability, high security, and high operability based on a guaranteed network

## 1.2 Usage examples

The following example shows the use of the switches as floor switches for large- or medium-size local-area network.

Figure 4 shows an example configuration and the switch usage when switches are used with an AX6300S series switch in a local-area network.



**Figure 4 Example of using switches in a large- or medium-size local-area network**

**Table 1 Switch usage example**

Target market	Switch usage example	Points
Large-size local-area network	<ul style="list-style-type: none"> <li>• Workgroup switch for terminal connections</li> <li>• Switch that concentrates network lines on a floor for which Fast Ethernet is appropriate</li> </ul>	<ul style="list-style-type: none"> <li>• Operability unified by AX series lineup</li> <li>• Rich security and authentication functionality (IEEE 802.1X, Web authentication, MAC-based authentication)</li> <li>• Stable operation and enhanced highly available functionality (Autonomous Extensible Ring Protocol (transit nodes), GSRP-aware, link aggregation, RSTP, etc.)</li> <li>• IPv6 support (MLD snooping)</li> <li>• Elimination of power cables by PoE</li> </ul>
Medium- and small-size local-area networks	<ul style="list-style-type: none"> <li>• Core switch (Connected to base routers which are connected to the center router)</li> <li>• Floor switch</li> <li>• Workgroup switch</li> </ul>	

## 2. Features

### 2.1 Features of the AX1240S series

#### (1) Unified lineup

- Low-end switch provision
  - The AX1240S series switches, which are low-end Fast Ethernet Layer 2 switches, cover network edges and provide consistent connectivity, operability, and interoperability throughout the AX series.

#### (2) Robust security

- Authentication and quarantine solutions
  - Authentication methods such as IEEE 802.1X, Web authentication, and MAC-based authentication enable individual PCs to be authenticated and placed into a VLAN, while maintaining the freedom of the physical configuration of network edges.
  - IEEE 802.1X port-based authentication (static) restricts and releases communicable packets by using status monitoring, which gives permission for full access communication only to terminals that conform to a security policy.
  - Web authentication by using the RSA SecurID (Note 1) one-time password authentication functionality can improve network access security. PIN code initial registration and token code re-entry are also supported (Note 2).
  - Devices such as printers can be authenticated by using MAC-based authentication.
  - Fixed-IP address terminals also can be authenticated by using the fixed VLAN modes of MAC-based authentication and Web authentication. Moreover, port trunking allows wireless terminals or similar terminals that have both untagged frames and tagged frames to be authenticated.
  - Multistep authentication (Note 3), which performs terminal authentication and user authentication in two steps, is supported as the network authentication functionality.
- Secure Wake-on-LAN
  - This functionality allows access to your PC from outside the company, whether you are at home or on a business trip. You can use a Web browser to access a switch and, via the in-house network, turn on or off the power to a desktop PC within the company (Note 4).
- Unauthorized DHCP servers and terminals with fixed IP addresses are excluded from networks.
  - Robust security measures can be provided via DHCP snooping, which eliminates unauthorized DHCP servers and terminals with fixed IP addresses.

(Note 1) RSA, the RSA logo, and SecurID are trademarks or registered trademarks of RSA Security Inc. in the United States and other countries.

(Note 2) For this functionality, you must purchase an optional software license separately.

(Note 3) In this authentication, user authentication (IEEE 802.1X or Web authentication) is performed after terminal authentication (MAC-based authentication) is completed.

(Note 4) For this functionality, you must purchase an optional software license separately.

#### (3) High reliability for configuring mission-critical networks

- High-quality devices
  - High reliability through carefully selected parts and strict design and inspection requirements
- Variety of redundant network configurations
  - High-speed path switching
    - Standard features such as Autonomous Extensible Ring Protocol (transit nodes), link aggregation (IEEE 802.3ad), and Rapid Spanning Tree Protocol, and proprietary features such as GSRP-aware allow a redundant high-reliability network to be built. Uplink redundancy, which can build redundant configurations without using Spanning Tree Protocol, is supported.
    - QoS, which gives priority to important packets and audio packets, is supported.
- Layer 2 loop avoidance
  - The UDLD functionality prevents loops at the spanning tree or frame loss at link aggregation.
  - The Layer 2 loop detection functionality detects improperly connected devices on a network, which helps prevent loops.

- (4) Support for combo ports and gigabit uplinks
- Gigabit uplink
    - Two ports can be used simultaneously in combination with 1000BASE-T ports or in combination with 1000BASE-X (SX, SX2, LX, BX, LH) ports to support various network environments.
- (5) Excellent network management, maintenance, and operation
- CFM (Connectivity Fault Management) (Ether OAM) Continuity checks (CC), loopback, and link traces can perform connectivity monitoring and failure management at the Layer 2 level.
  - In addition to the basic MIB-II, many other MIBs, including RMON are supported.
  - Improved configuration compatibility with the AX2400S and AX3600S series simplifies the operation of the entire system.
  - SD memory cards
    - Log information storage and software update are supported.
  - Console ports are located on the front panel.
  - Device cooling system fit for suitable operation (AX1240S-48T2C and AX1240S-24P2C) are adopted.
    - The air intake on the side and the air exhaust on the rear reduce the effects of heat vented from other devices, and enable stable operation.
- (6) Compact design and low environmental impact
- Compact chassis
    - Compact design with a maximum depth of 35.0 cm and a maximum height of 4.3 cm (1U)
  - RoHS is applied, and the environmental impact is reduced.
- (7) Fanless design
- Fanless (AX1240S-24T2C)
    - The number of problems caused due to dust sucked into devices decreases, and a quiet office environment (without noise) is achieved.
- (8) Elimination of power cables by PoE
- PoE devices such as IP telephone and wireless LAN AP can be handled (AX1240S-24P2C).
    - Because the work of installing power cables is not required, the inconvenience of increasing cables is removed, the costs for installing power cables are reduced, and the network construction period is shortened.
    - PoE (IEEE 802.3af) full power supply (maximum: 369.6 W) allows Class 3 (maximum: 15.4 W) power-receiving devices to be connected to up to 24 ports. Because PoE Plus (IEEE 802.3at) is also supported, Class 4 (maximum 30.0 W) power-receiving devices can be connected to up to 12 ports.
- (9) IPv6 support
- MLD snooping is supported, which can control the distribution of IPv6 multicast packets.
- (10) Precise QoS
- While functioning as Layer 2 switches, the AX1240S series of switches can identify Layer 2 flows, Layer 3 flows, and Layer 4 flows, and then can control priority and bandwidth. ToS or CoS marking and mapping are supported, and enable optimal QoS processing and distribution of packets according to the features of applications such as IP telephone.

## (11) Power saving

- LED operation is controlled in three steps: normal brightness, power saving brightness (operation with lower brightness than normal), and disabled.
  - LEDs can be set to blink or turn on in normal brightness when consoles are connected to the switches, ports are in the link-up state, and SD memory cards are inserted. The settings can be also changed so that LEDs automatically turn off after operations are completed.
- Port power saving
  - To achieve power saving, the power to a port is shut off when a link-down state is detected, or when a port is blocked (that is, a port for which the `shutdown` setting is configured by using configuration commands) (Note 5).
- Scheduling
  - The switches can switch automatically to a sleep state, and be woken up from the sleep state, in accordance with the schedule settings for long holidays, Saturdays, Sundays, public holidays, and evenings.
  - The above LED operation and port power saving also can be set up by schedule settings.

(Note 5) The SFP port supports port power saving only when a port is blocked.

## 3. Specifications

### 3.1 Switch specifications

**Table 2 Switch specifications**

Specifications			AX1240S-24T2C	AX1240S-48T2C	AX1240S-24P2C
Switching capacity			8.8 Gbit/s	13.6 Gbit/s	8.8 Gbit/s
Frame processing performance (Mpacket/s) (Note 1)	Ethernet (Layer 2 forwarding)		6.5	10.1	6.5
Number of network interfaces	10BASE-T, 100BASE-TX, 1000BASE-T or 1000BASE-SX, SX2, LX, BX, LH (SFP) (Note 2)		2	2	2
	10BASE-T, 100BASE-TX		24	48	--
	10BASE-T, 100BASE-TX [PoE/PoE Plus]		--	--	24 (Note 3)
Number of memory card slots			SD memory card x 1		
Power supply requirements	Voltage	Rated input voltage (V)	100 to 120 AC/ 200 to 240 AC	100 to 120 AC/ 200 to 240 AC	100 to 120 AC/ 200 to 240 AC
		Variation range (V) (Note 4)	90 to 132 AC/ 180 to 264 AC	90 to 132 AC/ 180 to 264 AC	90 to 132 AC/ 180 to 264 AC
	Frequency (Hz)		50/60	50/60	50/60
	Maximum input current (A)		0.18 at 100 V AC 0.10 at 200 V AC	0.31 at 100 V AC 0.17 at 200 V AC	4.6 at 100 V AC 2.4 at 200 V AC
	Maximum power consumption (W)		18/21 (Note 5)	30/33 (Note 5)	450/453 (Note 5)
	Maximum PoE power supply (W)		--	--	369.6/switch, 30.0/port (Note 3)
Calorific power (kJ/h)			65/76 (Note 5)	108/119 (Note 5)	1620/1631 (Note 5)
Items of Law Regarding the Rationalization of Energy Use (Note 6)	Energy efficiency (W/(Gbit/s))		Class A 3.7 (Reference value: 4.1)	Class A 4.1 (Reference value: 4.7)	-- (Note 7)
	Maximum effective transmission speed		4.4 Gbit/s	6.8 Gbit/s	-- (Note 7)
	Speed and number of ports when measuring	1 Gbit/s	2	2	-- (Note 7)
100 Mbit/s		24	48	-- (Note 7)	
Equipment requirements	External dimensions W x D x H (mm) (height [U])		445 x 200 x 43 (1U)	445 x 250 x 43 (1U)	445 x 350 x 43 (1U)
	Weight (kg) (main unit only)		2.8	3.8	5.8
Environmental requirements	Temperature	Acceptable operating range	0°C to 45°C		
		When not operating (not energized)	-10°C to 50°C		
		During storage and transportation	-25°C to 65°C		
	Relative humidity	Acceptable operating range	10% to 90% (no condensation)		
		When not operating (not energized)	8% to 90% (no condensation)		
		During storage and transportation	5% to less than 100% (no condensation)		
Suspended particulates		Suspended particulates smaller than approx. 10 microns: 0.15 mg/m <sup>3</sup>			
Vibration (m/s <sup>2</sup> )		No more than 2.45			
Applicable standards	EMI standard		VCCI Class A		
	Harmonic current emission standard		JIS C61000-3-2		
	EMS standard		JEITA IT-3001		
	Safety standard		UL60950-1 compliant		

(Note 1) Measurement conditions are as follows:

- Physical media: 1000BASE-T and 1000BASE-X
- Frame type: Layer 2 forwarding. No flooding.
- Frame length: 64 bytes
- QoS and filters: Not set

(Note 2) Combo port (10BASE-T, 100BASE-TX, 1000BASE-T, 1000BASE-X) x 2 ports. Used exclusively per combo port (cannot be used simultaneously).

(Note 3) When the power class of the powered device is Class 4 (30.0 W), the maximum number of ports that can supply power is 12 ports.

(Note 4) This is the range within which normal operation is guaranteed.

(Note 5) When two 1000BASE-LH (SFP) ports are used, the values are those written on the right.

(Note 6) Values measured by using methods specified by the Law Regarding the Rationalization of Energy Use

(Note 7) AX1240S-24P2C is excluded from the application of the Law Regarding the Rationalization of Energy Use (2009) because the PoE power supply rate exceeds the maximum of 16.

## 3.2 Functionality

**Table 3 List of functionality**

Category	Functionality		Relevant standards	Remarks
LAN	Ethernet	10BASE-T, 100BASE-TX	IEEE 802.3, IEEE 802.3u	
		10BASE-T, 100BASE-TX (PoE)	IEEE 802.3af	
		10BASE-T, 100BASE-TX (PoE Plus)	IEEE 802.3at (Draft3.1)	
		10BASE-T, 100BASE-TX, 1000BASE-T	IEEE 802.3, IEEE 802.3u IEEE 802.3ab	
		1000BASE-X (SX, LX)	IEEE 802.3z	
		1000BASE-X (SX2)	--	
		1000BASE-X (BX)	IEEE 802.3ah	
		1000BASE-X (BX (40 km support version))	--	
		1000BASE-X (LH)	--	
	Flow control	IEEE 802.3x		
Auto negotiation extended functionality	10BASE-T, 100BASE-TX, 1000BASE-T down shift	--	(Note 1)	
IEEE 802.3ad link aggregation		IEEE 802.3ad		
Jumbo frame		--		
Layer 2 functionality	Transparent bridge		--	
	VLAN	Port VLAN	IEEE 802.1Q	
			IEEE 802.1u	
			IEEE 802.1v	
		VLAN tagging	IEEE 802.1Q	
		Protocol VLAN	--	
	MAC VLAN	--		
	Inter-port relay blocking functionality		--	
	Spanning Tree Protocol	STP	IEEE 802.1D, IEEE 802.1t	
			IEEE 802.1w	
			IEEE 802.1s	
			--	
			--	
			--	
			--	
	Uplink redundancy		--	
	Autonomous Extensible Ring Protocol		--	Only transit nodes are supported.
	IGMP/MLD snooping		draft-ietf-magma-snoop-12.txt	
	Storm control		--	
	IEEE 802.3ah, UDLD		IEEE 802.3ah	
L2 loop detection		--		
CFM (Connectivity Fault Management) (Ether OAM)		IEEE 802.1ag		
Additional functionality	Filter	Flow detection	Layer 2 conditions	--
			Layer 3 conditions (IPv4)	--
			Layer 4 conditions	--
	QoS	Flow detection	Layer 2 conditions	--
			Layer 3 conditions (IPv4)	--
			Layer 4 conditions	--
		Marker	User priority updating	--
			DSCP updating	--
		Priority determination	CoS mapping	--
	Discard control	Tail drop	--	

Category	Functionality			Relevant standards	Remarks		
	Shaper	Scheduling	PQ	--			
			WRR	--			
			WFQ	--			
			PQ + WRR	--			
			Port bandwidth control	--			
	Diff-Serv			--			
	Layer 2 authentication	IEEE 802.1X	Port-based authentication (static)	IEEE 802.1X, RFC 2865, RFC 2866, RFC 2868, RFC 2869, RFC 3579, RFC 3580, RFC 3748			
			Port-based authentication (dynamic)				
			VLAN-based authentication (dynamic)				
		Web authentication	Fixed VLAN mode	URL redirection	--		
				Keep Alive functionality	--		
				Internal DB	--		
				RADIUS linkage	--		
				Dynamic VLAN mode	--		
			Dynamic VLAN mode	URL redirection	--		
				Internal DB	--		
				RADIUS linkage	--		
			Legacy mode	Internal DB	--		
				RADIUS linkage	--		
				One-time password authentication	--	(Note 5)	
			DHCP server	RFC 2131 RFC 2132		DHCP option	
			MAC-based authentication	Fixed VLAN mode	Internal DB	--	
					RADIUS linkage	--	
					Dynamic VLAN mode	--	
		Dynamic VLAN mode		Internal DB	--		
				RADIUS linkage	--		
		Legacy mode		Internal DB	--		
RADIUS linkage				--			
Mixed authentication on a port		IEEE 802.1X, Web authentication, MAC-based authentication	--				
Common to authentication		Limited number of authentications	--	(Note 6)			
		Forced authentication functionality	--	(Note 4)			
		Multistep authentication	--				
Secure Wake on-LAN			--	(Note 5)			
DHCP snooping			--				
Port mirroring		Local	--	Only one port can be specified for the mirror port.			
Reliability	Environmental monitoring			--			
	Self diagnosis (MD)			--			
	Redundancy switchover linkage function	GSRP-aware	--				
Network management	SNMP	v1, v2c	RFC 1155, RFC 1157, RFC 1901, RFC 1902, RFC 1903, RFC 1904, RFC 1905, RFC 1906, RFC 1907, RFC 1908				
	MIB-II, Interface MIB		RFC 1213, RFC 2233, RFC 2863 (some MIBs only)				
	Ethernet MIB		RFC 1493 (some MIBs only), RFC 1643 (some MIBs only), RFC 3621				
	CFM-MIB		IEEE 802.1ag				
	RMON		RFC 1757				
	Private MIB		--	(Note 2)			



Category	Functionality		Relevant standards	Remarks	
Operation and maintenance	Connection with operation terminals	Serial (Console)	--		
	Configuration	CLI	--		
	Security	Login authentication	Password	--	
			Host address	--	
			RADIUS	RFC 2865	
			One-time password authentication	--	(Note 5)
	Collection of management information	Display of switch/interface status		--	
		Operation message log		--	
		LLDP		IEEE 802.1AB, D6.0	
		Statistical information on a line-by-line basis		--	
	NTP		RFC 2030	(Note 3)	
	Command-free maintenance functionality		--		
	Power saving functionality	LED automatic brightness change		--	
		Port power saving		--	(Note 7)
Dynamic power saving		Switch sleep	--		
		Port power saving	--	(Note 7)	
LED brightness control		--			

(Note 1) Software-based execution

(Note 2) The differences from the AX2400S and AX3600S series are as follows:

- |                 |                      |                               |
|-----------------|----------------------|-------------------------------|
| - axsDHCP group | - axsGSRPMIB group   | - axsOADP group               |
| - axsFLOW group | - axs2430sManagement | - ICMP group (HP private MIB) |

(Note 3) Only the SNTP client functionality is supported.

(Note 4) This feature is enabled only for RADIUS authentication.

(Note 5) You must purchase optional software licenses separately.

(Note 6) Only Web authentication and MAC-based authentication are supported.

(Note 7) The SFP port supports the port power saving only when a port is blocked.

## 4. Ordering Information

**Table 4 Ordering information**

No.	Model name	Abbreviated name	Basic specifications
<b>LAN switch</b>			
1	AX-1240-24T2C-XX	12V-24T2C	AX1240S-24T2C box-type Layer 2 switch - Fast Ethernet: 24 ports (10/100BASE-TX x 24) - Gigabit Ethernet: 2 ports (10/100/1000BASE-T or 1000BASE-X (SFP) used with exclusion (port basis) x 2) - Equipped with L2 software (no SSH) - SD card slot x 1 - Supports AC power supply
2	AX-1240-24P2C-XX	12V-24P2C	AX1240S-24P2C box-type Layer 2 switch - Fast Ethernet: 24 ports (10/100BASE-TX (PoE, PoE Plus) x 24) - Gigabit Ethernet: 2 ports (10/100/1000BASE-T or 1000BASE-X (SFP) used with exclusion (port basis) x 2) - Equipped with the L2 software (no SSH) - SD card slot x 1 - Supports AC power supply
3	AX-1240-48T2C-XX	12V-48T2C	AX1240S-48T2C box-type Layer 2 switch - Fast Ethernet 48 ports (10/100BASE-TX x 48) - Gigabit Ethernet 2 ports (10/100/1000BASE-T or 1000BASE-X (SFP) used with exclusion (port basis) x 2) - Equipped with the L2 software (no SSH) - SD card slot x 1 - Supports AC power supply
<b>Option</b>			
1	AX-F0110-SD1GX	SD1G	1 G SD memory card (Note 1)
<b>Optical transceiver</b>			
1	AX-F6244-3S1SX	SFP-SX	SFP for 1000BASE-SX (MMF: 2 m to 550 m)
2	AX-F6244-3S1S2X	SFP-SX2	SFP for 1000BASE-SX2 (MMF: 2 m to 2 km)
3	AX-F6244-3S1LX	SFP-LX	SFP for 1000BASE-LX (MMF: 2 m to 550 m) (SMF: 2 m to 5 km)
4	AX-F6244-3SB1UX	SFP-BX1U	SFP for 1000BASE-BX10-U, single core bidirectional single-mode optical fiber (upstream) (SMF: 0.5 m to 10 km)
5	AX-F6244-3SB1DX	SFP-BX1D	SFP for 1000BASE-BX10-D, single core bidirectional single-mode optical fiber (downstream) (SMF: 0.5 m to 10 km)
6	AX-F6244-3SB4UX	SFP-BX4U	SFP for 1000BASE-BX40-U, single core bidirectional single-mode optical fiber (upstream) (SMF: 0.5 m to 40 km)
7	AX-F6244-3SB4DX	SFP-BX4D	SFP for 1000BASE-BX40-D, single core bidirectional single-mode optical fiber (downstream) (SMF: 0.5 m to 40 km)
8	AX-F6244-3S1LHX	SFP-LH	SFP for 1000BASE-LH (SMF: 2 m to 70 km)
<b>Optional software license</b>			
1	AX-P1240-F1X	OP-WOL	Secure Wake-on-LAN license for AX1240S series
2	AX-P1240-F2X	OP-OTP	RSA SecurID linkage license for AX1240S series

(Note 1) The software and script are not installed when shipped from the factory.

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**[Editions History]**

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Note 1: SSH functionality is subject to export control regulations, and might be unavailable for use with exported products.

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**ALAXALA Networks Corporation**

<http://www.alaxala.com/en/>

**Shinkawasaki Mitsui Bldg. West Tower,  
890 Kashimada,  
Saiwai-ku, Kawasaki-shi, Kanagawa 212-0058  
Japan**

**Contact URL:**

<http://www.alaxala.com/en/contact/>

**Contact:**

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