



# **NX-SG3750 Cloud Managed Security Gateway Switch**

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## Preface

Thank you for using our products. This manual will guide you through the installation of the device.

This manual describes the functional and physical features and provides the device installation steps, hardware troubleshooting, module technical specifications, and specifications and usage guidelines for cables and connectors.

## Audience

It is intended for the users who have some experience in installing and maintaining network hardware. At the same time, it is assumed that the users are already familiar with the related terms and concepts.

## Obtaining Technical Assistance

Website:<https://www.nodexon.com/>  
Technical Support Website:<https://nodexon.com/support>  
Community:<http://www.nodexon.com/community.com>  
Technical Support Email:[info@nodexon.com](mailto:info@nodexon.com)  
Case Portal :<https://www.nodexon.com/caseportal>

## Related Documents

Documents	Description
Configuration Guide	Describes network protocols and related mechanisms that supported by the product, with configuration examples.
Command Reference	Describes the related configuration commands, including command modes, parameter descriptions, usage guides, and related examples.

## Symbol Conventions

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 Means reader take note. Notes contain helpful suggestions or references.

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 Means reader be careful. In this situation, you might do something that could result in equipment damage or loss of data.

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## Product Overview

Nodexon SG series breakout gateway employs the global-leading semiconductor technologies and communication control technologies, and is an independently developed data communication product of Nodexon Networks with independent intellectual property right. The breakout gateway products of Nodexon are completely developed as per international standards and are similar to the mainstream breakout gateway products in the international market. By reading this manual, network administrator being familiar with mainstream breakout gateway configuration commands can easily use this product without training.

### Nodexon SG Series Breakout Gateways

#### Nodexon SG3750 Breakout Gateway

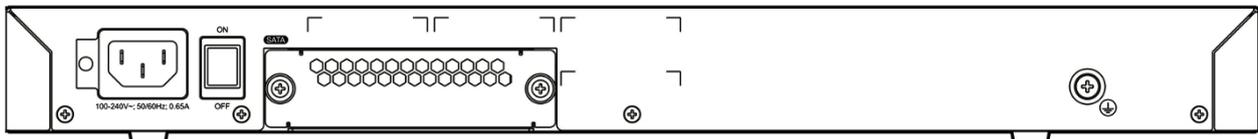
##### Appearance of Nodexon SG3750 Breakout

**Gateway** Figure 1-1 Front Panel of Nodexon SG3750

Breakout Gateway



Figure 1-2 Backpanel of Nodexon SG3750 Breakout Gateway



#### Specifications of Nodexon SG3750 Breakout Gateway

■ Table 1-1 Specifications of Nodexon SG3750 Breakout Gateway

Item	Description
Storage	DDR4 SDRAM: 2 GB
	BOOTROM: 8 MB
	eMMC: 8 GB
	SATA: 1 TB.
I/O Setup	Supports 8 Gigabit copper ports, 1 Gigabit fiber port, and 1 tenGigabit fiber port. All of them support WAN/LAN switchover. By default, port 6, 7, 9 are WAN ports, while the port 0, 1, 2, 3, 4, 5, 8 are LAN ports.
	The Gigabit copper ports are 10/100/1000 M adaptive and support automatic recognition of the network cables and the

	<p>cross-over cables.</p> <p>The Gigabit fiber port is supported on the 1000BASE-SX/LX/ZX mini GBIC module and GE-SFP-LX20/LH40-BIDI SFP module.</p> <p>The tenGigabit fiber port is supported on the XG-SFP-SR-MM850, XG-SFP-LR-SM1310, XG-SFP-ER-SM1550 and BIDI SFP modules.</p>
	One management port, which is the GE 0/0 combo port. The MGMT port supports 10/100/1000 M adaptive and automatic recognition of the network cables and the cross-over cables.
	One console port
	One USB2.0 port
<b>BYPASS</b>	Not supported
<b>Hardware Disk Module</b>	One 1TB hardware disk is provided.
<b>Expansion Module</b>	Not supported
<b>Hot-swapping</b>	Hard disk hot swapping is not supported.
<b>Interface Standard</b>	<p>Ethernet: 10Base-T/100Base-TX/1000Base-TX, 1000BASE-SX/LX/ZX, 10GBASE-SR/LR/ZR</p> <p>Console port: RS-232</p>
<b>Dimension (W x H x D)</b>	440mm x 43.6mm x 200mm (excluding the foot pad)
<b>Voltage</b>	100VAC to 240VAC; 50/60 Hz, 0.65A
<b>Power Consumption</b>	Less than 25W
<b>Working Environment</b>	<p>Temperature: 0°C to 45°C (32°F to 113°F)</p> <p>Humidity: 10% to 90% RH (non-condensing)</p>

-  Not all USB disks are supported. The Kingston USB disk with FAT 32 is recommended.
-  Please avoid the vibration and collision in the process of moving and usage.
-  Products should be transported in original packets.
-  Format a hardware disk to *.EXT3* before installing it.
-  To power off the device, please turn off the power button. Do not remove the power cable until the PWR led turns off, or else the hardware disk will be damaged.
-  The 10GE fiber port does not support the direct connection between two SG3750 devices via the SFP module or fiber cables.

### LED Indicators of Nodexon SG3750 Breakout Gateway

■ Table 1-2 LED Indicators of Nodexon SG3750 Breakout Gateway

LED Indicator	Working status
PWR	Solid green indicates that the power module is working properly.

	Off indicates that the power module is not powered on or is faulty.
<b>SYS</b>	Blinking green indicates the system is being initialized. Solid green indicates system initialization has completed. Solid red indicates system warning.
<b>SATA</b>	Solid green indicates the SATA disk is installed. Blinking green indicates the SATA disk is reading or writing data.
<b>0-7 Copper Port Link/ACT Indicator</b>	Solid orange indicates the 10/100/1000 M link that the port connects to is up. Blinking green indicates the port is transceiving data.
<b>0-7 Copper Port Speed Indicator</b>	Solid orange indicates the 1000 M link that the port connects to is up. Off indicates the 10/100 M link that the port connects to is up.
<b>8F-9F Fiber Port Indicator</b>	Solid green indicates the link that the port connects to is up. Blinking green indicates the port is transceiving data.

## Features of Nodexon SG Series Breakout Gateway

### Full Support to Extensive Protocols

- Nodexon SG series breakout gateway is applicable to different network environment as it provides full support to extensive protocols:
- Providing RJ45 port and supporting Ethernet protocol and ARP protocol;
- Supporting TCP/IP protocol stack at the network layer (IP, ICMP, IGMP, TCP, UDP and so on);
- Supporting multiple IP-based dynamic routing protocol such as RIP (V1/V2), OSPF;
- Supporting the network management protocol of SNMP;
- Supporting TELNET;
- Supporting DHCP;
- Supporting PPPoE;
- Supporting asynchronous file transfer protocol of X-MODEM;
- Supporting NAT;
- Supporting policy-based routing;
- Supporting VRRP;
- Supporting L2TP and PPTP;
- Supporting TFTP.

### Friendly User Interface

- The standard operation interface allows visual configuration, and each command is accompanied by detailed online help;
- The user manual contains detailed explanation and demonstration of each command, and provides comprehensive fault analysis;
- Both the WEB configuration interface and the standard CLI configuration interface are provided, reducing the costs of study and usage and bringing convenience to maintenance.

## Abundant Diagnosis and Management Tools

- Comprehensive debugging and tracking commands are provided, allowing convenient and precise location of various network faults.
- Complete statistics and status information display functions are provided, enabling user to have a clear knowledge of network performance and operating status.
- Supporting multiple terminal login and configuration modes, such as configuration via the console port, login and configuration via TELNET, and configuration via the TFTP server.

## Excellent Security

- Adopting the perfect firewall and IP packet filtering technology to implement rigid checking of network address, port number or protocol type.
- PAP and CHAP protocol over PPP protocol.
- Supporting MAC address binding.
- Supporting Network Address Translation (NAT).

## Professional Flow Control

- The gateway product adopts the new-generation DPI engine developed by Nodexon Networks, and is capable of precisely recognizing over 600 protocols including P2P, IM, stock application, stream media, officing and online gaming.
- Real-time acquisition, monitoring and precise analysis of network flow, achieving the visualization of network operation status, application status and bandwidth usage status. Protocol-based and user-based real-time flow analyzer provides detailed information on source/destination IP address, service port, application protocol, session number and flow size.
- Supporting user (source IP address), destination IP address, time, protocol and application based flexible blocking and permitting, including: outbound and inbound bandwidth control, session number control and so on.
- Supporting group object configuration, such as the configuration of user group (IP group) and protocol group (such as P2P protocol group and gaming group), as well as the bandwidth management policy based control of users of the same level and with the same type of application.

## URL Filtering and Auditing

- The independently developed Chinese URL database: The independently developed URL system will constantly collect URL information, and the URL database of Nodexon Networks is divided into 41 categories, with 6 million entries covering almost all websites in Mainland China.
- Supporting user (source IP address), URL classification and time based flexible blocking and permitting of URL accesses of intranet users.
- Supporting user (source IP address), URL classification and time based real-time auditing of URL accesses of intranet users and flexible query of audit content.

## Easy Upgrade

- Supporting asynchronous file transfer protocol of X-MODEM, allowing the user to download new versions of upgrade software through Console port under various operating systems (such as Windows 95, Windows NT, UNIX, and DOS).

- Downloading new versions of software via TFTP protocol.
- Online upgrade of BOOTROM.
- Supporting automatic upgrade and upgrade via Web.

### **High Reliability in Software and Hardware.**

- Supporting bridge mode, routing mode, bypass mode and other deployment modes, meeting the need for deployment in various contexts.
- The transparent bridging does not change the configurations of other devices, allowing complete URL filtering, flow control and content auditing.
- The bypass mode ensures that the network is free from single point failure and will not affect network performance.
- Built-in hardware BYPASS guarantees uninterrupted forwarding in case of power failure, device reboot and other abnormal circumstances.

## Preparations before Installation

### Safety Precautions

The breakout gateway acts as the critical transfer station of network connections, and its normal service is crucial to the normal operation of the entire network.

The following safety suggestions are applicable to the installation and use of the breakout gateway:

- Do not place the device in a watery place and prevent any liquid from entering into it.
- Keep the device away from heat sources.
- Ensure the normal grounding of device.
- Wear an anti-static wrist strap to install and maintain the device.
- Do not wear loose clothes to avoid hooking any parts. Before operation, tighten your band, shawl and sleeves.
- Keep tools and parts away from the walkway to avoid damage.
- Use the uninterruptible power supply (UPS) to avoid power failure and other interferences.

If the system time is incorrect, check whether you have set the clock. If the clock is not set, the time may not be correct; if the clock has been set precisely and the time is still incorrect, the built-in button cell of device may have ran out, which is typically happened after 10-year service.

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**Note** Install and use the device in restricted access locations.

Use of wrong battery may cause damage to the device. Do not replace the battery by yourself. Please contact the Customer Service Department of Nodexon Networks for help.



**Note** Invite professionals and related technicians to install this type of device.

This is a Class-A product which may cause radio interference in the living environment. In such a case, the user may need to take feasible measures against such interference.

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### Requirements on Installation Environment

Nodexon SG series breakout gateway products are for indoor use only. To ensure normal operation and prolong their service life, the installation site must meet the following requirements:

Temperature/humidity requirements

- Cleanliness requirements
- Anti-static requirements
- Anti-interference requirements
- Lightning protection requirements
- Checking the installation location

## Temperature/Humidity Requirements

To ensure normal operation and prolong the service life of the device, the equipment room must maintain constant temperature and humidity. If the equipment room is overheated for a long time, the insulation materials may result in defective insulation and even electric leakage. If the relative humidity is low, the insulation spacer may result in dry shrinkage, which will make screws looser and easily generate static electricity in the dry environment, thus damaging the interior circuits on the device. Excessively high temperature will accelerate the aging of insulation materials and compromise the reliability and even service life of the device. The temperature/humidity requirements are shown below (detailed difference between products is described in the chapter of "Product Overview"):

■ Table 2-1 Temperature and Humidity Requirements of Nodexon SG Series Breakout Gateways

Temperature		Relative Humidity	
Long-term working condition	Short-term working condition	Long-term working condition	Short-term working condition
15°C to 30°C/ 59°F to 86°F	0°C to 45°C/ 32°F to 113°F	40% to 65%	10% to 90%



**Note** The temperature/humidity of working atmosphere indicates the value measured at 1.5 m above the floor and 0.4 m ahead of the equipment frame when there is no protection plate on the front and rear side of the equipment frame.



**Note** Short-term working condition refers to the continuous operation no exceeding 48 hours or accumulative operations no exceeding 15 days in a year.



**Note** Extremely harsh working environment generally refers to the ambient temperature and humidity which may be encountered when the equipment room air-conditioning system fails but will recover in less than 5 hours every time.

## Cleanliness Requirements

The dust is also a major threat to the safe operation of device. The dust accumulated on the device may cause electrostatic adsorption and result in poor contact. It will not only compromise the service life of device but also cause communication failure. When the indoor relative humidity is low, such electrostatic adsorption will incur more easily.

■ Table 2-2 The Equipment Room Dust Content and Particle Size Requirements of Nodexon SG Series Breakout Gateways

<b>Maximum Diameter (µm)</b>	0.5	1	3	5
<b>Maximum Density (Particles/m<sup>3</sup>)</b>	1.4 x 10 <sup>7</sup>	7 x 10 <sup>5</sup>	2.4 x 10 <sup>5</sup>	1.3 x 10 <sup>5</sup>

Apart from the dust, the device is also sensitive to the hydrochloric acid sulfide contained in the air. These noxious gases will accelerate metal wastage and the aging of certain parts. The upper limits of noxious gases (Sulfur dioxide, Sulfured hydrogen, Nitrogen dioxide, Ammonia and Chlorine) in the equipment room are shown in Table 2-3:

■ Table 2-3 Upper Limits of Noxious Gases of Nodexon SG Series Breakout Gateways

Gas	Average (mg/m3)	Maximum (mg/m3)
Sulfur dioxide	0.2	1.5
Sulfured hydrogen	0.006	0.03
Nitrogen dioxide	0.04	0.15
Ammonia	0.05	0.15
Chlorine	0.01	0.3

## Anti-Static Requirements

The breakout gateway has already given consideration to electrostatic prevention during circuit design, but excessively strong static electricity will still damage the circuit board. The static electricity in the communication network connected with the device is mainly from:

- Outdoor high-voltage transmission line, lightning and other exterior electric fields.
- Indoor environment, flooring material, complete appliance structure and other in-house systems.

To avoid the damage caused by static electricity, we shall:

- Properly ground the device and floor;
- Apply indoor dust control;
- Maintain proper temperature and humidity;

Pay attention to the following for modules or circuit boards which can be disassembled by the user:

- Before touching the circuit board, wear an anti-static wrist strap and an anti-static uniform;
- Place the circuit board disassembled face up on the antistatic workbench or in the electromagnetic shielded bag.
- When observing or transferring the circuit board of breakout gateway, touch the outer edge of circuit board and avoid direct contact with the components on the circuit board.

## Anti-Interference Requirements

The interference as mentioned herein refers to electromagnetic or electrical interference, and the anti-interference requirements are described below:

- Effective power grid interference control measures shall be taken against the power supply system.
- The working ground of the breakout gateway shall be kept far away from the grounding device or lightning grounding device of power equipment instead of sharing.
- The gateway shall be kept far away from high-power radio-transmitting station, radar-transmitting station and other high-frequency & heavy-current devices.
- Electromagnetic shielding measures shall be taken whenever necessary.

## Checking the Installation Location

No matter the breakout gateway is installed in the cabinet or on the workbench, the following requirements shall be met:

- Make sure sufficient room has been reserved for the air intake and air vent of breakout gateway to facilitate the heat elimination of the gateway chassis. It is recommended to install the breakout gateway in the 19-inch standard cabinet. Otherwise, install it on a clean and flat surface. In heated areas, the air conditioning system shall be equipped.

- Make sure the cabinet and workbench is equipped with a good ventilation and cooling system.
- Make sure the cabinet and workbench is steady enough and capable of withstanding the weight of the breakout gateway and its accessories.
- Make sure the cabinet and workbench is properly grounded.

## Installation Tools and Devices

To enable smooth installation, prepare the following items:

- Installation tools
- Connecting cables
- Related devices

Installation tools include:

- Phillips screwdriver
- Anti-static wrist strap

Connection cables include:

- Power cables
- Configuration cables
- Ethernet cables
- Grounding wires

Related devices include:

- HUB or switch
- Configuration terminal (PC with hyper-terminal)
- Electric outlet

# Installing the Breakout Gateway

## Mounting the Breakout Gateway

Mounting the breakout gateway refers to installing the device to the specified position. Upon completion of installation preparation, fix the breakout gateway to the specified position. The installation position of breakout gateway is generally a cabinet or a workbench.

### Mounting into a Cabinet

Nodexon breakout gateway products are designed based on the dimension of a standard cabinet. You can install the device with the enclosed fixing accessories.

### Mounting on a Workbench

In most cases, the user does not have a standard cabinet. Instead, the user can place the device on a clean workbench. Although it is easy and simple, you shall pay attention to the following:

Guarantee the steadiness and good grounding of the workbench;

- Stick the attached plastic pads onto the small holes at the bottom of the breakout gateway, and reserve a heat elimination room of 10 cm around the device.
- Do not place heavy things on the device.

## Installing Power Cables

The requirements of Nodexon SG series breakout gateway products on AC power supply are described below (refer to the section of "Product Overview" for detailed parameters):

100–240 V / 50–60 Hz

Make sure your power supply meets the requirement.

Breakout gateway uses 3-conductor power cables. You are suggested to use a single-phase 3-conductor outlet or a multifunction microcomputer outlet with neutral connector. The neutral point of the power supply shall be securely grounded in the building. In most buildings, the neutral point of a power supply has been grounded during the construction. You need to make sure the power supply is properly grounded.

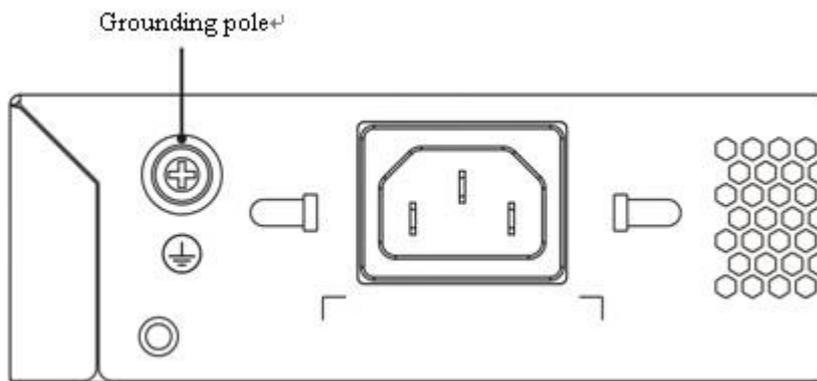
Install power cables as per the following steps:

- 1) Plug one end of the power cable into the power socket on the backpanel of a breakout gateway, and plug the other end into the AC power supply outlet.
- 2) Check whether the power LED on the front panel of the breakout gateway lights up or not. The LED indicator will light up if the power supply is properly connected.

## EMC Grounding

The grounding required for EMC design includes shielding ground, filter ground, noise and interference suppression, and level reference. All the above constitute the comprehensive grounding requirements. The grounding resistance should be less than 1 ohm. The SG series devices are equipped with a grounding pole at the rear panel, as shown in Figure 3-2.

Figure 3-2 Schematic Diagram of Grounding of the SG Series Devices



## Connecting Console

Nodexon SG series breakout gateway provides an EIA/TIA-232 asynchronous serial console port, through which the user can complete the local configuration of the breakout gateway. The attributes of a console are shown in Table 3-1. In case of WEB based configuration, the console port will be of no use.

■ Table 3-1 Attributes of the Console Connection:

Parameter	Description
Connector	RJ-45
Interface Standard	Asynchronous EIA/TIA-232
Baud Rate	Supporting 9600 bps (default), 57600 bps and 115200 bps
Services Supported	1. Command line interface 2. Connection with character terminal 3. Provision of terminal access service as an asynchronous interface

You can configure the console port of a breakout gateway based on the following steps:

Connect one end of the enclosed configuration cable to the console port of device and the other end to the DB-9 male interface of the microcomputer used for configuring the device.

## Checking after the Installation

After completing the mechanical installation of breakout gateway, perform the following checks before powering on the device:

- If the device is installed in a cabinet, check whether the angle bar for device installation is steady. If the device is installed on the workbench, check whether sufficient room is reserved around the device to ensure heat elimination and whether the workbench is steady.
- Check whether the power supply meets the requirements.
- Check whether the earth wire of device is properly connected.
- Check whether the device is connected correctly to other devices like the configuration terminal.

## Starting and Configuring the Breakout Gateway

### Starting a Breakout Gateway

#### Powering on the Breakout Gateway

##### Checks before Power-on

Before power-on, perform the following checks on the breakout gateway:

- Whether the power cable and the ground wire are properly connected;
- Whether the power voltage is consistent with the requirement of the breakout gateway.
- Whether the configuration cable is properly connected, and whether the microcomputer or terminal for gateway configuration is started or configured.



Before powering on the breakout gateway, be aware of the location of the power switch of the breakout gateway to timely cut off power supply in case of any accident.

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#### Powering on the Breakout Gateway

- Turn on the power supply switch of the breakout gateway
- Turn on the power switch of the breakout gateway and set the power switch to "ON" position.

##### Checks after Power-on

After the breakout gateway is powered on, check the following items:

- Whether the ventilation system works normally  
Checking procedure: After power-on, you can hear the fan working; put your hand nearby the vent hole of breakout gateway to feel the airflow.
- Whether the LED indicators on the front panel of the breakout gateway works normally.  
Checking procedure: Refer to the section of indicators description about each product in the first chapter "Product Overview".
- Whether the configuration terminal displays normally  
Checking procedure: After the breakout gateway is powered on, the terminal will display the software self-extracting information of the breakout gateway.

# Troubleshooting

## Power Supply Troubleshooting

Nodexon SG3750 breakout gateway provides a PWR LED on the front panel for indicating whether the power system works normally. Refer to “Product Overview” for the normal state descriptions of LED indicators. If abnormality occurs, perform the following checks:

- Whether the power switch is turned on;
- Whether the power supply of the breakout gateway is turned on;
- Whether the power cable is properly connected;
- Whether the power supply to the breakout gateway meets relevant requirements.

**Caution**

Do not plug or pull the power cable when the power switch is already turned on. If everything is ok but the PWR LED still does not light up, contact with a local dealer or technical support personnel.

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