



Avaya one-X™ Quick Edition

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G10 PSTN Gateway Installation Guide

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About this Guide

Overview

This guide explains how to install an Avaya one-X Quick Edition G10 PSTN gateway and provides technical specifications about G10 PSTN gateways. The *Avaya one-X Quick Edition System Administrator Guide* explains how to configure G10 PSTN gateways.

For additional information about the organization of this guide, see [Document Organization on page 6](#).

Intended Audience

This guide is for people who are responsible for connecting G10 PSTN gateways to the one-X Quick Edition network. While some of the concepts introduced in this guide are technical in nature, the information in this guide is written in a simple way to ensure that anyone can install a G10 PSTN gateway.

Issue Date

This document was issued for the first time in March 2006. Issue 2 of the guide was released in March 2006 with changes and additions.

How to Use This Document

This guide is organized to help you find topics in a logical manner. Read it from start to finish to get a complete understanding of G10 PSTN gateway features and the installation process. You may optionally use the Table of Contents or Index to locate information specific to a task or function.

Document Organization

This guide contains the following chapters:

Chapter	Description
Chapter 1: Overview	Provides an overview of a typical one-X Quick Edition network configuration and describes the hardware characteristics of the G10 PSTN gateway.
Chapter 2: Installation and Maintenance	Explains how to install and reset a G10 PSTN gateway, and how to determine the extension number and/or IP address of a G10 PSTN gateway.

Symbolic Conventions

Note:

This text precedes additional information about a topic.



Tip:

This symbol highlights the benefits and capabilities of the product or makes you aware of alternative methods that can help you increase efficiency.



CAUTION:

This symbol calls attention to situations that can result in harm to software, loss of data, or an interruption to service.

Typographic Conventions

Convention	Description
<u>Document</u>	Underlined text indicates a section or subsection in this document containing additional information about a topic.
"Section"	Text enclosed in double-quotation marks indicates a reference to a specific chapter or section of another document.
<i>Italics</i>	Italic type indicates the title of another document.
System Options	Words shown in bold represent literal elements of the user interfaces.

one-X Quick Edition Documentation

The most up-to-date Avaya one-X Quick Edition product documentation and additional documentation is available by searching for "Quick Edition" online at the following URL:

<http://avaya.com/support>

For safety information and a quick reference to installing a G10 PSTN gateway, see the *Avaya one-X Quick Edition G10 PSTN Gateway Quick Installation Guide* (Document Number 16-600796).

For complete information about installing a G10 PSTN gateway, refer to this guide, the *Avaya one-X Quick Edition G10 PSTN Gateway Installation Guide* (Document Number 16-600793).

For safety information, a quick reference to installing Avaya 4610SW/4621SW IP telephones, and telephone stand/wall-mounting instructions, see the *Avaya one-X Quick Edition Telephone Quick Installation Guide* (Document Number 16-600797).

For detailed information about how to install and use an Avaya 4610SW/4621SW IP telephone, see the *Avaya one-X Quick Edition Telephone User Guide* (Document Number 16-600795).

For information about how to access and modify system-wide options including setting the system date and time, configuring paging zones, administering user groups, and using the web-based administration interface, see the *Avaya one-X Quick Edition System Administrator Guide* (Document Number 16-600794). The *Avaya one-X Quick Edition System Administrator Guide* also contains detailed troubleshooting procedures and procedures for configuring G10 PSTN gateways.

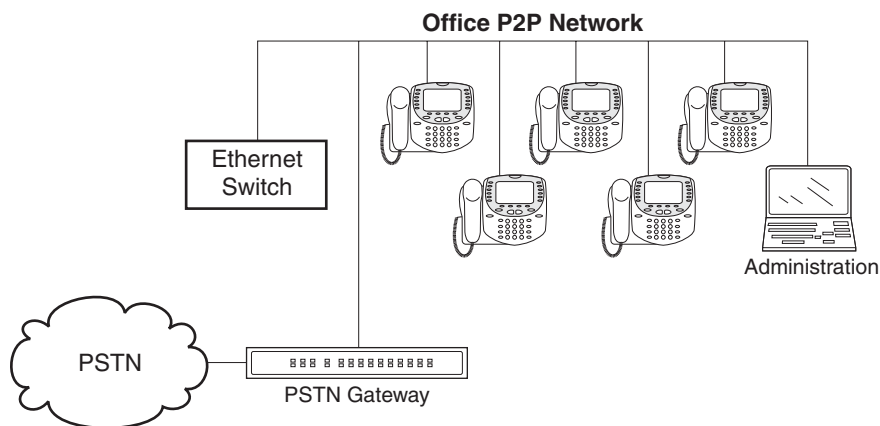
Chapter 1: Overview

Introduction

A G10 PSTN gateway has four Foreign Exchange Office (FXO) ports that provide your one-X Quick Edition network with access to the Public Switched Telephone Network (PSTN) through PSTN lines managed by your telephone service provider.

[Figure 1](#) shows the position of a G10 PSTN gateway in a typical company telephone network. Up to ten G10 PSTN gateways can be connected to your one-X Quick Edition network if required to increase the number of PSTN connections into your office.

Figure 1: Typical one-X Quick Edition Network Configuration



A typical configuration consists of a customer-supplied 10/100 Base-T Ethernet Local Area Network (LAN) with a connected IP router or switch, to which the G10 PSTN gateway and your telephones are connected. An administration computer may be connected to the network to provide web-based access to G10 PSTN gateway configuration settings.

If your 4610SW/4621SW IP telephones are already connected to the LAN, adding a G10 PSTN gateway to the system is easy. Simply connect the G10 PSTN gateway LAN port to an unused port on the IP router or switch, and connect the G10 PSTN gateway FXO ports to the PSTN lines supplied by your service provider. When the IP router or switch is IETF 802.3af Power over Ethernet (PoE) enabled, power is delivered to the G10 PSTN gateway through the router or switch, and the G10 PSTN gateway configures itself automatically.

Note:

If your LAN is not PoE enabled, you can use the supplied 12 VDC/1A power adapter to supply power to the G10 PSTN gateway.

Hardware Features

This section describes the hardware features of the G10 PSTN gateway. See [Figure 3](#) for a diagram of the G10 PSTN gateway rear panel.

Ground Lug

A ground lug is provided to ground the G10 PSTN gateway if necessary. If you hear an audible hum or noise during calls to and from the PSTN, connect the G10 PSTN gateway to ground earth via the ground lug on the rear panel. A ground wire (also known as a "hook up wire") is not provided in the shipment for this purpose. You are responsible for obtaining the required ground wire and for connecting the G10 PSTN gateway to earth ground according to local electrical codes and standards.

A suitable ground wire would be a 24 AWG (0.0201 in. or 0.511 mm) solid copper wire, or a lower gauge (23, 22, 21 AWG and so on) solid copper wire.

An earth ground connection can be made in one of several ways—follow local electrical codes to ground the G10 PSTN gateway.

12V-1.0A Adaptor Jack

The G10 PSTN gateway can operate from an 802.3af PoE LAN, or from the supplied 12 VDC / 1A wall adapter (see [Figure 2](#)). The adapter connects the G10 PSTN gateway to a power source.

If you use the supplied adapter, plug it into the 12V-1.0A adaptor jack and power on the G10 PSTN gateway last—after you make all other necessary connections.

LAN Port

The G10 PSTN gateway has one 10/100 Base-T Ethernet connector: an RJ45 LAN port. Using a customer-supplied Cat5 (or better) Ethernet cable, you connect the LAN port to an unused port on an IP router or switch that is connected to your Ethernet LAN.

The LAN port has two LEDs: a green link-and-activity LED (right of the port) and an amber speed LED (left of the port). The link-and-activity LED indicates a link when solid green, and activity when flashing green. The speed LED indicates 10 Base-T when off, and 100 Base-T when solid yellow.

Reset Button

It is a good practice to reset the G10 PSTN gateway to factory settings if you want to remove the G10 PSTN gateway from the network for an extended period of time.

To reset the G10 PSTN gateway to factory settings, see [Resetting a G10 PSTN Gateway to Factory Settings on page 19](#).

External Paging Jack

If required, the G10 PSTN gateway has an External Paging 3.5 mm mini-jack that you can connect to a customer-supplied audio amplifier with speaker for making announcements. The output is monophonic (single-channel).

The External Paging jack provides a maximum output of 1 Vrms across an impedance of 47.0 kohms. The output impedance is 600 ohms.

Music on Hold Jack

The G10 PSTN gateway has a Music on Hold audio input mini-jack to support the one-X Quick Edition system's music-on-hold feature. The jack accommodates standard 3.5 mm connectors. Ensure that the volume at the audio source is set to a comfortable level—at the audio source, adjust the volume to produce an audible level at the handset.

The Music on Hold jack supports a maximum input level of 2 Vrms across an input impedance of 47.0 kohms.

FXO Ports (L4, L3, L2, L1)

The four FXO ports (L4, L3, L2, L1) on the G10 PSTN gateway are designed to receive analog telecommunications lines from a Central Office (CO) of the PSTN. These lines, also known as trunks, are called PSTN lines. Your service provider delivers one or more PSTN lines to your place of business through telephone jacks on the wall, or a patch panel in a telephone closet.

You can connect the G10 PSTN gateway to a telephone jack using standard 4-wire modular line cords (telephone cords) equipped with RJ11 connectors. Plug one end of the telephone cord into the telephone jack, and plug the other end of the telephone cord into port L1 of the G10 PSTN gateway.

The G10 PSTN gateway works with loop-start PSTN lines. The term "loop start" describes the way the system applies analog signaling to obtain a dial tone. When you arrange to lease services from your local telephone company, order loop-start lines.

Each PSTN line from your service provider supports a single conversation at a time. To allow more than one user on the one-X Quick Edition network to place or receive calls to or from the PSTN simultaneously, you will need to order more than one PSTN line from your service provider. You can connect a maximum of four PSTN lines to a single G10 PSTN gateway.

If you need more than one PSTN line, consider asking your service provider to assign a hunt group to the PSTN lines. When the lines are assigned to the same hunt group, outside callers can dial a single PSTN number (a ten-digit telephone number) to reach your place of business—the incoming call is forwarded to the first available PSTN line. If the PSTN lines are not assigned to a hunt group, your service provider will assign a unique ten-digit telephone number to each PSTN line.

Up to four PSTN lines may be connected to the FXO ports (L4, L3, L2, L1) on the rear panel of the G10 PSTN gateway. To connect PSTN lines to the G10 PSTN gateway, obtain as many telephone cords as you need, and ensure that they are long enough to reach from the G10 PSTN gateway to the supplied telephone jacks.

A PSTN line must always be connected to port L1 using a telephone cord to support the analog telephone bypass feature (see [Analog Telephone Bypass Port on page 12](#)). You may connect additional PSTN lines to ports L2, L3, and L4 using customer-supplied telephone cords.

Analog Telephone Bypass Port

You will need a Plain Old Telephone Service (POTS) analog telephone to connect to the analog telephone bypass port on the G10 PSTN gateway. The analog telephone bypass port is a type of power fail-transfer port.

To maintain an emergency connection to the PSTN at all times, plug the analog telephone into the analog telephone bypass port on the G10 PSTN gateway (see [Figure 3](#)) and keep a PSTN line (via a modular line cord) connected to port L1 on the rear panel of the G10 PSTN gateway. In the event of a power failure, the analog telephone can then be used to place and receive calls to and from the PSTN.

Normally (when the G10 PSTN gateway has power), the bypass port is disabled—there is no connection to the PSTN, so a dial tone cannot be heard through the analog telephone handset.

When no power is being delivered to the G10 PSTN gateway, an internal connection between the L1 port and the bypass port is closed automatically, which causes a connection to the PSTN through the bypass port. When the bypass port has a connection to the PSTN, you can hear a dial tone through the analog telephone handset, and you can place and receive calls using the analog telephone.

Front Panel LEDs

There are five LEDs on the front panel of the G10 PSTN gateway. The left-most LED is the Power LED. It turns red when the G10 PSTN gateway is powered on, and changes to green when the G10 PSTN gateway is ready to service calls to and from the PSTN.

The L1, L2, L3, and L4 line LEDs reflect the status of PSTN lines:

- When a line LED is off, no PSTN line is connected.
- When a line LED is green, the connected PSTN line is available but not in use.
- When a line LED flashes green, the connected PSTN line is in use.

Technical Specifications

[Table 1](#) provides a summary of the technical specifications associated with G10 PSTN gateways.

Table 1: Technical Specifications

FXO Ports	Four analog ports configured for loop-start operation; RJ11 connectors
Power Fail-transfer Port	One analog telephone bypass port; RJ11 connector
Network Port	10/100 Base-T; RJ45 connector
Audio Input	Supports a maximum input level of $2 V_{\text{rms}}$ across an input impedance of 47.0 kohms; standard 3.5 mm mini-jack connector
Paging Output	Provides a maximum output of $1 V_{\text{rms}}$ across an impedance of 47.0 kohms; Output impedance is 600 ohms; standard 3.5 mm stereo mini-jack connector
CODEC Options	G.711 PCM default for live conversation; G.729a (Annex B) can be negotiated if required to support calls initiated at the far end. G.729a (Annex B) is used for voicemail storage.
Power Options	IETF 802.3af Power over Ethernet 12 VDC/1A power adapter (optional)
Certifications	UL/cUL UL60950-1: 2003, First Edition CSA C22.2 No. 60950-1-03 1st Ed. April 1, 2003 FCC Part 15, Subpart B Class B, and FCC Part 68 ANSI C63.4:2003

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Table 1: Technical Specifications (continued)

Operating Temperature/ Humidity	32° F to 104° F (0° C to 40° C) 10% to 95% non condensing
Storage Temperature/ Humidity	14° F to 104° F (-10° C to 40° C) 5% to 90% non condensing
MAC Address	See the label affixed to the bottom of the device.
2 of 2	

Chapter 2: Installation and Maintenance

Unpacking the Shipment

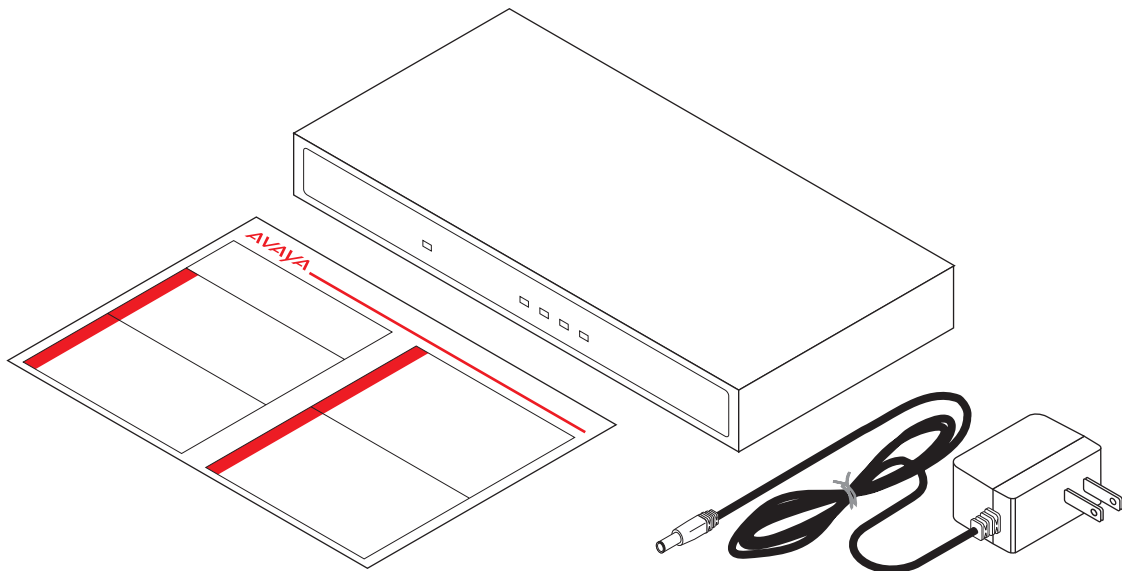
The shipment contains the following equipment (see [Figure 2](#)):

- One Avaya one-X Quick Edition G10 PSTN Gateway Quick Installation Guide,
- One Avaya one-X Quick Edition G10 PSTN gateway, and
- One 12 VDC/1A power adapter.

You must supply the following equipment:

- An analog (POTS) telephone,
- An RJ45 Category 5 (Cat5) Ethernet cable (or better) to connect the G10 PSTN gateway to the LAN, and
- Up to four lengths of standard 4-wire modular line cord (telephone cord) equipped with RJ11 connectors to connect the G10 PSTN gateway to the PSTN lines (telephone jacks) supplied by your service provider.

Figure 2: Supplied G10 PSTN Gateway Equipment



Installing a G10 PSTN Gateway

CAUTION:

If you have any 4610SW/4621SW IP telephones to install, install them first.

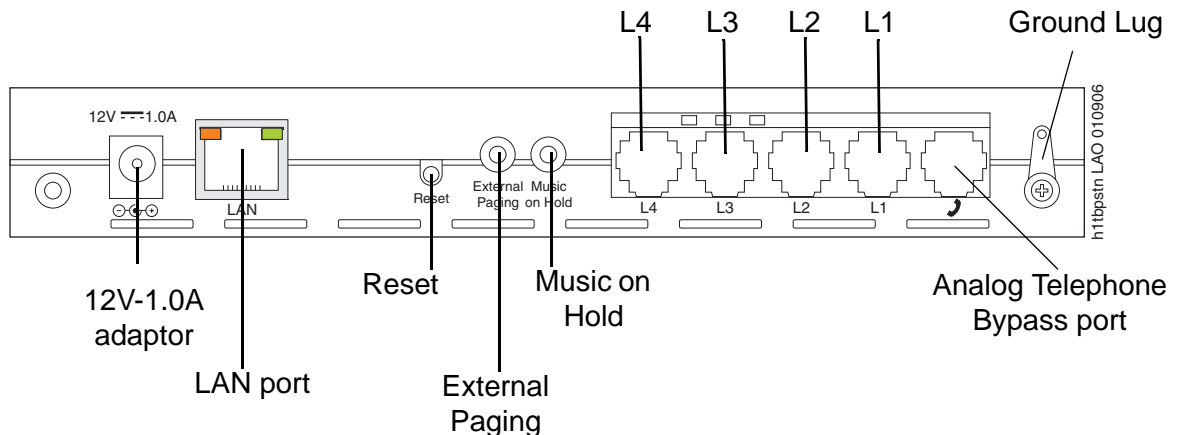
The procedures in this section refer to the ports and jacks on the rear panel of the G10 PSTN gateway (see [Figure 3](#) below). Two procedures are provided:

- To connect a G10 PSTN gateway to a 802.3af PoE LAN, see [To connect a G10 PSTN gateway to a 802.3af PoE LAN on page 17](#).
- To connect a G10 PSTN gateway to a LAN that is not 802.3af PoE enabled, see [To connect a G10 PSTN gateway to a LAN that is not 802.3af PoE enabled on page 17](#).

Note:

In addition, the installation procedures reference a customer-supplied analog phone, a customer-supplied Cat5 Ethernet cable, and customer-supplied telephone cords.

Figure 3: G10 PSTN Gateway Rear Panel



Tip:

If you have trouble with a G10 PSTN gateway after you install it, refer to the “Troubleshooting” chapter of the *Avaya one-X Quick Edition System Administrator Guide* to resolve the problem.

To connect a G10 PSTN gateway to a 802.3af PoE LAN

1. Place the G10 PSTN gateway on a flat surface in a well-ventilated space with access to your Ethernet connection.
2. Plug one end of the Cat5 Ethernet cable into the LAN port on the G10 PSTN gateway.
3. Connect the other end of the Cat5 Ethernet cable to the Ethernet LAN used by your 4610SW/4621SW IP telephones.
Initially, the Power LED on the front panel will be red. In two to three minutes, the Power LED will turn solid green to signal that the G10 PSTN gateway is ready.
4. Plug one end of a telephone cord into the telephone jack supplied by your service provider.
5. Plug the other end of the telephone cord into port L1 on the G10 PSTN gateway.
The line LED associated with the connected PSTN line turns green.
6. If you ordered additional PSTN lines, connect them to ports L2, L3, and/or L4 on the G10 PSTN gateway using telephone cords as described above in Steps [4](#) and [5](#).
The line LEDs associated with connected PSTN lines turn green.
7. Plug your analog telephone into the analog telephone bypass jack on the G10 PSTN gateway.

Note:

You will not hear a dial tone on this telephone unless the source of power to the G10 PSTN gateway is interrupted.

To connect a G10 PSTN gateway to a LAN that is not 802.3af PoE enabled

1. Place the G10 PSTN gateway on a flat surface in a well-ventilated space with access to your Ethernet connection.
2. Plug one end of the Cat5 Ethernet cable into the LAN port on the G10 PSTN gateway.
3. Connect the other end of the Cat5 Ethernet cable to the Ethernet LAN used by your 4610SW/4621SW IP telephones.
4. Plug the supplied 12 VDC/1A power adaptor into the 12V-1.0A jack on the G10 PSTN gateway.
5. Plug the other end of the adapter cable into the power source.
Initially, the Power LED on the front panel will be red. In two to three minutes, the Power LED will turn solid green to signal that the G10 PSTN gateway is ready.
6. Plug one end of a telephone cord into the telephone jack supplied by your service provider.
7. Plug the other end of the telephone cord into port L1 on the G10 PSTN gateway.
The line LED associated with the connected PSTN line turns green.

8. If you ordered additional PSTN lines, connect them to ports L2, L3, and/or L4 on the G10 PSTN gateway using telephone cords as described above in Steps [6](#) and [7](#).
The line LEDs associated with connected PSTN lines turn green.
9. Plug your analog telephone into the analog telephone bypass jack on the G10 PSTN gateway.

Note:

You will not hear a dial tone on this telephone unless the source of power to the G10 PSTN gateway is interrupted.

Configuring a G10 PSTN Gateway

When a computer is connected to the same network as your G10 PSTN gateway, you can access, manage, and upgrade system-wide features through the web-based administration interface. For best results, choose Microsoft Internet Explorer 6.0 (or later) or Mozilla Firefox 1.0 (or later).

Note:

Refer to the *Avaya one-X Quick Edition System Administrator Guide* to configure a G10 PSTN gateway. For example, refer to the *Avaya one-X Quick Edition System Administrator Guide* to adjust the loop length setting for each connected PSTN line, and to configure optional G10 PSTN gateway settings if required.

Any 4610SW/4621SW IP telephone or G10 PSTN gateway can be configured or upgraded through the web-based administration interface, provided that the administration computer has local or remote access to the associated one-X Quick Edition network through a web browser. Logging in to any of the 4610SW/4621SW IP telephones through the web browser enables provisioning of the entire one-X Quick Edition system. All system changes and updates are automatically communicated to all 4610SW/4621SW IP telephones and G10 PSTN gateways making up the network.

Regardless of whether the administration computer is connected locally or remotely, a secure connection is provided between the administration computer and the 4610SW/4621SW IP telephone through Secure Sockets Layer (SSL) encryption. Password authentication ensures that only authorized users can access system-wide configuration settings. For more information about how to access and use the web-based administration interface, see the "Web-based Administration" chapter of the *Avaya one-X Quick Edition System Administrator Guide*.

Note:



The G10 PSTN gateway is a field-replaceable unit. There are no user-serviceable parts.

Obtaining the Extension Number and/or IP Address of a G10 PSTN Gateway

Every G10 PSTN gateway has an extension number; however, the number is not displayed in the one-X Quick Edition Corporate directory and cannot be called.

If your network has more than one G10 PSTN gateway and you are not sure which extension number has been assigned to a particular G10 PSTN gateway, here is a way to determine both the extension number and IP address of the G10 PSTN gateway.

To learn the extension number and IP address of a G10 PSTN gateway

1. Go to the G10 PSTN gateway and record its MAC address (see the label on the bottom of the G10 PSTN gateway).
2. Using any 4610SW/4621SW IP telephone connected to the network, press the **Options** () button below and to the right of the display area.
3. Select **Options** on the **Main** menu, or press 1 on the dialpad.
4. Select **System Options** on the **Options** menu, or press 2 on the dialpad.
5. When you are prompted to enter a password, press the keys on the dialpad to enter the administration password.
6. Select the **Done** softkey.
7. Select **Gateways** on the **System Options** menu, or press 5 on the dialpad.
8. One at a time, select the Line/Feature () button beside each gateway entry, and then select **Details** to view the associated MAC addresses. When you locate the gateway that matches the MAC address, note its extension number and if required, its IP address.

Resetting a G10 PSTN Gateway to Factory Settings

There are two reasons for resetting a G10 PSTN gateway to factory settings. Reset the G10 PSTN gateway when:

- the device is operational but you want to remove the G10 PSTN gateway from the system, or
- you want to move the G10 PSTN gateway to a different one-X Quick Edition network.

You can reset and power cycle a G10 PSTN gateway as follows. These steps reset the G10 PSTN gateway to factory settings. The procedures assume that no telephone cords (PSTN lines) are connected to the FXO ports on the rear panel of the G10 PSTN gateway.

To reset a G10 PSTN gateway to factory settings:

Note:

Before you begin, verify that the Power LED on the G10 PSTN gateway is green. If the Power LED is red, see [To reset a G10 PSTN gateway when the Power LED is red](#) on page 20 instead.

1. Press and hold the Reset button on the rear panel of the G10 PSTN gateway.
2. When the Power LED turns red and line LED L1 on the front panel turns green, release the Reset button.

The line LEDs turn green one at a time in sequence, as each stage of the reset process completes.
3. Wait until line LEDs L3 and L4 both turn solid green at the same time, and then disconnect the supply of power to the G10 PSTN gateway.
4. Perform one of the following actions:
 - If the G10 PSTN gateway is operational but you want to remove the G10 PSTN gateway from the system, unplug the G10 PSTN gateway from the LAN.
 - If you want to move the G10 PSTN gateway to a different one-X Quick Edition network, see [Installing a G10 PSTN Gateway on page 16](#).

To reset a G10 PSTN gateway when the Power LED is red

1. Disconnect the supply of power to the G10 PSTN gateway, and then reconnect the supply of power.
2. Press and hold the Reset button on the rear panel of the G10 PSTN gateway until LED L1 on the front panel turns green, and then release the Reset button.

The line LEDs turn green one at a time in sequence, as each stage of the reset process completes.
3. Wait until line LEDs L3 and L4 both turn solid green at the same time, and then disconnect the supply of power to the G10 PSTN gateway.
4. Perform one of the following actions:
 - If the G10 PSTN gateway is operational but you want to remove the G10 PSTN gateway from the system, unplug the G10 PSTN gateway from the LAN.
 - If you want to move the G10 PSTN gateway to a different one-X Quick Edition network, see [Installing a G10 PSTN Gateway on page 16](#).

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