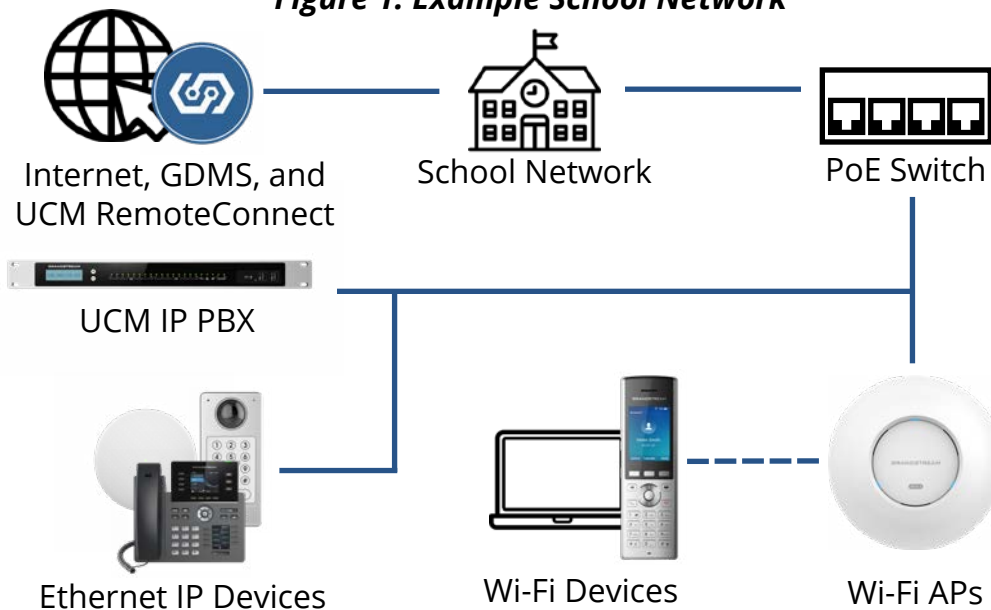# Grandstream K-12
School Deployment Guide

GRANDSTREAM

For K-12 schools, unified communications deployments typically require a diverse set of devices and features that can support the many roles and spaces within the facility. Being one of the most critical pieces of a school's infrastructure, it is essential that an installer, integrator, or IT manager understands the tools that are available to customize these networks. Grandstream's portfolio comes equipped with a diverse set of devices and features that integrate together in unique ways to help parents, staff, and students stay productive, informed, and safe.

This deployment guide provides guidance on deploying unified communications, security, and networking solutions for a school by utilizing Grandstream products. It will cover core device groups and their features that cater to K-12 school deployments, along with recommendations on configuring the deployment. Throughout the guide, you can refer to the below image as an example of a typical school deployment [Fig 1].

Figure 1: Example School Network

Internet, GDMS, and UCM RemoteConnect

UCM IP PBX

Ethernet IP Devices

School Network

Wi-Fi Devices

PoE Switch

Wi-Fi APs

Core of the Deployment - UCM IP PBX
The core of the school's unified communications solution is an on-premise UCM IP PBX. The IP PBX guides the communication and network data around the facility to ensure it arrives at the right location.

Extension Assignment
One of the most important features of a UCM IP PBX is the ability to assign extensions to devices and manage their inbound and outbound routes. This allows desktop IP phones, conferencing devices, paging and intercom endpoints, and even facility access devices to communicate with each other throughout the school and place calls outside of the facility. Extensions categorize devices and provide a reference point for them within the network. Extensions are used to define how IP endpoints call through outbound trunk routes and how inbound calls are routed to them. All Grandstream endpoints can be given an extension and, as a result, integrate together.
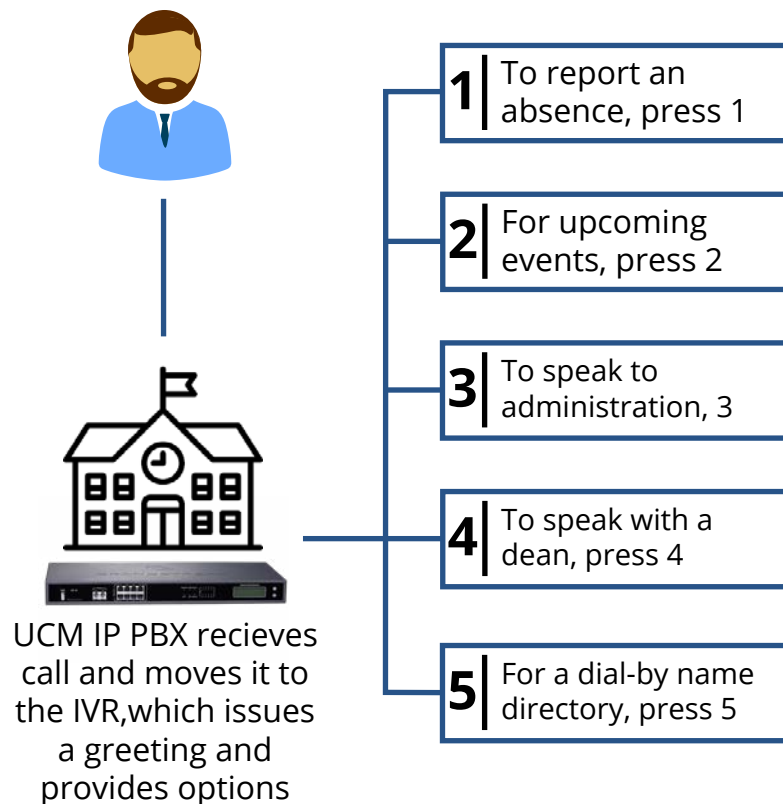
Outbound and Inbound Routes
Outbound routes pair an extension or set of extensions with a specific dialing pattern and SIP/analog trunk. This is how an installer may set a phone's permission level in a school network, and how outbound calls are routed through its trunks. Inbound routes define both the network trunks that accept incoming calls, based on their call patterns and how those calls are moved through the school's network. A key function of the inbound routing feature is setting a default destination for inbound calls through the specified trunk. For example, this enables schools to prioritize incoming call traffic from parents while effectively limiting how hands-on staff needs to be with routing more generic calls.

IVRs, Call Queues, and Call Management
The UCM IP PBX also supports various features that are essential to a school's communication networks. Interactive Voice Response (IVR) allows callers to route themselves to various extensions, call queues, and departments, without the need for a receptionist. Call queues can be enabled to help improve the flow of traffic to administration staff while not overwhelming them. Call management tools, such as Direct Inward Dialing numbers (DIDs), can provide direct lines for important departments and essential administration staff, such as a line for parents to call to report absences. [Fig 2].

Figure 2: IVR Exmple

1 | To report an absence, press 1

2 | For upcoming events, press 2

3 | To speak to administration, 3

4 | To speak with a dean, press 4

5 | For a dial-by name directory, press 5

UCM IP PBX recieves call and moves it to the IVR,which issues a greeting and provides options

UCM RemoteConnect
The UCM6300 Series and UCM6300 Audio Series are Grandstream's latest generation of IP PBXs. These devices come with a variety of new features, such as compatibility with UCM RemoteConnect. Ran through Grandstream Device Management System, this cloud service provides 99.9% reliability by running on Amazon Web Services (AWS) while offering zero-touch configuration and IT-friendly management. UCM RemoteConnect brings too major advantages to UCM6300 IP PBX deployments:

- Remote management of the UCM6300 IP PBX, complete with advanced diagnostic and reporting tools
- Automated NAT firewall traversal to easily allow remote workers to connect their IP endpoints to the LAN of the UCM IP PBX

For schools, UCM RemoteConnect can help streamline the management of a UCM IP PBX, while easily connecting devices that are outside of the primary LAN of the education facility. Installers or district IT teams can register, manage, and troubleshoot IP PBXs that are deployed across several institutions, all from one central location. Without the need to travel to each school in order to configure its IP PBX, IT teams can spend more time supporting and managing a school district's network infrastructure.

For IP endpoints that are deployed outside of the school, UCM RemoteConnect's NAT firewall traversal feature provides a simple and easy way to connect the devices to the UCM. Home offices, auxiliary school district facilities, and stadiums are some examples where a few IP endpoints can use this feature to connect to a UCM6300 series. This helps streamline and simplify a school district's communications deployment, while also ensuring that all facilities have proper access to IP endpoints and are connected to the central network.

Grandstream Wave

Ideal for teachers and administrative staff, Wave offers an easy-to-use platform to remotely join, schedule, and hold meetings, calls, and conferences from anywhere. It connects to the UCM6300 series allowing users to directly call other extensions, landlines, and mobile numbers. By integrating with a UCM6300 series, the entire network of users is automatically added into Wave's directory. Wave is free, available for Android and iOS devices, Chrome and Firefox browsers, and as downloadable software.

The application also offers chat and collaboration features, such as sending messages, creating group threads, and sharing files via private chat or group chats. It is compatible with Grandstream's UCM RemoteConnect cloud service, which ensures a fully secure connection between Wave and the UCM6300 series by providing automatic, always-on NAT firewall traversal. A school can provide its staff with a powerful mobile, web, and desktop tool to meet, call, and collaborate from anywhere, keeping everyone organized and working together.

Desktop and Mobile Endpoints – IP Phones

Our wide range of IP phones and video phones enables a school's communication network to be completely customized based on the needs of the users. Administration staff who are frequently on the phone and fielding higher call volumes can perform their tasks more efficiently with the right device. Meanwhile, teachers who need access to basic communication tools in their classrooms can be equipped with a cost-effective and intuitive device. Lastly, custodial and security staff can move throughout the facility while still being connected by utilizing our mobile cordless IP phones.

Configuration and Management

There are various options to choose from when configuring, provisioning, and managing Grandstream endpoints. Configuration to the network and extension assignment is done through the UCM IP PBX. Provisioning the endpoint and upgrading its firmware can be set via:

- The device's Web GUI that can be accessed by inputting the phone's IP address into a web browser
- Our online cloud provisioning platform GDMS.Cloud
- The UCM IP PBX's ZeroConfig feature, which creates a 'plug and play' solution for any devices that are added to the UCM's network
- A remote or local TFTP / FTP / FTPS / HTTP / HTTPS server, Grandstream offers a NAT-friendly HTTP server for firmware upgrades which you can find here

Depending on a school's security and network requirements, this variety of configuration and management options enables the installer to choose the best method for each deployment. In turn, it also means the school's network can easily be upgraded, expanded, and kept secure.

Multi-purpose Keys and SIP Presence

Our series of mid to high-end IP phones support SIP presence and multi-purpose keys (MPK). Multi-purpose keys can be used to assign line keys with multiple functions. Users can monitor extensions, use speed dial numbers, send dual-tone multi-frequency signals during calls, page IP intercoms, and more, all directly from their phone screens. These Grandstream endpoints also support a SIP Presence feature, which improves the MPK feature by integrating with the UCM IP PBX. Not only can users see if a line is busy or available, but they can also monitor/set other statuses such as out of office, in a meeting, Do Not Disturb (DND), on break, or any customized presence. These features can help staff coordinate together efficiently and easily. [Fig 3].

Figure 3: MPK LCD Display

Advanced Telephony Features

Grandstream's desktop endpoints support an assortment of features that give their users a productivity boost in the workplace. Depending on the model, our phones come equipped with:

- Call hold, transfer, and forward
- Audio conferencing
- Call park and pickup
- Shared call appearance
- Bridged line appearance
- Downloadable phonebook
- Call waiting
- Call log
- Customized phone screen
- Off-hook auto-dial
- Auto answer
- Click-to-dial
- Flexible dial plan
- Hot Desking
- Personalized music ringtones
- Music on hold
- Server redundancy and fail-over
- PoE, Wi-Fi, and Bluetooth on select models

Facility Management – IP Intercoms and Facility Access

Keeping a school secured and informed is an important aspect of its communications infrastructure. Grandstream's series of IP Intercoms and Paging devices allow school staff to easily make announcements, two-way or one-way page teachers and students and keep an entire campus informed during emergency events. Meanwhile, our GDS series of facility access systems can be used to manage who has access to a school, when students and visitors may freely enter the school, and how the school can be accessed outside of normal operating hours.

Types of Paging and Paging Groups

Intercom and paging devices are a necessary part of a school's communication needs. Grandstream GSC3500 series of intercoms and speakers can be two-way and one-way paged by IP endpoints. In a school scenario, an administrative phone can utilize MPKs to list out various rooms within the facility for quick two-way or one-way paging calls, like when a student is needed in the office. With a UCM series device, an installer can organize GSC3500 devices into specific paging groups that any one IP endpoint can page to. This allows school administration to page specific sections of a school or the entire facility from one device, for morning announcements as an example. Lastly, all of our intercom and paging devices support multi-cast paging. With this feature, an installer can set dedicated priority levels to devices that page through the GSC series. This is a necessity during emergency situations, when school security needs to be able to communicate over the intercoms, even during other announcements.
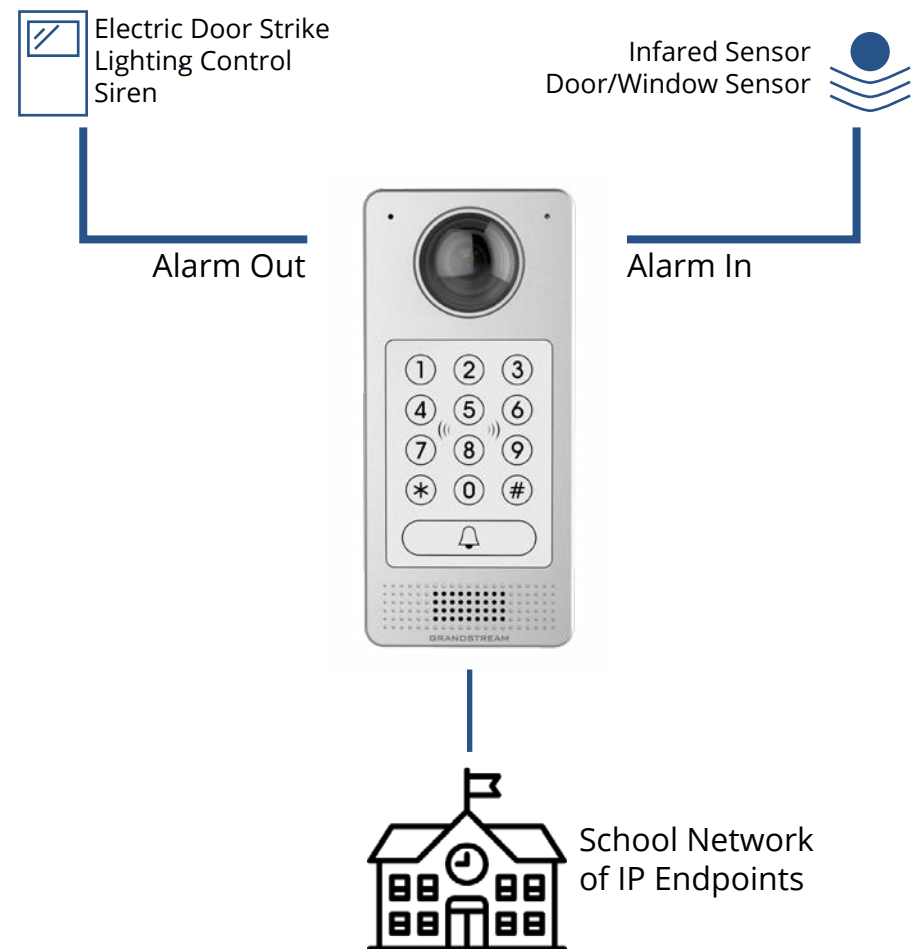
Using the GDS to Secure a School

Grandstream facility access solutions support a variety of features that can be utilized to secure a school's areas of access. Both our GDS3710 HD video door system and GDS3705 audio door system are equipped with alarm in/out ports for interoperability with most third-party security devices such as electric door strikes, sirens, lighting controls, infrared sensors, and door/window sensors. [Fig 4]. Alarm in/out events can be customized based on specific inputs and outputs, which allows a school to create security events specific to its needs.

By pairing with an electric door strike via the alarm out port, a GDS series device has multiple features at hand that can be used to control access to a school. First, it can manage the times that school entrances are locked or unlocked. Next,

GDS devices support key-code, RFID card, and key fob inputs to unlock doors and trigger various alarm-out events. Lastly, most Grandstream endpoints integrate with GDS3500 devices to provide a complete end-to-end solution for access control, video intercom, and security recording needs. Together, these features put facility access completely in the control of the school and security staff members.

Figure 4: GDS Wiring Diagram

Electric Door Strike
Lighting Control
Siren

Infared Sensor
Door/Window Sensor

Alarm Out

Alarm In

School Network
of IP Endpoints

Wireless Networking – Wi-Fi Access Points

Being large network deployments with a multitude of users, schools often require a powerful Wi-Fi environment that can support the mobility needs of teachers, administration staff, and students. Grandstream GWN7600 series of access points can cover large areas with a Wi-Fi signal while supporting hundreds of simultaneous devices. Additionally, the GWN series possesses several important features that are crucial for an education Wi-Fi environment.

Built-in and Cloud Controller Options

In a typical deployment, Wi-Fi access points that are spread across a school facility can be managed by either a GWN's built-in network control or Grandstream's cloud network controller, GWN.Cloud. When utilizing an AP's built-in controller, the access point will function as a manager for all other GWN7600 access points within the network. Through this access point, an entire school's Wi-Fi network can be linked together and configured, managed, and monitored. A built-in controller has its limits, however. Those limits mainly being a hard-cap to the maximum number of subordinate devices and only being accessible by a device that is in-network. Our GWN.Cloud platform is the ideal option for managing an unlimited amount of access points in one network, as well as configuring, managing, and monitoring that network from anywhere.

Captive Portal

Grandstream access points support a captive portal feature that defines a web page to be displayed on a client device when attempting to connect to the internet via the AP. Once connected to the Wi-Fi network, the client device will be forced to view and interact with a landing page prior to proceeding. With captive portals, schools can require users to enter requested information to access the internet, agree to usage terms, and display an expiration time for the Wi-Fi connection.

This setting will help schools keep full control of a Wi-Fi network and monitor students' usage of the internet on school-approved devices.

Wireless IP Infrastructure

While Wi-Fi has a variety of deployment scenarios for educational uses, many of Grandstream's IP endpoints support Wi-Fi. Because of this, schools can save on cost and also keep their IP communications deployment light. Less ethernet wiring means a more flexible and streamlined deployment.

Multiple SSID Channels

By creating multiple SSID channels, a school can dedicate specific networks to staff, students, and guests. Specific network settings and bandwidth can be determined for each of these channels. This can have several benefits, such as;

- Keeping staff networks separated with a dedicated bandwidth
- Giving students with time-limited Wi-Fi access
- Preventing students from accessing blacklisted websites and downloading abnormally large files
- Prioritizing Wi-Fi cordless IP phone voice traffic through the network for a mobile solution.

Up to 16 SSIDs can be created in a given network, each with its own unique network settings.

SSID & Bandwidth Rules

Schools can fully customize SSIDs and bandwidth rules to ensure that students are using Wi-Fi connections on school computers and devices for educational purposes. While there are a wide variety of configurations that can be adjusted, some key settings are:

- Whitelisting and blacklisting specific IPs, such as school computers and staff cordless IP phones
- Specifying upload and download limits on specific SSIDs
- Hidden SSIDs can be created, allow for staff Wi-Fi networks to be hidden from student-accessible devices
- Client time policies that limits the amount of time a client device may maintain a connection to an SSID for
- Time based scheduling allows many bandwidth rules to run on the defined timeline. For example, a public SSID for students to use during recess can automatically become available during this time frame and disabled once classes resume

Learn More about Grandstream Deployments

It is important to understand the key devices and features in Grandstream's portfolio of unified communications and networking devices to build a solution for a school. We have a variety of resources to help you learn more about utilizing Grandstream to create complete communication solutions for schools, offices, hotels, and so much more.

- UC Solutions for Education Systems
- Four Tips for a School's Inbound Call Strategy
- Evolving Your Grandstream Ecosystem - Webinar
- Introduction to Grandstream Wi-Fi - Webinar
- Grandstream School District Deployment - Case Study