



Installation Procedure and Pre-Installation Checklist for the EXTender 6000

The Branch Office EXTender 6000 & the PBXGateway EXTender 6000 are simple to install once you have all the requisite cabling, hardware and network capacity in place. **To make sure your installation goes smoothly, you should complete the following checklist prior to installing the units.** This will be helpful whether you contract out the installation to your equipment provider or a third-party service organization or install the units yourself.

This checklist can be used for:

- Planning and engineering
- Configuration of the Branch Office EXTender

Once you have completed the checklist, you can give it to the technician who will install and configure your EXTender 6000 units to ensure all the requirements for a successful installation have been met.

The basic installation process consists of the following steps:

Pre-Installation Steps:

1. Determine network type and acquire appropriate network termination devices
2. Calculate bandwidth requirements based on number of users and voice compression
3. Provision or increase network capacity (if not already present)
4. Make sure that PBX/KTS and messaging systems have port capacity for branch users
5. Wire remote and switch sites for phones and extended digital ports
6. Acquire appropriate cabling from Branch Office EXTenders to network termination devices

Installation Steps:

7. Install and configure units with network termination devices
8. Connect the units to phones and switch
9. Power on units and let the calling begin!
10. Customize user configurations through management interface as desired

Branch Office EXTender 6000 Pre-Installation Checklist

Section A: Account Profile

Program Manager Contact Information

Company Name:		
Address:		
City:	Prov./State:	Postal/Zip Code:
Contact Name:		Title:
Contact Telephone:		Contact Fax:
Contact E-mail:		Contact Pager/Cell:

Switch Site Installation Information

Contact:		
Address:		
City:	Prov./State:	Postal/Zip Code:
Contact Telephone:		Contact Fax:
Contact E-mail:		Contact Pager/Cell:

Remote Site Installation Information

Contact:		
Address:		
City:	Prov./State:	Postal/Zip Code:
Contact Telephone:		Contact Fax:
Contact E-mail:		Contact Pager/Cell:

Installation Information

Target Installation Date:	Type Of Installation: <input type="checkbox"/> Technician-installed <input type="checkbox"/> Self-installation
Lab/Existing Telephone:	
Technician:	

Sales Contact Information (from whom did you purchase your EXTender 6000?)

Company:	Location:
Sales Rep:	Telephone:
Sales Engineer:	Telephone:

Central Office Information (providing your network connectivity)

Company:	Location:
System Engineer Name:	Telephone:
Account Manager Name:	Telephone:

Step 1: Network Type and Termination Device

Type of Network: <input type="checkbox"/> T1 or Fractional T1 (Complete Section 3.A & 3.1) <input type="checkbox"/> ISDN (Complete Section 3.B & 3.1) <input type="checkbox"/> Frame Relay (Complete Section 3.A & 3.1) <input type="checkbox"/> 56/64K Digital Data Service (leased line) (Complete Section 3.C & 3.1) <input type="checkbox"/> Ethernet IP <input type="checkbox"/> Other: _____	Type Of Network Termination Device: <input type="checkbox"/> Branch location: Make/Model Number: _____ <input type="checkbox"/> Switch location: Make/Model Number: _____
<input type="checkbox"/> Network is already installed <input type="checkbox"/> Network will be installed on: _____ <input type="checkbox"/> Network provider: _____ <input type="checkbox"/> Network has been tested by: _____ <input type="checkbox"/> Date: _____	Network Termination Device provides <input type="checkbox"/> Synchronous clear channel connection with <input type="checkbox"/> V.35 Interface “or” <input type="checkbox"/> RS-232 Interface “or” <input type="checkbox"/> V.530 Interface <input type="checkbox"/> 10BaseT Ethernet IP connection

Step 2: Bandwidth Requirements

One of the most important factors in the success of your EXTender 6000 is to determine the necessary network bandwidth needed for your application. This section will explain how to determine the size of the required bandwidth that will be used in your application of the EXTender 6000 units. Determining the appropriate bandwidth is a function of two factors:

- Number of Users (Phones)
- Voice Compression for Each User

Number of Users

The number of users is the number of simultaneous users (digital PBX phones) that will be extended at any given branch location. Physically, there could be up to eight simultaneous users for one EXTender pair. Statistically, not all users will be on the phones at the same, so you may be able to decrease bandwidth and still maintain high performance.

Switch/Remote Bandwidth Requirements

Voice Compression

The EXTender 6000 deploys voice compression in order to extend multiple users across fewer data channels. The EXTender 6000 supports the following voice compression algorithms: G.711, 32 Kbps ADPCM, 24 Kbps ADPCM and G.729A. Depending on the voice compression algorithm selected, you may need anywhere from 16 Kbps (G.729A), 40 Kbps (ADPCM32) or 72Kbps (G.711) per user.

Compression Algorithms and the Corresponding Bandwidth Size

G711	ADPCM32	ADPCM24	G.729A
No Compression	32 (40 w/signaling) Kbps	24 (32 w/signaling) Kbps	8 (16 w/signaling) Kbps

Using the bandwidth management chart below, you can determine the total bandwidth necessary to support your application. If you have excess bandwidth on your network circuit, your network terminating devices could allow you to use that bandwidth to connect to a router or even another EXTender 6000. In order to accomplish this, you must have the multi-port capability on your network service terminating device. For more information on your network terminating devices, please see the Network Terminating Equipment section of the System Administrator’s Guide.

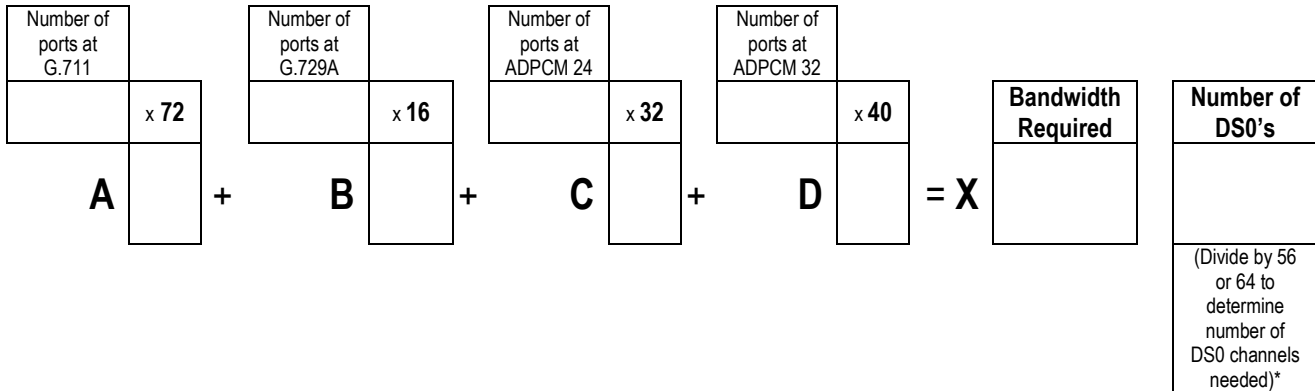
Selecting the Proper Voice Compression

The best voice quality is achieved by using the ADPCM32 compression. However, the maximum quality comes at the expense of the highest utilized bandwidth. The highest degree of voice compression is

achieved by using the G.729A. If you are using this algorithm, you will significantly save on the bandwidth and still achieve voice quality that is regarded as near toll. If absolute conversation quality is your goal and bandwidth is not a constraint, you probably want to select ADPCM32. If you are conserving bandwidth, you might employ the G.729A.

You can also vary the compression per user. If you have support reps handling sensitive customer calls or people who use the conferencing feature often, you might want to assign the highest quality, ADPCM 32 to those users. Others in the organization, perhaps engineers or accountants, may use the phone much less often and can be assigned G.729A (which is near-toll quality) to conserve bandwidth.

If you are using different compression algorithms for each individual user (port), use the following formula to establish your aggregate data bandwidth needs.



NOTE: If your DS0s on your CSU/DSUs are set up for 56Kbps, use 56 and if they are set up for 64Kbps DS0s, use 64.

Step 3: Provision or Increase Network Capacity

Based on the bandwidth requirements you calculated in Step 2, make sure your network has adequate bandwidth provisioned. You may also want to consider a back-up plan when you calculate your bandwidth and network types. For example, if you are using T1 as your primary network connection on WAN1, you might want to provision an ISDN line for redundancy on WAN2.

Line Information

To assist you in setting up your network termination device (CSU/DSU, MUX, etc.), it will be helpful to record the following information from your service provider and network configuration.

Please complete appropriate section in reference to network service being implemented with the Branch Office EXTender and Branch Office Configuration Hardware (*section 3.1*).

3.A T1/FT1 Line Provisioning & Misc. Information

Note: One 24 Channel T1 Circuit can support with 12 BOE's up to ninety-six (96) digital sets fully functional concurrently with G.729a compression selected for all ports. This equates to two (2) DS0's provided to each BOE with eight (8) digital sets being supported by each one respectively. **Or** one 24 Channel T1 Circuit could support twenty-four (24) Branch Office EXTenders (1 per DS0) with a total of 192 digital sets but of which only four (4) could be concurrently active per BOE on the respective Channel for a total of 96 sets active concurrently. For this to occur, network service terminating equipment must have the channelizing capacity to 24 ports on the device.

T1/PRI Framing (Recommended ESF):						T1/PRI Line Coding (Recommended B8ZS):					
T1/ISDN PRI			E1			T1/ISDN PRI			E1		
<input type="checkbox"/> T1SF <input type="checkbox"/> T1ESF <input type="checkbox"/> Other _____			<input type="checkbox"/> E1CRS4MFFEBE <input type="checkbox"/> E1CRC4MF1 <input type="checkbox"/> E1BF1 <input type="checkbox"/> No framing <input type="checkbox"/> Other _____			<input type="checkbox"/> AMI <input type="checkbox"/> B8ZS <input type="checkbox"/> B7ZS <input type="checkbox"/> No coding <input type="checkbox"/> Other _____			<input type="checkbox"/> HDB3 (mandatory)		
DS0 Mapping (x = 1 – 24)											
DS0	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6	Port 7	Port 8	Port 9	Port 10	Not Used
X – xx	__-__	__-__	__-__	__-__	__-__	__-__	__-__	__-__	__-__	__-__	__-__
Network Service Device (CSU/DSU) Physical Ports											
Port 1: <input type="checkbox"/> BOE Data <input type="checkbox"/> LAN/WAN Data Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female			Port 2: <input type="checkbox"/> BOE Data <input type="checkbox"/> LAN/WAN Data Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female			Port 3: <input type="checkbox"/> BOE Data <input type="checkbox"/> LAN/WAN Data Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female			Port 4: <input type="checkbox"/> BOE Data <input type="checkbox"/> LAN/WAN Data Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female		
Port 5: <input type="checkbox"/> BOE Data <input type="checkbox"/> LAN/WAN Data Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female			Port 6: <input type="checkbox"/> BOE Data <input type="checkbox"/> LAN/WAN Data Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female			Port 7: <input type="checkbox"/> BOE Data <input type="checkbox"/> LAN/WAN Data Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female			Port 8: <input type="checkbox"/> BOE Data <input type="checkbox"/> LAN/WAN Data Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female		
Port 9: <input type="checkbox"/> BOE Data <input type="checkbox"/> LAN/WAN Data Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female			Port 10: <input type="checkbox"/> BOE Data <input type="checkbox"/> LAN/WAN Data Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female			Port Not Used: Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female			If Additional Port Space Is Needed To Support Additional BOE's, Please Photo Copy This Page And Mark Respective Ports and Usage On That Page As Necessary.		
Switch PBX/KSU Digital Port Cross Connect Date: _____ / _____ / _____						Remote Digital Station Port Runs & Cross Connect Date: _____ / _____ / _____					
Network Service (T1/FT1) Circuit ID: _____											

3.B ISDN Line Provisioning & Misc. Information

Note: If X from **Step 2** is greater than 128Kbps, ISDN service will not provide adequate bandwidth for 8 digital sets functional concurrently. One ISDN 2B+D Circuit can support up to eight (8) digital sets fully functional concurrently with G.729a compression selected for all ports. **Or** one ISDN 2B+D Circuit could support two (2) Branch Office EXTenders with a total of 16 digital sets but of which only 4 could be concurrently active per BOE on the respective B Channel for a total of 8 sets active concurrently. For this to occur, network service terminating equipment (TA) must have the capacity of two data ports.

Port 1: <input type="checkbox"/> BOE Data <input type="checkbox"/> LAN/WAN Data Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female						Port 2: <input type="checkbox"/> BOE Data <input type="checkbox"/> LAN/WAN Data Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female					
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ISDN Line Provisioning	<input type="checkbox"/> Both Channels Circuit Switch Voice & Data (CSVD)
Switch PBX/KSU Digital Port Cross Connect Date: ____ / ____ / ____	Remote Digital Station Port Runs & Cross Connect Date: ____ / ____ / ____
Switch ISDN Network Service Circuit ID:	
Remote ISDN Network Service Circuit ID:	

3.C Leased Line Provisioning & Misc. Information

<p>Note: If X from Step 2 is greater than 128Kbps, 56/64K Digital Data Service (DDS) Leased Line will not provide adequate bandwidth for digital set functionality. One DDS Circuit can support up to eight (8) digital sets at the remote location, of which four (4) can be fully functional concurrently with G.729a compression selected for all ports. Two DDS circuits can be provided to the BOE for bandwidth to support the 8 sets concurrently.</p>	
Port 1: <input type="checkbox"/> BOE Data Physical Interface: <input type="checkbox"/> Winchester Female <input type="checkbox"/> DB-25 Female	
Switch PBX/KSU Digital Port Cross Connect Date: ____ / ____ / ____	Remote Digital Station Port Runs & Cross Connect Date: ____ / ____ / ____
DDS Network Service Circuit ID:	

3.1 Branch Hardware Configuration Information

Switch EXTender Name (Optional) : Up To 16 Characters	BOE #1 _____ BOE #2 _____ BOE #3 _____ BOE #4 _____ BOE #5 _____ BOE #6 _____ BOE #7 _____ BOE #8 _____
Switch EXTender IP Address (Optional) :	BOE # 1 ____ . ____ . ____ . ____ BOE # 2 ____ . ____ . ____ . ____ BOE # 3 ____ . ____ . ____ . ____ BOE # 4 ____ . ____ . ____ . ____ BOE # 5 ____ . ____ . ____ . ____ BOE # 6 ____ . ____ . ____ . ____ BOE # 7 ____ . ____ . ____ . ____ BOE # 8 ____ . ____ . ____ . ____
Switch EXTender IP Address Default Router (Optional) :	____ . ____ . ____ . ____
Switch EXTender IP Subnet Mask (Optional) :	____ . ____ . ____ . ____
IP Address Switch Network Terminating Device (Optional) :	____ . ____ . ____ . ____

Remote EXTender Name (Optional) : Up to 16 Characters	BOE #1 _____ BOE #2 _____ BOE #3 _____ BOE #4 _____ BOE #5 _____ BOE #6 _____ BOE #7 _____ BOE #8 _____
Remote EXTender IP Address (Optional) :	BOE # 1 ____ . ____ . ____ . ____ BOE # 2 ____ . ____ . ____ . ____ BOE # 3 ____ . ____ . ____ . ____ BOE # 4 ____ . ____ . ____ . ____ BOE # 5 ____ . ____ . ____ . ____ BOE # 6 ____ . ____ . ____ . ____ BOE # 7 ____ . ____ . ____ . ____ BOE # 8 ____ . ____ . ____ . ____
Remote EXTender IP Address Default Router (Optional) :	____ . ____ . ____ . ____
Remote EXTender IP Subnet Mask (Optional) :	____ . ____ . ____ . ____
IP Address Remote Network Terminating Device (Optional) :	____ . ____ . ____ . ____

Step 4: Wire Remote Site for Phones

Make sure that your branch office has been wired for your digital sets, and that you have phones available. We also recommend that you have an analog phone somewhere in your branch for emergencies or back-up (this could be your fax machine).

Remote – Block Punchdown

<input type="checkbox"/> Remote RJ21 (Male) port to punch down block – 110 or 66 (marked)	
Remote Punchdown 1) _____ 2) _____ 3) _____ 4) _____ 5) _____ 6) _____ 7) _____ 8) _____	Extension (DN) Assigned 1) _____ 2) _____ 3) _____ 4) _____ 5) _____ 6) _____ 7) _____ 8) _____

Step 5: Check PBX/KTS Configuration, Capacity

Make sure that you have digital ports available on your PBX for each user at the branch office, the ports are programmed in the PBX and punched down to the block, and that your voicemail, unified messaging, ACD and accounting systems have adequate capacity to support your branch users.

Switch – PBX Programming – Block Punchdown

<input type="checkbox"/> Switch digital port setup/functional and RJ21 (Male) port to punch down block – 110 or 66 (marked)	
Switch Digital Shelf/Card/Slot/Port 1) _____ 2) _____ 3) _____ 4) _____ 5) _____ 6) _____ 7) _____ 8) _____	Extension (DN) Assigned 1) _____ 2) _____ 3) _____ 4) _____ 5) _____ 6) _____ 7) _____ 8) _____

Step 6: Cabling

Review this section carefully and make sure that you have the necessary cables before you begin installation. Note: The cables that are included with the EXTender units are the power & RS530 (DB25 male → DB25 female) for both units & the serial cable with remote unit. Other cables and accessories are readily available through a computer supply source or through MCK. Call Sales at 1-888-454-7979 to order your cables.

EXTender Cabling & Other Information

Switch (PBX / KSU Location)

- Serial cable for / to management station (Female DB-9 port on BOE)
- Ethernet Cable (**Optional**) – twisted pair (10BaseT) for connectivity to TCP/IP data network hub for management capabilities (TelNet)
- Cable for connectivity EXTender 6000 (BOE) to Network Terminating Equipment (NTE)
 - M34 Winchester Male (NTE) → DB25 Female (BOE) “**or**”
 - DB25 Male (NTE) → DB25 Female (BOE) “**or**”
 - DB25 Male **and** M34 Adapter → DB25 Female to Winchester Male
- Switch digital line card port punch down to block for cross connect to RJ-21 port on Switch Branch Office EXTender for digital station ports being extended.

Note: MCK recommends that cross connects for digital ports being extended be done to a separate block.
DB25 Male to Female cable is included with each Branch EXTender Unit.

Remote Branch Site:

- Serial cable for / to management station
- Ethernet Cable (**Optional**) – twisted pair (10BaseT) for connectivity to TCP/IP data network hub for management capabilities (TelNet)
- Cable for connectivity EXTender 6000 (BOE) to Network Terminating Equipment (NTE)
 - M34 Winchester Male (NTE) → DB25 Female (BOE) “**or**”
 - DB25 Male (NTE) → DB25 Female (BOE) “**or**”
 - DB25 Male **and** M34 Adapter → DB25 Female to Winchester Male

- Station runs to punch down block for cross connect to RJ-21 port on Remote Branch Office EXTender for digital station ports being extended.

DB25 Male to Female cable is included with each Branch EXTender Unit.

Introduction

The EXTender 6000 connects to network devices via one or two male DB-25 connectors, labeled WAN1 and WAN2.

The WAN ports recognize three synchronous protocols;

- RS-232 (see figure *A* for pinouts)
- V.35 (see figure *B* for pinouts)
- RS-530 (see figure *C* for pinouts)

Note: The data port of the network terminating device must support one of above protocols operating in a synchronous manner.

Wiring Info

Figure *A* through *C*, lists each pin within the DB-25 connector with the signal description and signal/voltage source, using the Electronics Industry Association (EIA) standard.

Note: The WAN ports on the back of the EXTender 6000 are DB-25 Male. RJ21 port on the back of the EXTender 6000 is 50-Pin Male.

Cables Available From MCK

DB-25 Male to DB-25 Female

- MCK # A-CDB25MF-1

M34 Adapters – DB-25 Female to Winchester Male

- MCK # A-ADB25M34

Cables Available From Black Box

Telephone: 724-746-5500

DB-25 Male to Female

- Black Box # EVN530-005-MF

M34 Adapters – DB-25 Female to Winchester Male

- Black Box # FA059

Connector Pinout Information

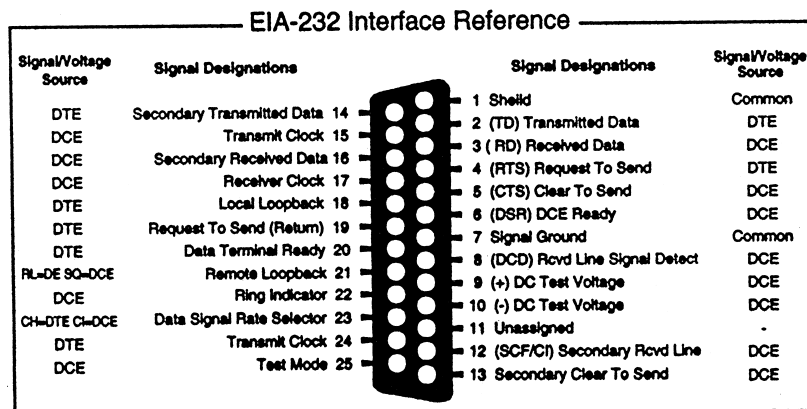


Figure A. RS-232 Cable Pinouts

V.35 on DB-25

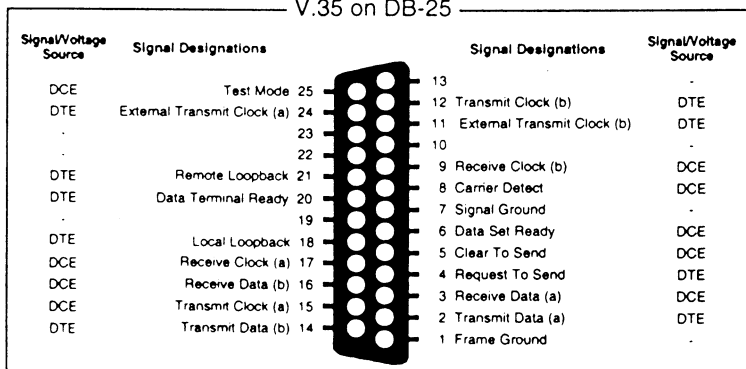


Figure B. V.35 Cable Pinouts

EIA-530 Interface Reference

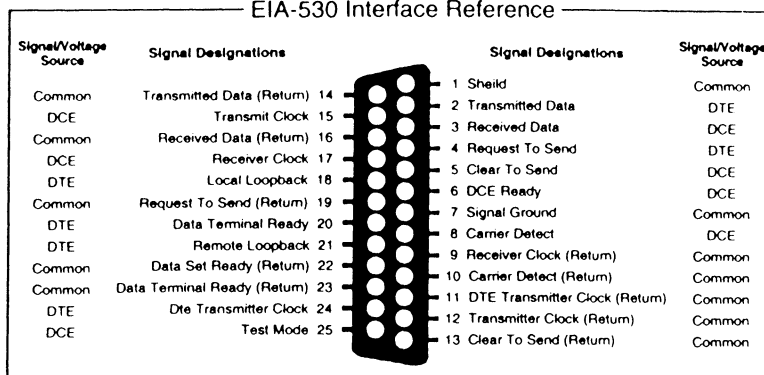


Figure C. RS-530 Cable Pinouts

Step 7: Branch Office EXTender 6000 Installation

Complete, step-by-step instructions are available in the System Administrator's Guide (**included with switch unit(s)**) and the Quick Installation Guide (**included with remote unit(s)**). Once all the components are in place, cabling is a simple process.

Step 8: Power On!

Once the units are cabled to the network device and to the phones and switch and the network is up and running, you are ready to power on. Since the units come pre-configured with default settings (G.729a compression / 384k bandwidth / V.35 protocol), you should be able to place and receive calls immediately.

Step 9: Customize Configuration

Most likely, you will want to customize the configuration to reflect your company's needs. For example, you can change compression options per user, assign passwords, increase or decrease bandwidth, and customize many other functions. Again, complete instructions for using the management interface are included in the System Administrator's Guide.