IVX® S-Class

WITH Integrated Answering Machine™

Installation Manual

0450-0489
Rev. G

esi

We Make It Easy To Communicate

About ESI

ESI (Estech Systems, Inc.) is a privately held corporation based in Plano, Texas. Founded in 1987, ESI designs and builds innovative telecommunications products for businesses like yours. Because of their powerful combination of value and features, ESI products are consistently recognized by industry publications and leaders.

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General description

Welcome to **IVX**® **S-Class** (*IVX* stands for *Integrated Voice Exchange*). IVX S-Class offers the small business an all-in-one phone system including not only phone service but also an Integrated Answering Machine™. The system itself is housed in a surprisingly small case that is wall-mounted in the telephone equipment room. An external, wall-mounted power transformer powers the system.

IVX S-Class with Integrated Answering Machine offers slightly different features than IVX S-Class models with full voice mail and auto attendant. The Integrated Answering Machine allows up to two people to leave messages simultaneously and accepts a total of 30 minutes of voice message storage.

> **Note:**   This manual uses the term *Generation II* to refer to IVX S-Class systems introduced in 2004.

Telephone system features

IVX S-Class has a four-line, eight-station, two analog port configuration.

- **Impressive expansion capacity** — Handles up to 12 CO lines and up to 24 stations.

- **ESI Feature Phones** — Compact and stylish, yet rugged, the 48-Key Digital Feature Phone and the 24-Key Digital Feature Phone each include a high-quality speakerphone, an informative multi-functional display, and a specially designed key layout with several dedicated keys to minimize or eliminate the need to memorize codes. An Expansion Console is available for the 48-Key Digital Feature Phone; and each 48-Key Feature Phone model includes an integrated headset jack.[1] ESI also offers the 12-Key Digital Feature Phone with similar design and basic functions. At least one 24- or 48-Key Digital Feature Phone must be purchased with each S-Class system.

- **Extensive help** — Easily accessible with one press of the **HELP** key, ESI's Verbal User Guide™ uses spoken and displayed help prompts to help everyone from the Installer through the Administrator down to the least experienced end user. You may also go to *www.esiusers.com* for up-to-date online help.

- **Intelligent Caller ID** — Allows one-touch automatic message return.[2]

- **Call waiting** — Includes helpful display, showing both calls' Caller ID information, and easy one-key toggling between calls.

- **Conference calling** — Includes two conference bridges, and a conference may contain up to four parties, so IVX S-Class can support two conferences of four parties each. Analog phones on the system also may be parts of conferences.

- **Esi-Dex**™ **speed-dialing** — Calls any number using three separate lists (personal, station, and system); uses Caller ID[1] information or direct keypad entries.

- **Dedicated overhead paging interface** — Allows for external paging through overhead speakers or multi-zone paging units (amplification required).

- **911 alert** — Provides immediate line access if any station with line access dials **9 1 1** to report an emergency; sends a message via the serial port indicating the start date, time, station number and end-time of the 911; also sounds a warning tone at the operator station and displays, for example:
  911 CALL FROM
  X102 JOHN JAMES

- **Status indicator lamp** — Indicates three conditions of the 48 and 24-Key Digital Feature Phone: off-hook, ringing, and new voice mail message.

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[1] If shipped on or after March 1, 2004.
[2] This and all other references to Caller ID service within this manual assume the end-user organization subscribes to Caller ID service from its telephone service provider.

Integrated Answering Machine features

*   **Two voice mail ports** — These are **in addition to** the up to 56 possible call-processing ports[1]; thus, you may build the system to its maximum for call-handling without having to balance voice mail needs versus call-handling needs.

*   **Highest-grade voice quality** (64-kilobit/second sampling) for voice mail and other storage of voice messages. IVX S-Class with Integrated Answering Machine offers 30 minutes of storage.

*   **Integrated Answering Machine** can record up to two simultaneous calls. Messages can be retrieved by any authorized 12, 24 or 48-Key Feature Phone or remotely from an off-premises location. The system can also be programmed to either call an off-premises number or commercial network to deliver messages.

*   **Message-on-hold recordings** — Up to four recordings: three prerecorded and one live entry.

*   **Message Recycle Bin** (undelete) — Remembers, and can restore, the Integrated Answering Machine's 10 most recently deleted messages.

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[1] IVX S-Class Generation II. IVX S-Class Generation I has up to 42 possible call-processing ports.

Hardware overview/installation

IVX S-Class with Integrated Answering Machine consists of a four-line, eight-station, two-analog-port system cabinet with voice mail and automated attendant. The system can expand to up to 12 lines, 24 digital stations and six analog ports. The two S-Class Generations have the following capacities:

IVX S-Class system with Integrated Answering Machine	Voice mail ports	CO lines	Digital stations	Analog ports	Message storage
Generation II (IVX 56s)	2	16	32	8	30 min.
Generation I (IVX 42s)	2	12	24	6	30 min.

Base Cabinet

The wall-mounted **Base Cabinet** measures $8^{1}/_{2}''$ W × 11″ H × 3″ D, and is designed for easy installation and easy component access. It houses the Memory Module and Main Board (with a 4x8x2 configuration), one multi-purpose serial port, a MOH connector and another port card slot — which accepts an additional 482 port card. The Base Cabinet can support one **Expansion Cabinet**, for a potential total of either two or three port cards and one 4x8x2 main board.

Expansion Cabinets

You can "piggy-back" an **Expansion Cabinet** to the front of the IVX S-Class Base Cabinet (see page B.8). Depending on the S-Class system, the Expansion Cabinet houses either one or two additional port cards, enabling the system to grow to its maximum configuration — two or three port cards:

IVX S-Class system	Additional 482 port cards Expansion Cabinet can house	Maximum port cards for system
Generation II (IVX 56s)	2	3
Generation I (IVX 42s)	1	2

Main board

The main board combines leading-edge hardware components — including a Motorola♦ ColdFire® processor and DSP structure — along with proprietary operating system software. The board provides: system control of the Memory Module and port cards; a standard RS-232C DB9 serial port; a built-in 33.6 Kbs modem for remote access; an external paging-device interface; and MOH interface. The S-Class main board has a four-line, eight-digital station, two-analog port configuration.

Port card

There is only one port card type available for S-Class. The **482 port card** is equipped with a standard female amphenol connector for easy wiring to a standard 66 or 110 block. The S-Class 482 port card cannot be used on any other ESI phone system.

> **Warning:** 482 port cards for IVX 42s (Generation I) **are not compatible** with IVX 56s (Generation II); use **only** port card boards marked *5010-0579* with S-Class main boards marked *5010-0578*.

The 482 port card provides circuits to connect up to four loop-start CO lines, eight Digital Feature Phones, and two analog station ports. The CO line ports support standard CO and Centrex loop-start lines; ground-start CO lines are not supported. The analog ports provide a standard 24-volt, two-wire connection to fax machines, analog phones, and modems. Only one analog device can be connected to each analog station port. This card uses ten station ports and four CO ports when installed.

> **Notes:** The S-Class main board comes in a four-line, eight-digital station, two-analog port configuration. You can add either two[1] or three[2] 482 port cards on an S-Class system. Therefore, the system can have the following configurations.
> – **4 x 8 x 2:** Base Cabinet (main board only)
> – **8 x 16 x 4:** Base Cabinet with one 482 port card.
> – **12 x 24 x 6:** Base Cabinet with one 482 port card and an Expansion Cabinet with one 482 port card.
> – **16 x 32 x 8** (Generation II only)**:** Base Cabinet with one 482 port card and an Expansion Cabinet with two 482 port cards.
> Also: the system must contain at least one 482 port card to access both conference bridges.

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[1] IVX S-Class Generation I.
[2] IVX S-Class Generation II.

Wall-mount transformer

The **System Cabinet** requires a 3-amp transformer (supplied).

Memory Module

The **Memory Module**[1] consists of a CompactFlash® card. The memory module on IVX S-Class contains all system programming and configuration data, including pre-loaded voice prompts.

Digital Feature Phone models

IVX S-Class supports three different models of **ESI Digital Feature Phones**:

- **48-Key Digital Feature Phone** — Three-line, 56-character[2] display; speakerphone; 30 programmable feature keys, built-in headset jack[3].
- **24-Key Digital Feature Phone** — Two-line, 32-character display; speakerphone; 12 programmable feature keys.
- **12-Key Feature Phone** — One-line, 16-character display; nine programmable feature keys.

Each model connects to the cabinet via standard two-wire twisted pair.

TAPI Phone

The **TAPI Phone** is an optional version of the 48-Key Digital Feature Phone. It provides a TAPI cable and adapter to facilitate connection to a PC serial port for **Basic Telephony Integration** to such standard packages as *Act!*®, *Goldmine*®, and *Microsoft Outlook*. A Digital Feature Phone cannot be field-upgraded to a TAPI Phone.

> **Note:**   Use the wall hook located under the handset when the phone is in the most upright position to keep the handset in place.

60-Key Expansion Console

The **60-Key Expansion Console** adds 60 additional programmable feature keys to a designated user's extension.[4] The console is connected to its host phone via a special cable (provided) and **doesn't** require a separate station port of its own.

> **Note:**   Up to four 60-Key Expansion Consoles can be installed in a fully configured system.

Feature Phone overlays

Each ESI Phone comes with one overlay for the programmable feature keys. To order additional overlays, visit the DESI™ website at *www.desi.com*. You can also download the free *Windows*-based software, *DESI Lite*, which allows you to print on the overlays. For assistance with DESI products, please consult the DESI website.

> **Tip:**   Remember that ESI's *Esi-Access* software, available from *www.esiresellers.com*, also lets you print on the overlays as well as perform many other programming tasks.

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[1]   Memory Modules are packaged separately and are mounted in the cabinet during installation.
[2]   The top two lines each have 16 characters, as on the 48-Key Digital Feature Phone; the bottom line has 24 characters.
[3]   If shipped on or after March 1, 2004.
[4]   Must be a 48-key model.

Cautions

> **Important:** This information complies with the requirements of Underwriters' Laboratories (UL) and UL Standard 60950.

When using this telephone equipment, always exercise basic safety precautions in order to minimize the risk of fire, electric shock or injury to persons. **Before proceeding, please read the following:**

- The airflow vents on the IVX case **must** be free of obstruction for proper cooling. Similarly, **do not** install the cabinet in areas of extreme heat or improper ventilation. **Never** insert objects of any kind through the ventilation slots on the system cabinet; doing so may result in contact with dangerous voltages — or cause an electrical short capable of producing fire or shock.

- **Do not** use liquids or aerosols to clean any IVX equipment; rather, use a cloth that is only **slightly** damp.

- The IVX system contains **no** components that are serviceable by either non-Resellers or non-manufacturer technicians. **All service must be referred to the Reseller for further handling.**

- To reduce the risk of fire, use **only** 26 AWG or better telecom wire.

Power supply

Always disconnect the power supply and telephone lines from the system cabinet **before** opening the case for service or component disassembly or replacement.

Heed all warnings and instructions in documentation or marked on the cabinet or peripheral equipment.

> **Note:** If necessary, review "Wall-mount transformer" (page B.3) for information on the type of power supply for IVX S-Class.

Fuse

Contact the factory **before** attempting to replace the fuse. The fuse is marked with "F1" and is located in the upper right-hand corner (when the system is installed on the wall) of the main board.

Battery

> **"Caution:** There is a danger of explosion if the onboard lithium battery is incorrectly replaced. Replace only with Ray-O-Vac BR1225 (or equivalent). Dispose of used batteries according to the battery manufacturer's instructions."

Regulatory information

United States of America

Registration

The CO line telephone numbers, FCC registration number, and ringer equivalence number (REN) of this equipment must be provided to the telephone company before installation. (See below for FCC registration number and ringer equivalence number.)

FCC Part 15

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and — if not installed and used in accordance with the instruction manual — may cause harmful interference to radio communications (in which case, the user will be required to correct the interference at his/her own expense).

FCC Part 68

This equipment complies with Part 68 of the FCC Rules. On the side of this equipment is a label that contains, among other information, the FCC Registration Number and Ringer Equivalence Number (REN) for this equipment. You must, upon request, provide this information to your telephone company.

The REN is helpful to determine the quantity of devices you may connect to your telephone line and still have all of those devices ring when your telephone number is called. In most, but not all, areas, the sum of the RENs of all devices connected to one line should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN, you should contact your local telephone company to determine the maximum REN for your calling area.

If your telephone equipment causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, the telephone company will notify you in advance but, if advance notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

Your telephone company may make changes to its facilities, equipment, operations or procedures that could affect the proper functioning of your equipment. If so, you will be notified in advance, to give you an opportunity to maintain uninterrupted telephone service.

If you experience trouble with this telephone equipment, the telephone company may ask that you disconnect this equipment from the network until the problem has been corrected or until you are sure that the equipment is not malfunctioning.

This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs.

Installation: The device is equipped with a USOC connector.
Registration Number: 1T1MF08B33727.
Ringer equivalence number (REN): 0.8

Hardware installation

Site location

As with most electronic equipment, the environmental considerations for this site need to observe good common sense. Provide a dry, clean, and accessible area.

Locate space in the telephone equipment room, which will provide easy connection to the 66 blocks and 110VAC power. **The location should be no further than 1,000 feet from the farthest station.**

Ambient room temperature must be 40^0–80^0 (F.), and relative humidity no higher than 90%.

> **Notes: Do not** place the equipment or run station cabling near high voltage electrical equipment or electrical lines susceptible to high voltage surges from air conditioner compressors, etc.
> **Do not** mount the equipment in a place that receives direct sunlight.

The system and supporting components should be mounted to a half-inch (or thicker) plywood backboard. Here is the layout of a typical IVX S-Class installation:

IVX S-Class typical installation

Optional music source

IVX S-Class
All-In-One DIgital Phone System
esi

Station ports 100–107

Analog ports 132–133 (Generation II) or 124–125 (Generation I)

OH paging interface

CO lines 1–4

Power supply

Ground
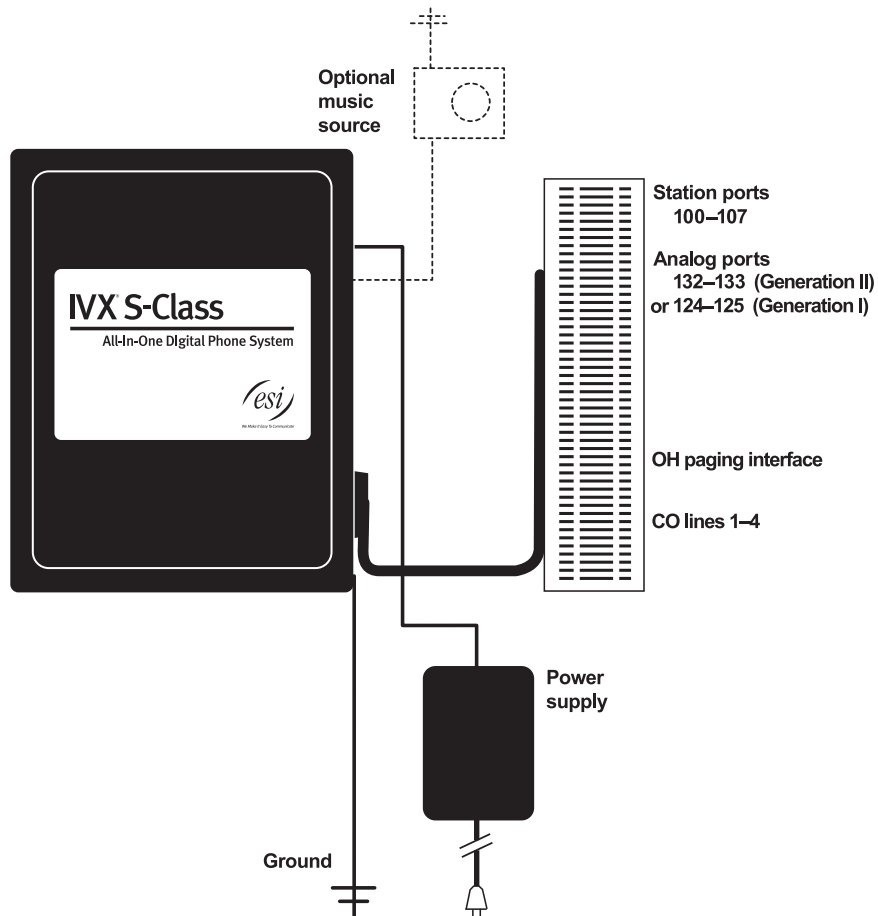
Opening the cabinet

The lid on all cabinets is held in place by two tabs that rest in slots in the bottom of the case, and a release tab that snaps into an opening in the top-center of the cabinet and is secured by a retaining screw.

To remove the lid:

1. Remove the retaining screw and depress the release tab at the top of the cabinet.
2. Rock the lid back from the top.
3. Lift and pull the lid free from the slots in the bottom of the cabinet.
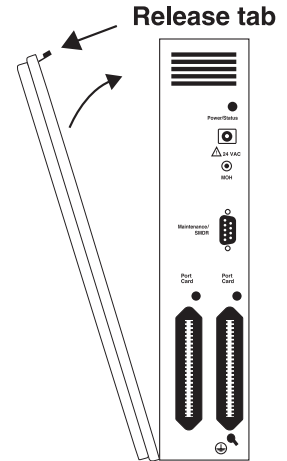
Mounting the cabinet

Use three #8 hex-head screws. Note the position of the three mounting holes in IVX.

1. Screw in the top screw to the backboard (at least half-inch thick plywood) leaving about one-eighth-inch clearance between the screw head and the plywood.

2. Hang the unit using the keyhole at the top of the case.

3. Level the unit and install the bottom two screws.

Attach the power transformer to the wall, allowing sufficient length in both cords to reach the power connector on the upper right side of the cabinet and to reach a UPS or a dedicated 110 VAC outlet.
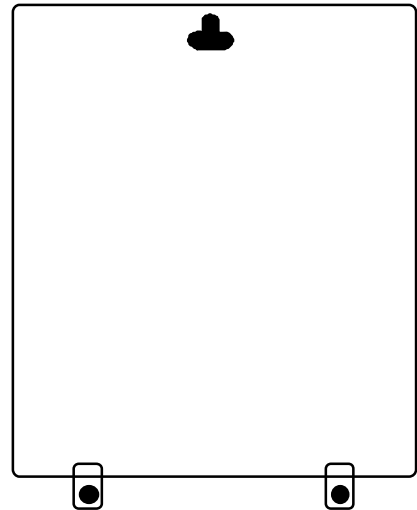
Expansion Cabinet installation

The Expansion Cabinet provides for the expansion of each Base Cabinet with one additional port card (in addition to the one additional port card slot available on the Base Cabinet). The Expansion Cabinet houses up to two port cards connected via ribbon cables through the opening in the back of the Expansion Cabinet to the Base Cabinet.

IVX S-Class Generation II houses up to three port cards, as shown.

To install an Expansion Cabinet:

1. Wear a grounding strap and avoid unnecessary movement while handling the circuit boards.

2. Unplug the power to the IVX S-Class system.

3. Remove the Base Cabinet lid by pressing the release tab at the top of the Cabinet and rock back the lid from the bottom of the Cabinet.

4. Install the Expansion Cabinet on the front of the Base Cabinet in place of the Base Cabinet's lid.

5. Lock the Expansion Cabinet to the Base Cabinet by snapping the top in place and reinstalling the retaining screw.

6. Connect the grounding strap from the Expansion Cabinet's grounding lug (located on the bottom of the cabinet) to the Base Cabinet's grounding lug. Follow the grounding procedures as described earlier for grounding the Base Cabinet.

7. Through the large opening in the back of the Expansion Cabinet, connect the ribbon cable as follows:
   - On IVX S-Class Generation I — Connect J1 on the port card to J2 on the card directly below.
   - On IVX S-Class Generation II — Connect J5 on the port card to the J6 on the card directly below.

8. Re-install the original lid from the Base Cabinet on the face of the Expansion Cabinet.
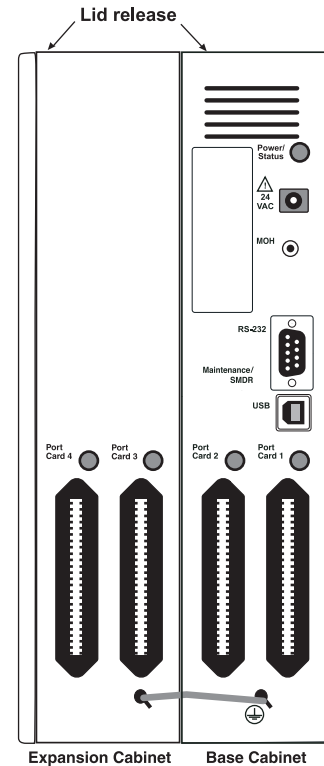
Port card installation

Adding or replacing port cards will require the system to be taken out of service. Wear a grounding strap and avoid unnecessary movement while handling the circuit boards.

1. Unplug the power supply to IVX.
2. There are two card slots on each cabinet (Base Cabinet and Expansion Cabinet). Each card is ribbon-cabled to the port card directly below it.

   > **Note:** The first Amphenol connector (Port Card 1 slot) is occupied by the main board, which comes in a four-line, eight-digital station, two-analog port configuration.

3. Using the ribbon cable that shipped with the port card, connect the port card in the Base Cabinet to the main board as follows:
   • On IVX S-Class Generation I — Connect J1 in the Base Cabinet to J1 on the main board.
   • On IVX S-Class Generation II — Connect J5 in the Base Cabinet to J5 on the main board.
4. Secure the port card to the standoffs with the screws that shipped with the port card.
5. To remove the port card, reverse steps 1–4.
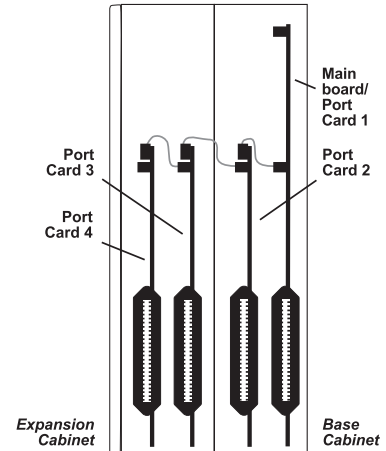
Memory Module

> **Note:** The Memory Module has a **proprietary** formatting scheme — **do not** attempt to install a non-ESI CompactFlash®. Contact ESI for a replacement Memory Module, if needed.

Adding or replacing the Memory Module will require that the system be powered down.
Replacing the Memory Module erases all its configuration data and custom recordings. (Prompts stay intact, however.)

LED functions

The unit's various LEDs are designed to provide visual feedback as follows:

• **Power** LED — Located on the top-right side of the cabinet. Is illuminated when power is being applied to the system. Blinks periodically to indicate that the main processor is operational.
• **Port** LEDs — Located above their respective amphenol connectors on the right side of the cabinet. Each is illuminated when any port on its associated port card is in use.

   > **Note:** Disconnecting an amphenol connector when its respective LED is lit will cause any of its ports that are in use to be disconnected.

Upon power-up, approximately one minute is required for the system to configure. The **Power** and **Port** LEDs will blink three times to indicate that the power-up sequence has been completed.

• **Memory Transfer** LED — Located inside the cabinet in the center of the main board. Serves as a diagnostic aid by flashing as data is transferred to and from the Memory Module.

Grounding instructions

System grounding (supplemental ground) is as follows:

- The conductor wires can be no smaller than the ungrounded branch-circuit supply conductors (usually 16-gauge or larger).
- Acceptable wire: bare **or** covered with green (or green-and-yellow-striped) jacket.
- Conductors (and power receptacles) shall connect to earth ground at the service equipment (usually a cold water pipe or copper ground rod).
- The supplemental ground must: be used regardless of power cord ground, be connected to the ground lug on the bottom of the IVX cabinet, and retain ground connection when IVX power supply module is unplugged.

> **Note:**   IVX S-Class system lines are protected against a 10 KV surge **only** if the earth ground procedures described above are followed.

Power

The system cabinet requires a 120 VAC outlet (if possible, a dedicated outlet). Use **only** the Class-2 power supply module provided. A clean, isolated power source in conjunction with a UPS (see "UPS," *below*) is **STRONGLY** recommended. The system draws a maximum of 50 watts.

If AC power is interrupted, the system will drop all connections. When power is restored, the system will resume normal operation in approximately one minute, having retained its full programming and clock setting.

UPS

For system protection and to maintain uninterrupted operation, an uninterruptible power supply (UPS, or "battery back-up") is **STRONGLY** recommended. A UPS rated for 200 VA will provide approximately two hours of uninterrupted service for an IVX S-Class system.

> **Note:**   The remaining information under "UPS" comes from *Technical Update* #216.

Most people have heard about UPSs, but seem to think that there is just one kind of device that goes by that name. In fact, there are several different major designs in use by today's major UPS manufacturers. These makers share much of the blame for confusing UPSs' end users by, far too often, lumping different designs under the "UPS" name.

UPSs can first be broken down into **system types**:

- **Stand-by** — A very simple design that affects power only when either a lag/brownout occurs below, or a spike/surge occurs above, a certain threshold. When either occurs, the unit trips — *i.e*., goes into battery mode. This "cleans" the voltage and helps to keep any load safe. Industry average "trip" times are 2–8 ms. No other filtration of AC power is performed.
- **Line interactive** — Constantly monitors inbound voltages, and uses special circuitry to boost low voltages and clamp high voltages without having to use the batteries. Indeed, the batteries are used only if the input voltage drops below acceptable levels (typically about 12% below normal), goes out completely or rises to dangerous levels (typically about 14% above normal) at which components will be damaged if line voltage is not removed. Industry average transfer time is 1–3 ms. (If voltage stays within its normal window, this unit continues to pass voltage, unaltered, from the wall.)
- **On-line** (or *full on-line*) — Constantly filters the power and performs a function known as double conversion (AC to DC to AC). This assures that the load — in this case, phone equipment — will receive not only uninterrupted, true sine wave output but also the cleanest, steadiest power possible throughout any foreseeable power disruptions or voltage irregularities. According to industry specs, it

is not unusual for these types of units to be able to regulate utility power, even when it drops to 27% below or rises to 33% above normal, all without using their batteries.

From this point, UPSs can be further broken down by inverter types, which determine output. These are:

• **Square wave**.

• **Modified sine wave** (or *quasi sine wave*).

• **Sine wave**.

Most devices with wall-mounted chargers, such as cordless drills or screwdrivers, can behave erratically — sometimes not allowing the charge circuit to engage at all — when operating with modified sine or square wave inverters. Small wall-based transformer-style power supplies, similar to those ESI phone systems use, can experience overheating problems with modified sine or square wave outputs, which occur while some UPSs are operating in battery mode. This overheating could eventually cause damage to the power supplies; and, in time, the damage could cause a spike through the phone system — seriously damaging some of the static-sensitive components inside the casing.

While the **true** sine wave UPS output power curve smoothly increases to its peak, then smoothly decreases (allowing connected loads and equipment to operate the same as they would from utility supplied wall power), the **modified** sine wave and square wave UPS output power curve will shoot straight up, level off at peak voltage and then drop straight down. Additionally troublesome is that the modified sine wave sits at zero voltage for a short period during the transition to or from batteries — which is the main difference between it and the square wave output of some UPS. Please note that this short interval during which the modified sine wave UPS sits at zero voltage can directly affect the transfer time of the UPS and could, theoretically, be enough to cause the phone equipment to reset or even "freeze."

Though it is hard to predict exactly when different ESI systems will have problems with modified sine wave or square waveform UPSs (meaning during a power failure event or the recovery from one), it's fair to assume that a problem will eventually arise from the use of such UPSs. **Therefore, ESI recommends that only true sine wave output UPSs provide backup power to our phone systems and equipment.**

MOH port

The MOH (messages-on-hold or music-on-hold) connector on the upper right side of the cabinet is a standard $^1/_8''$ monophonic mini-jack for playing live music-on-hold from an external source such as a radio or CD player.

Serial ports for maintenance and SMDR

There are two ports on the side of the cabinet:

- A DB9 serial connector for maintenance and SMDR
- A USB connector[1] for maintenance.

For printer-to-computer connection, use a standard shielded serial cable appropriate to the connector you choose. (With the DB9, the cable should be DB9-to-DB9, usually male-to-female.)

> **Note:** The maximum distance from the cabinet is 100 ft.

The output from each port is 8 data bits, 1 stop bit, and no parity. The pinout is:

Data Transmit	Pin 2
Receive	Pin 3
Ground	Pin 5

Range: Programmable for 300, 1,200, 2,400, 4,800, 9,600, 19.2K, 38.4K, or (Generation II only) 115K bps. **Default:** 38.4K.

Maintenance

You can connect a PC (such as a laptop) to the port to perform on-line programming and diagnostics.

SMDR

IVX S-Class continuously outputs real-time SMDR call records to the port.

> **Note:** The system will buffer up to 1000 SMDR records (80 KB) in non-volatile memory (CompactFlash) when the maintenance port is in use for programming or uploading. When the buffer reaches capacity, the oldest records are discarded.

External paging device connection

A dry contact overhead-paging device can be connected to the system through the port card's 66 block. The overhead paging port is fixed (located on the main board) as extension 199 for programming purposes and user access.

Audio connection

The audio pair is connected to the 66 block at terminal 33 and 34. The pair's impedance is 600 ohms.

Dry contact control

The manner in which the dry contact pair is punched down on the 66 block sets the pair as normally open (sending a page to the port will close the contacts) or normally closed (sending a page to the port will open the contacts). Connect the dry contact pair of the device to IVX as follows:

- Terminals 35 and **36** to provide normally **open** operation
  or
- Terminals 37 and **38** to provide normally **closed** operation.

> **Note:** The port doesn't support talk-back paging (which requires a CO port), nor does it support CO ring through the port.

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[1] USB will be functional in a future software release.

Amphenol cable connections

Connect a standard 66 Block using a male 50-pin amphenol cable to the port card's female connector located on the bottom-right side of the cabinet. The connector closest to the wall is the first port card (which is the main board on the S-Class).

CO line connection

Local loop

IVX S-Class's advanced CO line circuitry provides for open loop detection and the system's built-in Caller ID interface.

> **Note:** Observe correct order of connection to preserve proper rotary hunting of the CO lines.

Station connection

The first eight pairs on the amphenol are station ports.

All stations are connected using a single pair. Each port position is pre-numbered and fixed as indicated in the 66 Block Wiring Diagram.

> **Note:** The station runs can be up to 1,000 ft.

Digital stations

The digital station wiring is not polarity-sensitive. Only one phone can be connected per digital port.

Analog ports

The analog ports do not require that tip-and-ring polarity be observed. The analog ports can be used for 2500 type sets or for devices such as fax machines, cordless phones, etc., that can be connected via a normal tip-and-ring pair. Each analog port will support only a single analog device.

Station Numbering Plan

Each port card has 10 station interfaces.

Generation II				Generation I		
Port card	Digital stations	Analog stations		Port card	Digital stations	Analog stations
1	100 through 107	132 and 133		1	100 through 107	124 and 125
2	108 through 115	134 and 135		2	108 through 115	126 and 127
3	116 through 123	136 and 137		3	116 through 123	128 and 129
4	124 through 131	138 and 139				

Installing the TAPI Phone

Important:	To install the TAPI drivers to a PC with *Windows NT* 4.0 where Service Pack 3 (or greater) hasn't been installed, please obtain the latest Service Pack — currently, Service Pack 6a, or "SP6a" — from the following link and install it before continuing: *http://www.microsoft.com/ntserver/nts/downloads/recommended/SP6 /*

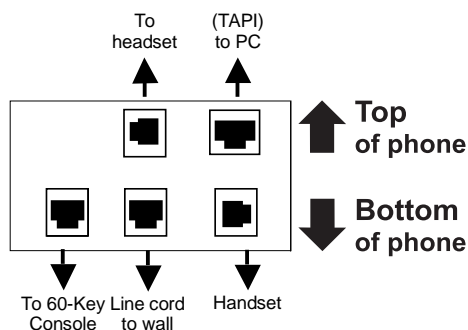## *Requirements*

To perform this installation, you will need:

• A TAPI Phone (48-Key Digital Feature Phone with TAPI interface).

• A PC that's running *Windows 95, 98, ME, NT, 2000* or *XP* and has an unused COM (serial) port.

• TAPI cable and adapter (shipped with each TAPI Phone).[1]

Also, if Caller ID integration is desired, you should confirm that (a) Caller ID is enabled on the IVX S-Class phone system and (b) the telephone company is providing Caller ID service.

Procedure

Note: If using the Technical Resource Guide CD-ROM, proceed to Step 1. Otherwise, skip to Step 2.

1. Insert the CD-ROM into the PC's CD-ROM drive; then browse to the CD-ROM drive and locate the *Esiivx.exe* file. (Depending on your settings, the file may appear as just *Esiivx.*[2]) **Skip to Step 5.**

2. Use your Web browser to reach *http://www.esiresellers.com/software.html*. (You'll need your ESI Resellers' site password, which is different from your Tech Support password.)

3. To download the software, scroll to and then click on the link to the *TAPI 2000* software listed as *"IVX TAPI Phones, both current and legacy."*

4. When prompted, select a folder in which to save the software. (We suggest *C:\Windows\Temp.*)

5. The software is a self-extracting installer. To launch the installation process, browse to the *Esiivx.exe* file and double-click on it.

6. If asked whether you wish to continue, click on **Yes**. Then, follow the instructions that appear.

7. At the end of the installation, you'll be prompted whether you wish to restart the PC. Click on **Finish**.

8. As the PC restarts, a window will appear asking you to select the COM (serial) port that will be used for TAPI activity. Select the appropriate port and click on **OK**.

9. Connect one end of the provided serial cable to the PC serial port selected in Step 8. Connect the other end to the bottom of the TAPI Phone (see diagram, *right*).

*Connectors on bottom of TAPI Phone (Headset jack shown is **only** on 48-Key Feature Phones shipped after March 1, 2004)*

You have now successfully installed the *TAPI 2000 Windows* telephony driver. Continue to the next page to test the operation of the TAPI interface.

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[1] If the PC has a 25-pin serial connector, you'll need to obtain a DB9-male-to-DB25-female adapter (such as Radio Shack® model # 26-287).

[2] We suggest that you change your *Windows Explorer* settings so that the extension always appears in file listings. Here's how:
    a. In *Windows Explorer*, click on the **View** menu and select **Folder Options**.
    b. In the **Folder Options** window, click on the **View** tab.
    c. Locate the item entitled *Hide extensions for known file types*.
    d. Make sure that this item **isn't** checked; if it is, **un**check it.
    e. Click on **OK** to finish.

Testing TAPI

Windows includes a simple TAPI application, *Phone Dialer,* which can be used to test the TAPI interface by dialing a phone number. Two versions of *Phone Dialer* are currently available. Depending on which version of *Windows* you have, follow the appropriate test procedure for the *Phone Dialer* software on your PC.

Testing with Phone Dialer (Windows 95/98/ME)

1. Click on the *Windows* **Start** button; then click on **Run**, type *Dialer* in the Run window and click on **OK**. This will start the file *Dialer.exe*.
2. In the *Phone Dialer* window, click on the **Tools** menu; then click on **Connect Using...**
3. In the **Line** field, select *ESI IVX Telephony Service Provider* and click on **OK**.
4. Once again, click on **Tools**; then click on **Dialing Properties...**
5. Enter the local area code and the appropriate access codes for an outside line; to insert a pause, use a comma (*e.g.*, for local calls, you might use **9,**).
6. Make sure the **To disable call waiting, dial:** box is **not** checked. Then, click on OK.
7. In the *Phone Dialer* window, enter the number to dial and click on **Dial**.
8. If the TAPI installation was successful, the phone's **SPEAKER** key will light up and you'll hear the phone number being dialed. If the call can't be completed, add one or more commas to the outside access codes; also, verify that the other dialing properties are correct for the area from which you're calling.

Testing with Phone Dialer 1.0 (Windows NT/2000/XP)

1. Click on the *Windows* **Start** button; then click on **Run**, type *Dialer* in the Run window and click on **OK**. This will start the file *Dialer.exe*.
2. In the *Phone Dialer* window, click on the **Edit** menu; then click on **Options**.
3. In the **Options** window, click on **Phone and Modems Option**.
4. In the **Phone and Modems** window, a location entry should be highlighted. Click on **Edit**.
5. In the **Edit Locations** window, enter the local area code and the appropriate access codes for an outside line; to insert a pause, use a comma (*e.g.*, for local calls, you might use **9,**).
6. Make sure the **To disable call waiting, dial:** box is **not** checked. Then, click on OK.
7. In the **Phone and Modem Options** window, click on **OK**.
8. In the **Options** window, under **Line Used For...**, select *ESI IVX Telephony Service Provider* and click on **OK**.
9. In the *Phone Dialer* window, click on **Dial** and enter the number to dial in the **Dial** window. Then, click on the **Phone Call** radio button, followed by the **Place Call** button.
10. If the TAPI installation was successful, the phone's **SPEAKER** key will light up and you'll hear the phone number being dialed. If the call can't be completed, add one or more commas to the outside access codes; also, verify that the other dialing properties are correct for the area from which you're calling.

Proceeding to use TAPI

The TAPI interface is now ready to be integrated with the user's preferred TAPI-enabled application. For instructions on connecting to the TAPI driver, refer to the documentation for that application.

60 Key Expansion Console connection

> **Note:** The 60-Key Expansion Console can be connected to only a 48-Key Digital Feature Phone.

1. The 60-Key Expansion Console includes an **expansion cable**. Connect one end of the expansion cable to the appropriate connector on the bottom of the Feature Phone (see diagram, *right*). Then, connect the other end of the expansion cable to the 60-Key Expansion Console.

2. To keep cabling out of the way, thread the expansion cable into the slots on the bottom of the phone and 60-Key Expansion Console.

3. Program the keys on the 60-Key Expansion Console using the same procedure as with the Digital Feature Phone (press **PROGRAM 2**).

4. If necessary, remove the clear **plastic** overlay from the keys on the Expansion Console.

Connectors on bottom of TAPI Phone
*(Headset jack shown is **only** on 48-Key Feature Phones shipped after March 1, 2004)*

5. For the customer's convenience, label the **paper** overlay to show how the keys are programmed (we suggest you use the *Esi-Access* PC software application for this).

6. Install the labeled **paper** overlay on the 60-Key Expansion Console.

7. Install the clear **plastic** overlay **over** the paper overlay, to protect it.

8. Use the provided Velcro® tape to attach the left side of the 60-Key Expansion Console to the right side of the IVX Digital Feature Phone.
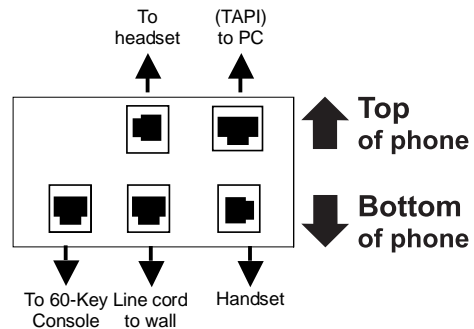
482 port card (Generation II or Generation I)

Term	Wire color	Signal	RJ11	Port
1	White-Blue	Data+	Green	Digital
2	Blue-White	Data-	Red	
3	White-Orange	Data+	Green	Digital
4	Orange-White	Data-	Red	
5	White-Green	Data+	Green	Digital
6	Green-White	Data-	Red	
7	White-Brown	Data+	Green	Digital
8	Brown-White	Data-	Red	
9	White-Slate	Data+	Green	Digital
10	Slate-White	Data-	Red	
11	Red-Blue	Data+	Green	Digital
12	Blue-Red	Data-	Red	
13	Red-Orange	Data+	Green	Digital
14	Orange-Red	Data-	Red	
15	Red-Green	Data+	Green	Digital
16	Green-Red	Data-	Red	
17	Red-Brown			
18	Brown-Red			
19	Red-Slate			
20	Slate-Red			
21	Black-Blue			
22	Blue-Black			
23	Black-Orange			
24	Orange-Black			
25	Black-Green	Tip	Green	Analog
26	Green-Black	Ring	Red	
27	Black-Brown	Tip	Green	Analog
28	Brown-Black	Ring	Red	
29	Black-Slate			
30	Slate-Black			
31	Yellow-Blue			
32	Blue-Yellow			
33	Yellow-Orange			
34	Orange-Yellow			
35	Yellow-Green			
36	Green-Yellow			
37	Yellow-Brown			
38	Brown-Yellow			
39	Yellow-Slate	Tip	Green	CO
40	Slate-Yellow	Ring	Red	
41	Violet-Blue	Tip	Green	CO
42	Blue-Violet	Ring	Red	
43	Violet-Orange	Tip	Green	CO
44	Orange-Violet	Ring	Red	
45	Violet-Green	Tip	Green	CO
46	Green-Violet	Ring	Red	
47	Violet-Brown			
48	Brown-Violet			
49	Violet-Slate			
50	Slate-Violet			

Worksheet (Generation II)

Term.	Wire color	Signal	RJ11	IVX 56s Base Cabinet		Expansion Cabinet	
				Main Bd./ Pt. Cd. 1	Pt. Cd. 2	Pt. Cd. 3	Pt. Cd. 4
1	White-Blue	Data+	Green	Digital 100	Digital 108	Digital 116	Digital 124
2	Blue-White	Data-	Red				
3	White-Orange	Data+	Green	Digital 101	Digital 109	Digital 117	Digital 125
4	Orange-White	Data-	Red				
5	White-Green	Data+	Green	Digital 102	Digital 110	Digital 118	Digital 126
6	Green-White	Data-	Red				
7	White-Brown	Data+	Green	Digital 103	Digital 111	Digital 119	Digital 127
8	Brown-White	Data-	Red				
9	White-Slate	Data+	Green	Digital 104	Digital 112	Digital 120	Digital 128
10	Slate-White	Data-	Red				
11	Red-Blue	Data+	Green	Digital 105	Digital 113	Digital 121	Digital 129
12	Blue-Red	Data-	Red				
13	Red-Orange	Data+	Green	Digital 106	Digital 114	Digital 122	Digital 130
14	Orange-Red	Data-	Red				
15	Red-Green	Data+	Green	Digital 107	Digital 115	Digital 123	Digital 131
16	Green_Red	Data-	Red				
17	Red-Brown						
18	Brown-Red						
19	Red-Slate						
20	Slate-Red						
21	Black-Blue						
22	Blue-Black						
23	Black-Orange						
24	Orange-Black						
25	Black-Green	Data+/Tip	Green	Analog 132	Analog 134	Analog 136	Analog 138
26	Green-Black	Data-/Ring	Red				
27	Black-Brown	Data+/Tip	Green	Analog 133	Analog 135	Analog 137	Analog 139
28	Brown-Black	Data-/Ring	Red				
29	Black-Slate						
30	Slate-Black						
31	Yellow-Blue						
32	Blue-Yellow						
33	Yellow-Orange	OH Page Audio A					
34	Orange-Yellow	OH Page Audio B					
35	Yellow-Green	OH Page Relay Common					
36	Green-Yellow	Relay Normally Open **or** Relay Normally Closed					
37	Yellow-Brown						
38	Brown-Yellow						
39	Yellow-Slate	Tip	Green	CO 1	CO 5	CO 9	CO 13
40	Slate-Yellow	Ring	Red				
41	Violet-Blue	Tip	Green	CO 2	CO 6	CO 10	CO 14
42	Blue-Violet	Ring	Red				
43	Violet-Orange	Tip	Green	CO 3	CO 7	CO 11	CO 15
44	Orange-Violet	Ring	Red				
45	Violet-Green	Tip	Green	CO 4	CO 8	CO 12	CO 16
46	Orange-Violet	Ring	Red				
47	Violet-Brown	Tip	Green				
48	Brown-Violet	Ring	Red				
49	Violet-Slate	Tip	Green				
50	Slate-Violet	Ring	Red				

Worksheet (Generation I)

Term.	Wire color	Signal	RJ11	IVX 42s Base Cabinet Pt. Crd. 1	Pt. Crd. 2	Expansion Cabinet Pt. Crd. 3
1	White-Blue	Data+	Green	Digital 100	Digital 108	Digital 116
2	Blue-White	Data-	Red			
3	White-Orange	Data+	Green	Digital 101	Digital 109	Digital 117
4	Orange-White	Data-	Red			
5	White-Green	Data+	Green	Digital 102	Digital 110	Digital 118
6	Green-White	Data-	Red			
7	White-Brown	Data+	Green	Digital 103	Digital 111	Digital 119
8	Brown-White	Data-	Red			
9	White-Slate	Data+	Green	Digital 104	Digital 112	Digital 120
10	Slate-White	Data-	Red			
11	Red-Blue	Data+	Green	Digital 105	Digital 113	Digital 121
12	Blue-Red	Data-	Red			
13	Red-Orange	Data+	Green	Digital 106	Digital 114	Digital 122
14	Orange-Red	Data-	Red			
15	Red-Green	Data+	Green	Digital 107	Digital 115	Digital 123
16	Green-Red	Data-	Red			
17	Red-Brown					
18	Brown-Red					
19	Red-Slate					
20	Slate-Red					
21	Black-Blue					
22	Blue-Black					
23	Black-Orange					
24	Orange-Black					
25	Black-Green	Data+/Tip	Green	Analog 124	Analog 126	Analog 128
26	Green-Black	Data-/Ring	Red			
27	Black-Brown	Data+/Tip	Green	Analog 125	Analog 127	Analog 129
28	Brown-Black	Data-/Ring	Red			
29	Black-Slate					
30	Slate-Black					
31	Yellow-Blue					
32	Blue-Yellow					
33	Yellow-Orange		OH Page Audio A			
34	Orange-Yellow		OH Page Audio B			
35	Yellow-Green		OH Page Relay Common			
36	Green-Yellow		Relay Normally Open or			
37	Yellow-Brown		Relay Normally Closed			
38	Brown-Yellow					
39	Yellow-Slate	Tip	Green	CO	CO	CO
40	Slate-Yellow	Ring	Red			
41	Violet-Blue	Tip	Green	CO	CO	CO
42	Blue-Violet	Ring	Red			
43	Violet-Orange	Tip	Green	CO	CO	CO
44	Orange-Violet	Ring	Red			
45	Violet-Green	Tip	Green	CO	CO	CO
46	Green-Violet	Ring	Red			
47	Violet-Brown	Tip	Green			
48	Brown-Violet	Ring	Red			
49	Violet-Slate	Tip	Green			
50	Slate-Violet	Ring	Red			

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Remote maintenance with *Esi-Access*

Esi-Access, one of the five modules of *Esi-Tools*, gives the **Installer** the capability to program all phone system features, including IP addresses for Remote Phones and Esi-Link. *Esi-Access* can be used from a PC or laptop connected directly to the phone system on-site; it can also connect to the system remotely via TCP/IP or dialup. *Esi-Access* can be used remotely by the Installer to make adjustments to a site's phone system. This section will cover how to use *Esi-Access* in conjunction with the phone system's NSP for remote maintenance.

Required equipment and information:

- An NSP installed in the site's ESI phone system.
- You will also need to know the site's NSP IP address _____.
- The PC or laptop must have an Ethernet interface and have a broadband connection to the LAN, WAN, or Internet (depending upon the type of remote connection involved).
- TCP/IP port number **59002** for the site's router.

Esi-Access setup

1. Contact the site to port-forward TCP/IP port 59002 from the router to the NSP's IP address. Verify that the port prefix of *59* hasn't changed (if it changed to *56*, for example, the port number would be *56002* rather than *59002*). If the customers are unaware how to port-forward, have them refer to the router's *User's Guide*.

   > **Note:** For an explanation of how the port forwarding works, see "*Configuring the remote office NAT router*" in *NSP/VIP Advanced Options Guide* (ESI part #0450-0667).

2. After port forwarding is complete, install *Esi-Access* on your PC. *Esi-Access* can be found on the *Technical Resource* CD or on the Resellers' Web site, *www.esiresellers.com*.
3. Follow directions in the *Esi-Tools User's Guide* (# 0450-0311) for setting up a site.

Connecting to the site

> **Important:** ESI **strongly** recommends connecting to the phone system via the NSP, for a faster and more stable connection.

Once the site is created, connect to the site using network communications, as follows:

1. Highlight the site and click **Program**.
2. For **Access Mode**, select **Online**.
3. For **Communications Type**, select **Network.** Two fields will now appear:
   a. **IP Address** —
      This will be the site's NSP IP address.
   b. **Port Number** —
      This typically will be *59002* unless the prefix, *59*, was changed.
4. Click **OK** to connect.

Once you are connected to the site, you can program features as if you were actually there.

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System programming: An introduction

You can program an IVX S-Class system either (a.) from a 24 or 48-Key Digital Feature Phone in the system (while the system is operating) or (b.) with the *Windows*®-based *Esi-Access* package. Both methods follow the same programming steps. This manual focuses on programming from a Digital Feature Phone; the respective documentation for *Esi-Access* details the differences in programming from that environment.

Read the *User's Guide* first. Programming features require a clear understanding of **user** interface and application.

Once you've accessed programming mode on a 24-Key or 48-Key Digital Feature Phone, the system will prompt for — and confirm — each keystroke action via voice commands and the display. You program both configuration data and recordings in the same manner.

> **Important:**   During programming, the 24-Key Feature Phone's two-line display shares the same content as the top two lines of the 48-Key Feature Phone's three-line display. As a result, to save space, the sample displays shown herein will show only two lines.

Programming keys

During programming, the first line of the display will show the current **item** being programmed, and the second line will be the **entry** line. You can enter values as directed by the combination of the voice prompts and display. To enter multiple values, such as a list of extension numbers, separate each value by **#** (to exit the list, enter **# #**).

To...	Press ...	What this does
Enter	#	Confirms new or existing entry and advances to next programming step.
Back up (*i.e.*, reverse direction)	✱	Backs up to previous prompt without changing its value.
Delete	**HOLD**	Deletes data or recording.
Exit	[Hang up]	Exits programming mode and removes extension from DND.
Help	**HELP**	Provides more detailed instructions during programming.
Select/scroll	*(left-side scroll key)*	• During entry of a value, backs up. • If a list is present (">" is displayed), scrolls to left.
	(right-side scroll key)	• Selects from options presented. • If a list is present (">" is displayed), scrolls to right. • Inserts a space during entry of a name.

> **Note:**   Either **<** or **>** in the display indicates that additional choices or values are available by pressing a corresponding scroll key (or   ).

Entering alphanumeric characters

You enter names for **extensions and departments** by pressing the dial pad key that corresponds to the character to be entered. The key's possible entries will change each time the key is pressed, and the display will show this. When the desired character appears on the display, press **#** to confirm; the cursor will move to the next character position. You may move the cursor left (to correct an entry) by pressing the left scroll key ( ) or move right (to add a space) by pressing the right scroll key ( ).

Key	Options		Key	Options
0	0, - (hyphen), _ (underline)		7	P, R, S, 7
1	Q, Z, 1, "_" (space)		8	T, U, V, 8
2	A, B, C, 2		9	W, X, Y, 9
3	D, E, F, 3		(left scroll key)	Backs up and erases
4	G, H, I, 4		(right scroll key)	Adds a space
5	J, K, L, 5		**#**	[Enter]
6	M, N, O, 6		**# #**	Ends the name

Example: To enter a *B*, press **2** twice (the possible options to scroll through are **A, B, C** and **2**). When **B** is displayed, press **#** to confirm; the cursor will move to the next character to be entered. To complete the name, press **# #**.

System fixed numbering plan

Numbers		Function
Generation II	Generation I	
0	0	Operator
1–16	1–16	CO lines
100–131	100–123	Digital extensions
132–139	124–129	Analog extensions
199	199	Overhead paging port
290–299		Department numbers
300–309		Guest/info mailboxes
500		Broadcast mailbox
520–529		Cascade mailboxes
560–580		Feature codes
590–594		MOH recordings
600–699		System speed-dial

System programming overview

Programming menu for S-Class with Integrated Answering Machine

1 System parameters
   11 Initialize
   12 Installer password
   13 Administrator password
   14 System clock
       141 Set time/date
       142 Automatic time setting
   15 System timing parameters
       151 Flash duration
       152 Transfer forward timer
       153 Recall timers
   16 System feature parameters
       162 Connect tone
       163 Feature set activation *(Generation II only)*
   17 System speed dial
   18 **Maintenance/SMDR** serial port baud rate

2 CO line programming
   21 Line programming
   22 Translation Table Programming
       221 Centrex/PBX access code
       222 Toll restriction exception tables
   23 Line parameters
       231 Line receive volume
       232 Analog line disconnect
   24 Caller ID programming

3 Extension programming
   31 Extension definition and routing
   32 Extension feature authorization
   33 Department programming
   35 Extension button mapping

5 Voice mail programming
   54 Answering Machine Member
   55 Message notification options

6 Recording
   63 MOH programming
       631 MOH source

Entering programming mode

You may program from **any** 24-Key or 48-Key Digital Feature Phone[1] in the system:

1. Press **PROGRAM**[2] at any digital station. The normal **station** programming menu prompts will begin to play.

2. Press **HOLD**. The "enter password" prompt will play.

3. Enter the **Installer password** (default is **7 8 9**).[3] Then, to confirm the password, either press **#** or wait two seconds. **You are now in programming mode.** The extension will be automatically placed in DND, and its display will show:

```
INSTALLER
CMD:
```

4. The system will play the **system** programming menu. Follow it to program as you wish.

5. When finished, hang up.

> **Note:** The system will automatically exit programming mode after 10 minutes of inactivity.

> **Example:** If your Installer password is *864*, **enter** programming mode by pressing **PROGRAM HOLD 8 6 4 #**. (To **exit** programming mode, hang up.)

---

[1] Although a 12-Key Feature Phone allows you to **enter** Installer and Administrator programming, we don't recommend that you use a 12-Key Feature Phone for programming because of its one-line display and small number of programmable feature keys.
[2] Or, if using the 24-Key Feature Phone, press **PROG/HELP**.
[3] If you prefer to enter Administrator programming mode, use the Administrator password, instead (the default is **4 5 6**).

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Function 1: System parameters

Function 11: Initialize

This function will return all components and software to their initial state. Initialization will erase all data and custom recordings.

Important notes:	Always initialize the system before initial programming for a new installation. You must confirm the command to initialize, when prompted, by entering the Installer password. Be sure to set the time and date (Function 14) before initializing.

System initialization will approximately one minute to complete. When completed, the phone's display will return to the idle state. **You must then re-access Programming Mode** by following the steps described earlier (see page D.3).

Functions 12 and 13: Installer and Administrator passwords

These functions will display the existing password and prompt for entry of a new password. The passwords can be 2–8 digits long, followed by **#**. **The Installer can change either the Installer or Administrator Password. Only those functions listed in the** *Administrator manual* **can be programmed via the Administrator Password.** The default passwords are:

Installer Password (Function 12)   =   **7 8 9**

Administrator Password (Function 13)   =   **4 5 6**

Notes:	Be sure to write down the new passwords, store them in a safe place and give the new Administrator's Password to the Administrator.

Accessing user station programming

Should a user forget his password or if an employee leaves the organization, this feature allows the Installer or Administrator to enter a user's station programming and operate within it as if he were the user. From the user's station, enter the **Installer** or **Administrator** password when the system prompts for the **user** password.

Example:	From station 105, entering **7 8 9 #** or **4 5 6 #** instead of the user password (**1 0 5 #**) will enter the station's user programming. (Default passwords shown for this example).

Function 14: System clock

Function 141: Set time/date

1. Enter a new time in a **twelve**-hour format.

> **Example:** Enter **1 2 3 3** for *12:33*, or **3 1 5** for *3:15* (note that you need **no** leading zero for the time).

2. Select AM or PM by pressing a scroll key (either or).

3. Enter a new date in an **eight-digit** format, **including** leading zeroes.

> **Example:** Enter **0 7 0 4 2 0 0 3** for July 4, 2003 (note that leading zeroes **are** required here, unlike in Step 1).

4. Press **#** to finish the entry.

> **Note:** A built-in battery maintains the correct time and date, even in the event of a power loss.

Function 142: Automatic time setting

1. Synchronize with CID

This function, when enabled, synchronizes the real-time clock with Caller ID (CID) messaging: call processing compares the time of a CID message to the system real-time clock and, if the difference is more than two minutes, resets the real-time clock to match the time (hours and minutes) of the CID message. The system will analyze each such message (or — if it receives more than four calls with CID information within a one-minute period — as is needed). Select *ENABLE* or *DISABLE* by pressing a scroll key (either or). Choosing *ENABLE* will allow the CID data to update the time and date.
Default: Enabled.

2. Adjust for Daylight Savings Time

This function, when enabled, causes the real-time clock to adjust itself automatically for Daylight Savings Time (DST). Select *AUTO* or *DISABLE* for DST by pressing a scroll key (either or). Choosing *DISABLE* is best for those areas that don't observe DST.
Default: Disabled.

Function 15: System timing parameters

Function 151: Flash hook duration

This sets the time (in seconds) that a flash hook will be sent on the current line to the Telco. The default setting of **1.5** will cause disconnect and fresh dial tone from the CO.
Range: 0.2–2.0. **Default:** 1.5.

Function 152: Transfer forward timer

This sets the number of times a transferred call will ring before following the day/night routing for the extension or department.
Range: 1–9 rings. **Default:** 3.

Function 153: Recall timers

Function 1531: Exclusive hold recall timer

This is the amount of time, in seconds, that a call will remain on exclusive hold before recalling to the extension that initiated the exclusive hold.
Range: 5–960 seconds. **Default:** 60.

Function 1532: Hold recall timer

This is the amount of time, in seconds, that a call will remain on hold before recalling to the extension that initiated the hold.
Range: 5–960 seconds. **Default:** 60.

Function 16: System feature parameters

Function 162: Connect tone

This sets whether the system plays a system connect tone (two short beeps a user hears when a station answers).
Default: Enabled (the beep plays).

Function 163: Feature set activation

Field 1: Group listen

With this feature **disabled**: if a station user presses **SPEAKER** while on a call, the Feature Phone immediately turns off the handset and switches to hands-free mode. If enabled, the group listen feature is available system-wide. If disabled, it is no longer available.
Default: Disabled.

Field 2: Privacy release

With this feature **enabled**: if a station user presses a CO line key that is in use (lit red), the user will be immediately conferenced with the call in progress on that line. With this feature **disabled**, pressing an in-use CO line key has no effect.
Default: Disabled.

Field 3: Headset microphone gain adjust

(Generation II only.) Adjusts the gain of headset microphones connected either directly to a 48-Key Feature Phone's headset jack or a headset box connected to a 24-Key Feature Phone.

(Continued)

If the headset microphone gain is too high ("hot"), the user may perceive an annoyingly loud sidetone or hissing when on a station-to-CO call. The default level should provide a comfortable sidetone level and adequate transmit volume when used with recommended headsets. **Range:** 0–5. **Default:** 2. (See table, *below.*)

Entry	Value		Entry	Value
5	+9dB		2	0dB *(default)*
4	+6dB		1	-3dB
3	+3dB		0	-6dB

> **Warning:** Changing the headset microphone gain will drop all calls in progress. **Before** making any changes to this parameter, make sure that all stations are idle.

Function 17: System speed-dial

Up to 100 system speed dial names and associated numbers can be stored, in location numbers 600–699, for access by any station. A user can initiate a system speed-dial by dialing the speed dial location number or by accessing the name through the Esi-Dex feature. In Function 32, access to system speed-dial can be denied to individual stations (see page G.4).

> **Note:** System speed-dialing overrides toll restrictions (Function 32, page G.4).

1. Enter the 3-digit location number to program.

2. Enter a **ten-character** name (see "Entering alphanumeric characters," page D.2).

> **Note:** You must enter a name to continue.

3. Enter the number to be dialed (including the line group 9, 8, or 7). Press the left scroll key ( ) to delete any character or digit entered in error. Here's an example:

1.	2.	3.
Speed Dial #	**Name**	**Number**
601	AUTO RENTL	915552221212

The number dialed in Step 3 can be up to 30 digits long **including** the following special codes:

Code	What it produces
#	# DTMF tone
✶	✶ DTMF tone
F	Flash hook
P	2-second pause

To insert a special code, press the right scroll key ( ) to select the desired special code: **#** , ✶ , **F** or **P**.

Press **#** to confirm the inserted character and continue. Press **# #** to complete the entry.

Use the down arrow key ( ) to backspace. Once the number is saved you can use the scroll keys to move back and forth to view the number. To edit the number, you must delete it and enter the correct number.

> **Example:** To create a System Speed Dial number that dials *9*, then *972-555-5644*, then pauses for four seconds and finally dials *#104*, enter:
>
> **9 9 7 2 5 5 5 5 6 4 4** (then scroll to) **P #** (then scroll to) **P #** (then scroll to) **# # 1 0 4** #

Deleting a speed dial number

To delete an entire speed dial number and name, delete the location number (**6 X X**) by pressing **HOLD** or the left scroll key ( ) during Step 1 in the speed-dialing procedure described above.

Function 18: Maintenance/SMDR serial port baud rate

The RS-232C serial port (DB9) on the system cabinet provides not only SMDR data but also access to system maintenance.

> **Note:** The system will buffer up to 1,000 SMDR records (*i.e.*, 80 KB worth) in non-volatile memory when the RS-232C serial port is in use for programming or uploading (such as during use of *Esi-Access*). If the buffer becomes full, the system will discard the oldest records.

SMDR

Real-time SMDR call records are continuously output to the SMDR (DB9) port.

1. The system will prompt you for the *baud rate.* You can change this rate by pressing the scroll keys (▼ and ▲).
   Options: 300, 1,200, 2,400, 4,800, 9,600, 19.2K, 38.4K, or (Generation II only) 115K (bps).
   Default: 38400.
2. Select the SMDR format, *STANDARD* or *CSV*, by pressing the scroll keys (▼ and ▲).
   Default: *STANDARD*.

Maintenance

A laptop PC can be connected to this port for on-line programming (using *Esi-Access*) and software upgrades. Baud rate settings for Maintenance mode are the same as for SMDR (see "SMDR," *above*).

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Function 2: CO lines

IVX S-Class can operate on a station-by-station basis as a PBX or as a combined key/PBX using standard loop start lines. If a station has line keys programmed, the user accesses the lines by pressing one of these keys **or** by dialing **9** (or **8** or **7**). If a station does **not** have line keys programmed, the user **always** accesses CO lines by dialing **9** (or **8** or **7**).

> **Note:** To provide additional visual indication of CO line usage, the 24 or 48-Key Digital Feature Phone's idle display will show on/off-hook line status.

Since the system handles call transfer functions efficiently, operating in the PBX mode provides more programmable feature keys for other uses and the opportunity for glare is greatly reduced.

> **Note:** All phone programmable keys default to being un-programmed (except on extension 100, where the first key defaults as a day/night key). Use *extension button mapping* (Function 35; see page G.6) to assign line keys system-wide. An **individual** station's keys can be reassigned using **PROGRAM 2** at that station.

> **Important:** Where any **gray shading** (▪) appears in an example, it represents values either **unavailable** to the function or **unused** in the particular example.

Function 21: CO line programming

• The CO lines are numbered either 1–16 (Generation II) or 1–12 (Generation I).

• All CO lines are programmed to route callers during the day mode and then can be programmed to route callers differently during the night mode. The display will indicate *D* (for *day*) or *N* (for *night*) to show which mode is currently being programmed. Lines that are to be programmed alike can be *grouped* to simplify programming.

> **Example:** Here is a completed Programming Worksheet for incoming calls on Line 1 to ring live to extension 100 but finally answered by the Integrated Answering Machine after 3 rings. **(The step numbers correspond to the explanation that begins following this example.)**
>
> | 1.
CO | 2.
Out | 3.
Ring 1 | Ring 3 | Ring 5 | Ring 9 |
> |---|---|---|---|---|---|
> | 1 | 9 | X100 | MB501 | | |

Do the following to program the CO lines.

1. Choose CO lines to program

During this step, you use the first 12 programmable feature keys to represent CO lines. Select lines to be programmed by pressing one or more of the programmable feature keys.

The first 12 programmable feature keys' LEDs glow red. Select the COs to program alike and press the # key to confirm. The LEDs will now glow green.

(Continued)

2. Assign outbound CO line groups

CO lines can be grouped for outbound, pooled access into one of three line groups: 9, 8, or 7.

> **Note:** A line can only be in one line group or designated as a private line.

Select the line group and press the # key to confirm. Outgoing calls will be assigned from the highest CO to the lowest available. Or, to **delete** the line group number (whereupon the line can only **receive** inbound CO line calls), press **HOLD**.

Default: 9 (i.e., all CO lines in Group 9).

Private line

You can designate a line as a **private line** by entering an extension number, instead of a line group number, in this step. The line is then programmed as outlined in the following explanation, giving the private line great flexibility for handling call routing.

> **Note:** A private line can be assigned only to a Digital Feature Phone. A line key must be programmed on the phone to access the line for outgoing calls. However, a status key can be programmed on another phone to display the busy/idle condition of a private line.

3. Assign answer rings

Lines can be directed to be answered at up to 10 extensions or departments, or the Integrated Answering Machine. The destination can be set to add or drop extensions if ringing continues due to no answer.

> **Example:** First ring — Line 1 will ring at the operator's extension.
> Third ring — Extensions 112 and 113 are added.
> Fifth ring — Extension 100 is dropped from ringing.
> Ninth ring — The call will be answered by the Integrated Answering Machine.

Day Mode

CO	Out	Ring 1	Ring 3	Ring 5	Ring 9
1	9	100	100 112 113	112 113	MB501

(Continued)

Once you have programmed all desired CO lines for day mode, repeat the programming steps for all desired CO lines for night mode. **Default:** Answer on ring 1 at extension 100 in both day and night modes.

Example: To have after hours calls directed to the Integrated Answering Machine, program the system as follows. During Night Mode, Line 1 (and other lines to be programmed alike) will be answered immediately by MB501. The Greeting for MB501 might be:

"Hello, thank you for calling ABC Company. Our offices are closed. Our normal business hours are 8 to 5 Monday through Friday. Please leave a message at the tone and your call will be returned when we resume normal business hours."

Night mode

CO	Out	Ring 1	Ring 3	Ring 5	Ring 9
1	9	MB501			

Note: CO line groups aren't programmable from night mode.

Function 22: Translation table programming

Function 221: Centrex/PBX access code

If the system is to be used behind Centrex or another PBX, you must list the **dial access code** used to gain access to a CO line from Centrex or the PBX, so that toll restriction can ignore the access code digit(s). Users must dial the access code after accessing a line by **either**:

(a.) Dialing **9**, **8**, **or 7**
or
(b.) Pressing a line key (if programmed)

The access code can be one or two digits — *e. g.,* 9, 81, *etc.* — and must be programmed for each line group.

Default: 0.

Note: You must set the flash duration in Function 151 (page E.3) for the requirements of the host switch.

Function 222: Toll restriction exception tables

The system's toll restriction is based on outbound calls being defined as either *toll calls* or *non-toll calls*.

- ∞ **Toll calls** — All "1+" or "1010" calls, information, operator, international, "1-900" and "976" calls.

- ∞ **Non-toll calls** — All seven and 10-digit local calls, and all "1-800" or "1-888" calls.

As part of extension feature authorization (Function 32; see page G.4), each station is programmed to be allowed or denied toll calls by following the fixed tables when they are programmed with an "N," as well as following the allow and deny exception tables (*i.e.*, overriding the fixed tables). All stations that have been assigned access to a line group can make non-toll calls.

To program the allow and deny exception tables:

1. Enter the numbers for either table, separating each number by **#**.

> **Example:**   For "1-900," enter **1 9 0 0 #.**

> **Note:**   Press **MUTE/DND** to insert a "wild card" digit. A "wild card" digit is needed only when followed by more numbers; *e.g.*, to allow/deny *1-555*, enter just **1 5 5 5 #** — however, to allow/deny all "1+" area codes and *555*, enter **1 X X X 5 5 5 #** (where *X* indicates a pressing of **MUTE/DND**).

> **Warning:**   Do **not** include IVX line access codes (*9, 8*, or 7) in **any** of the toll restriction entries.

2. After the last number, enter **# #** to end the list. IVX S-Class will apply the numbers you enter to their most significant digit.

> **Example:**   Entering **1 5 0 5** into the deny exception table tells IVX to deny **all** "1+" calls to area code 505. **But** entering **1 5 0 5 5 5 5 8 7 8 7** into the table tells IVX to deny "1+" calls **specifically** to (505) 555-8787 while **allowing** *other* "1+505" calls.

To allow information calls, enter into the allow table: *411, 1411, 5551212, 1XXX5551212* (where *X* is a wild card digit, entered by using **MUTE/DND**).
Default: None.

Function 23: CO line parameters

Function 231: System CO line receive volume

Many variables can affect the volume of the CO lines. Weak lines can reduce IVX S-Class's ability to properly detect DTMF dialed by an outside caller. Conversely, **"hot"** lines can cause DTMF distortion and/or increase the opportunity for message talk-off (*i. e.,* messages being cut off before completion). Ideally, a message recorded from an outside call has the same playback volume as the system prompts.

This function can be used to adjust the gain of the receive volume of the CO lines system-wide.

Range: 0–12 (lowest to highest gain, respectively).
Default: 10.

Function 232: Line disconnect / open loop interval

You can set the lines to detect the open loop interval (if available from the CO) and disconnect more quickly. This will also allow the system to:

Drop abandoned calls from hold.

Reduce the possibility that abandoned calls could create messages that are either silent or contain CO-generated tones.

Since open loop intervals generated by the CO may vary in duration, use this function to program IVX to less than or equal to the CO open loop interval.

If this programmed value is set unnecessarily low, IVX S-Class may falsely interpret static or a momentary loop break as an open loop and disconnect a caller on hold or in the process of leaving a message. If this value is set too high, IVX S-Class may not detect a valid open loop signal for fastest call processing.

Range: 1–255 (10–2,550 ms) (or **0** to turn off open loop detect).
Default: 6 (60ms).

Function 24: Caller ID

This function activates the Caller ID capability in IVX S-Class — **if** the customer has ordered Caller ID service from the Telco. IVX S-Class will display the caller's name (or "OUT-OF-AREA," etc.) for incoming calls or messages (or show the Caller ID number if the CO only provides a number).
Default: Disabled.

Esi-Dex and auto callback[1] — This is accomplished by pressing **REDIAL** or **ESI-DEX** either during message playback or after an Esi-Dex search. Caller ID numbers received from the CO are 10 digits long (and include the area codes for local calls). **In auto callback, IVX S-Class assumes all calls are to be long distance and will automatically add a "1" prefix to the 10 digits to be dialed.**

A table of local area codes can be programmed to indicate that calls to those area codes are to be dialed as local calls. Select one of the following two types of **local** dialing for each area code entered:

• **Local 7** — Local calls that can be dialed only as seven-digit numbers (IVX S-Class strips the area code before dialing and will **not** add a "1" prefix).

• **Local 10** — Local calls that can be dialed only as 10-digit numbers (IVX S-Class will **not** add a "1" prefix).

For an area code that can be called as a long distance number (with a "1" prefix) **and** as a local number (10 digits without a prefix), decide which case is the more prevalent and then add to or exclude from the area codes exception list accordingly. Thus, some of these calls must be made manually.

> **Note:** Since the Caller ID information is transmitted from the CO during the silence between the first and second rings, enabling this feature will delay the answer of inbound calls until the second ring.

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[1] Esi-Dex isn't available on the 12-Key Digital Feature Phone.

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Function 3: Extension programming

This section provides programming for extensions and department groups.

Important: Where any **gray shading** (■) appears in an example, it represents values either **unavailable** to the function or **unused** in the particular example.

Function 31: Extension definition and routing

Extensions can be either:

• **Digital Feature Phone** extensions (*DIGITAL* in the chart below and succeeding charts)

• **Analog** ports (*PHONE, FAX*, *MODEM*, *RINGER* or *DOOR* in the same charts)

Digital extensions may be either 100–131 (Generation II) or 100–123 (Generation I); analog extensions are either 132-139 (Generation II) or 124–129 (Generation I)[1]

Digital Feature Phones

Here's an example of the portion of a completed programming worksheet for Digital Feature Phones.

1. Ext.	2. Type	3. Name	4. CO	5. CF day	6. CF night	7. Page zone	8. Ext.
0		Operator		X100	X100		X100
100	DIGITAL	Jane	9	X100	MB501	0	
101	DIGITAL	Roger	9	X100	MB501	0	
102	DIGITAL	Sally	9,8	X100	MB501	0	
132	EXT	Roger 2	9	X100	MB501	0	
133	FAX	FAX					

Note: 100 defaults as OPR (when a user dials **0**); 101 is an example of system default.

Each programming step for Digital Feature Phone extensions is defined as follows:

1. **Extension number** — Extension numbers range from 100 to the highest number of ports installed and must match the port numbers as connected to the system.

2. **Type** — Based on the port card installed, IVX S-Class assigns the port as *digital.*[2]

3. **Extension name** — Used for the display, reports, and as a programming aid. The name's length can be no longer than 10 characters (See "Entering alphanumeric characters," page D.2). **Default:** The extension number.

4. **CO line group** — Assigns the extension's ability to access one **or more** CO line groups (9, 8, and 7). **Default:** 9.

5. **Call forward busy/no answer for day mode** — The extension is set to call forward busy/no answer to X100 for day mode. This option is set and cannot be changed with the exception of extension 0.

(Continued)

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[1] Extension 133 (Generation II) or 125 (Generation I) defaults as *FAX*; all other analog extensions default as *PHONE*.
[2] For programming of analog ports, see pages G.2–G.3.

6. **Call forward busy/no answer for night mode** — Same as previous item, except night mode.

> **Note:** Only extension 100 (operator) can be programmed in steps 5 and 6. Day mode is set to X100 and night mode set to MB501 (Integrated Answering Machine). If you do not want any calls for the operator to go to the Integrated Answering Machine, set the Day and Night mode to X100 and exclude MB501 from the ring assignments in Function 21. All other activated extensions automatically call forward busy/no answer to MB501. This is unchangeable.

7. **Extension page zone assignment** — The all-page zone, 0, is the only page zone available on IVX S-Class with Integrated Answering Machine. The overhead paging port (extension 199) can be paged along with other extensions in a zone by including the desired page zone for extension 199. **All** digital phone extensions are included in (and cannot be removed from) the all-page zone. **Analog extensions cannot be included in page zones.**

8. **Operator translation** — Extension **0** (Operator) programming requires:
   • Programming call forwarding for day and night mode
   • Entering the extension number to which calls are to be directed when someone dials **0**.
   Default: 100.

> **Notes:** If you want more than one extension to ring when someone dials **0**, you must build a department in Function 33 (see page G.5) and enter the department in column 8 on page G.1. If operator translation is directed to a department or branch ID, and a call to the operator is not answered, operator call forwarding takes precedence.

Analog ports

The last 2 station ports can be programmed only as shown below. This assumes a Generation II system (for Generation I, change the last two extensions below to 124 and 125, respectively).

1. Ext.	2. Type	3. Name	4. CO
0		Operator	
100	DIGITAL	Jane	9
101	DIGITAL	Roger	9
102	DIGITAL	Sally	9,8
132	PHONE / FAX / MODEM / RINGER / DOOR	PHONE / FAX / MODEM / RINGER / DOOR	9
133	PHONE / FAX / MODEM / RINGER / DOOR	PHONE / FAX / MODEM / RINGER / DOOR	9

Here are the steps for programming analog ports:

1. **Phone number** — Analog port extension numbers must be in the range of (a.) x132–x138 for Generation II or (b.) x124–x129 for Generation I.

2. **Type** — If *ANALOG PORT* is selected, then the ports can further be defined as follows; the words in parentheses **(EXAMPLE)** indicate what the display will show in each case:

> **Note:** If DTMF digits are to be received by a device connected to an analog station port (*e.g.*, IVR, paging equipment, etc.), the analog port extension type must be assigned in Function 32 as either **DOOR** or **EXT**. Any other type will block DTMF digits from passing through.

   • **Phone (EXT)** — Designed to provide for standard 2500 type phones. See *the IVX S-Class User's Guide* for complete description of the capabilities.

   • **Common ringer (RINGER)** — Connected via a tip and ring pair; will apply ring voltage whenever a line rings in night mode or when a call is directed to it (transfer, call forwarding, CO ring, etc.).

   • **Fax (FAX)** — Program a programmable feature key to an analog station (for example, 124). When receiving a call that is fax tone, simply press the programmed DSS key and hang up. If mailbox 501[1] answers the call, the system will automatically forward the tone to the analog port programmed as FAX.

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[1]   See "Function 5: Integrated Answering Machine programming," pages H.1–H.2.

- **Modem (MODEM)** — Incoming calls for a modem can be manually transferred to the modem extension; also, the modem can automatically generate outbound calls. Maximum connect speed through the PBX is 9600 bps.
- **Door phone (DOOR)** — A telephone connected to this port will automatically dial the programmed ring down extension number whenever the set is taken off-hook.

3. **Extension name** — This is used for the display, reports, and as a programming aid. The maximum length is 10 characters (See "Entering alphanumeric characters," page D.2). **Default:** The type selected.

> **Note:** The name for the ringer and door must be changed in Function 32.

4. **CO line/ring down** — For fax, modem, or phone, select the desired line group — 9, 8, or 7. **Default:** 9.
   If *door phone* is selected, an extension number is entered as a ring down destination. **Default:** Extension 100.

No dial tone is presented for *common ringer.*

Overhead paging interface

You can connect a dry-contact overhead paging device to the system through the first port card's 66 block. The overhead paging port's access is fixed as extension 199 for programming purposes. The user can access it by:

(a.) Dialing **1 9 9**

or

(b.) Programming *199* as a programmable key and/or including *199* in the page zone.

> **Note:** DTMF can be transmitted to the overhead paging port after access, allowing for zone overhead paging, if the paging unit supports zone paging.

1.				**2.**
Ext.	**Type**	**Name**	**CO**	**Page Zone**
199				0

Dry contact control

The manner in which the dry contact pair is punched down on the 66 block sets the pair as either **normally open** (sending a page to the port will close the contacts) or **normally closed** (sending a page to the port will open the contacts). See the "Hardware installation" section (beginning on page B.6).

Function 32: Extension feature authorization

The Installer or Administrator can allow or deny many extension features on an extension-by-extension basis. A User, however, can only program and use allowed features (by using a combination of voice and display prompts) from his/her phone. Here is an example of a completed programming worksheet. This assumes a Generation II system (for Generation I, change the last extension below to 124). The programming sequence is:

1. Ext.	2. Name	3. Toll allow	4. Sys. spd. dial	5. Ext. fwdg.	6. Ext Fwd to toll #	7. Trunk-to-trunk
XXX	Default	Y	Y	N	N	N
100	Jane	Y	Y	N	N	N
101	Roger	Y	Y	N	N	N
102	Sally	Y	Y	N	N	N
132	Bill	Y	Y	N	N	N

The programming steps are:

1. Extension number — Enter the extension number to program.

2. Extension name — Name the extension (if not previously named in Function 31 [see page G.1]).

For each of the following features, press a scroll key (or   ) to select *YES* or *NO*.

3. Toll restriction — "YES" allows the user to place toll calls. If you select "NO," the user can make only either non-toll calls or calls to numbers listed in the allow exception table.

4. System speed dial — "YES" allows the user to access and place system speed dial calls.

5. External forwarding — Allows the station user to enable the off-premises "reach-me" feature. The off-premises reach-me feature allows a caller that has been forwarded to voice mailbox to be transferred to an outside number. See the *User's Guide for IVX S-Class with Integrated Answering Machine* for more information about the Off-Premises reach-me feature.
Default: Disabled.

6. External forwarding — This feature is used in conjunction with external forwarding. When enabled, this feature lets the user program a long-distance number for external call forwarding.

> **Note:** After the system dials the external forwarding number, a prompt will be played saying, *"You are receiving a forwarded call. Press any key to accept."* This prompt will play continuously for 30 seconds. If the forwarded call is answered and the called party dials a digit, the forwarded call will be connected to the called party. If no digit is dialed, the caller is automatically forwarded to voice mail. While the two lines (trunks) are connected, the system constantly monitors the lines for open loop conditions (hang-up). If an open loop is detected on either line, the call is disconnected. The system also monitors for voice activity on the connected lines. If voice is no longer detected, the call is disconnected. Finally, if both lines are connected for more than 60 minutes[1], the call will be disconnected.

7. Trunk-to-trunk transfer — When enabled, this lets the station user initiate a **trunk-to-trunk transfer.** The user, while connected to a CO line, can press **TRANSFER**, dial an off-site number and then complete the trunk-to-trunk transfer by simply hanging up. Both outside parties are then connected.
Default: Disabled.

> **Important:** USE OF FEATURES, SUCH AS TRUNK-TO-TRUNK TRANSFER, THAT REQUIRE TRUNK-TO-TRUNK CONNECTIONS WILL INCREASE THE RISK OF TOLL FRAUD. IN NO EVENT SHALL ESI (ESTECH SYSTEMS, INC.) BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES WHATSOEVER INCLUDING, BUT NOT LIMITED TO, FRAUDULENT TOLL CHARGES, LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTIONS OR ANY OTHER COSTS OR DAMAGES RELATED THERETO ARISING FROM THE USE OF THESE FEATURES.

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[1] The default timer can be made longer or shorter.

Function 33: Department programming

You can create up to 10 **departments** (or "hunt groups"), each with a maximum of 14 extensions. You also can assign an extension to more than one department. Department numbers range 290–299.

Department hunting methods

You can designate a department to be rung in the following method:

• **All** — Calls will ring all listed phones at the same time. If no extension answers or all are busy, the call will call forward as programmed as part of this function.

Procedure

Here's an example of a completed programming worksheet:

1. Ext.	2. Name	3. Type	4. CF day	5. CF night	6. List:
290	Sales	All	X100	MB501	All Extensions

Here are the programming steps.

1. **Department number** — Range is 290–299.

2. **Name** — Used for the display, reports, and as a programming aid. Length can be up to 10 characters (See "Entering alphanumeric characters," page D.2).
   Default: The department number.

3. **Type** — All calls will ring all listed phones at the same time. This is unchangeable.

4. **and 5**. **Call forward busy/no answer** — The department can be set to call forward busy/no answer (for all extensions in the department) to an extension, another department, or the Integrated Answering Machine.
   Calls routed to an extension via a department will follow the **department's** call forwarding. While calls transferred to the extension will follow the **extension's** call forwarding as programmed in Function 31 (see page G.1).
   Default: X100.

6. **Department list** — This list is automatically made up of all extensions in the department.

> **Example:** Here is a portion of a completed programming worksheet for Department programming. Department 290 will ring all extensions.
> If all are busy or do not answer, the call will forward to the operator (X100) if in day mode — or, if in night mode, to the Integrated Answering Machine (MB501) to let the caller leave a message. Department 291 is set up the same way, except X105 will ring if busy/no answer in Day mode.
>
> | 1.
Ext. | 2.
Name | 3.
Type | 4.
CF day | 5.
CF night | 6.
List: |
> |------------|------------|------------|--------------|----------------|-------------|
> | 290 | SALES | ALL | X100 | MB501 | All Ext. |
> | 291 | SERVICE | ALL | X105 | MB501 | All Ext. |

Function 35: Extension button mapping

By default, the programmable feature keys' initial state is "not programmed" (except in the case of station 100, on which the upper left key is a day/night key). Use this function to change the programmable feature keys **system-wide.** Users can later change the programmable feature key positions for **their** stations as part of station programming.

> **Important:** Future, system-wide changes made later here by the Installer will overwrite **any** station user programming.

When prompted, press the desired programmable feature key location, then enter the appropriate digits on the dial pad and confirm by again pressing the same programmable feature key.

To determine how a programmable feature key is currently programmed, press the key, note how it is programmed, and press the key again.

The keys can be programmed as follows:

CO line key

If the dialed digits are either **1–16** (Generation II) or **1**–**12** (Generation I), the key will serve as a CO line key.

> **Note:** Removing the line key appearances will set the station(s) to operate as a PBX with line access by dialing **9** (or **8** or **7**).

Station key

If the digits entered constitute a three-digit extension number (or department) the key will become a station key providing the appropriate lamp information (See "System fixed numbering plan," page D.2).

Speed-dial key

If one enters **9** (or **8** or **7**) plus a phone number, the key will become a speed-dial key for outside calls. Alternatively, the user may enter the system speed-dial bin (600–699).

Feature keys

Feature keys, as listed below, cannot be programmed system-wide but, rather, must be programmed for each individual station.

Code	Feature	Available on 12-Key Phone	Available on all 24 and 48-Key Phones	Available to Master Station Only
199	Overhead page	X	X	
560	Day/night mode		X	
564	Headset		X	
565	Call forward	X	X	
565YYY	Call forward to an extension	X	X	
568	Message monitor			X
570	Conference	X	X	
571	Greeting 1			X
572	Greeting 2			X
573	Greeting 3			X
575-576	Virtual Answer		X	
578	Mute/DND	X	X	

- **Manual day/night mode (Code 560)** — Allows manual setting of the system's mode — day or night.

  > **Note:** You or the Administrator can also change the mode and/or re-record the greeting remotely to handle unexpected closings, such as for inclement weather.

- **Headset key (Code 564)** — Provides for easy connecting to/disconnecting from calls when the user is operating in headset mode. The user presses the key to receive dial tone or to answer a ringing call; he/she then presses the key again to disconnect from the call.

- **Call forward key (Code 565 or 565XXX)** — Toggles call forwarding on and off. If the user always forwards to the same extension, you (or the user) can program a key with both **5 6 5** and the extension number.

- **Message monitor key (Code 568)** — Toggles message monitor mode. (Functionally is same as pressing **PROGRAM 3 6** and following the prompts.)

- **Conference (Code 570)** — Serves the same function as the **CONF** fixed-feature key.

- **Personal greeting keys (Codes 571–573)** — **Master Station Only**. These provide for easy activation of one or more of the user's personal greetings. Each key's LED will be green for the associated personal greeting that is active. These keys can be used in place of, or in conjunction with, manual activation of the greetings in programming mode.

- **Virtual Answer keys (Codes 575–576)** — You can program a **Virtual Answer Key** to play a greeting to a caller when the extension is busy and route the caller to a desired destination by pressing this key. Program a programmable feature key with either **5 7 5** or **5 7 6**. Prompts will instruct you in how to record the greeting and enter the caller's destination.

  > **Note:** This works **only** if call waiting is enabled for the station.

- **Mute/DND (Code 578)** — Serves the same function as the **MUTE/DND** fixed-feature key.

  > **Note:** To **delete** a programmable feature key, press **HOLD** instead of programming a value.

Private line key

If a private line has been established in CO line programming (see "Private line," page F.2), that CO line key must appear on that station's phone to allow outbound access to the line.

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Function 5:
Integrated Answering Machine programming

Function 54: Answering Machine Members — MB501

The Integrated Answering Machine can record up to two simultaneous calls. When a message is left, the message indicator will light on the 24 or 48-Key Feature Phone of each member of **mailbox 501**. Messages can be retrieved by any authorized 24 or 48-Key Feature Phone or remotely from an off-premises location. Only one user can access the mailbox at a time. The system can also be programmed to call an off-premises number to deliver messages or notify a pager.

The first member in the **Master List** (which may hold up to 24 members) is allowed to program the Integrated Answering Machine via the **PROGRAM** key. This station is designated as the **Master Station**. All other users will only be able to play and delete messages. Only a 24 or 48-Key Digital Feature Phone can be installed on an extension designated as the Master Station. However, a 12, 24, or 48-Key Digital Feature Phone can be installed on an extension in the Master List.
Default: Ext 100.

Function 55: Message notification

The system can be programmed to call an off-premises number or another extension to deliver messages or dial to an external commercial paging network to activate a user's pager. IVX S-Class will call or page when the first new message has been left in the mailbox and will repeat (at the interval of minutes programmed in this function) until the new message(s) have been deleted, saved or moved.

The user can program either a phone *or* pager number.

The Installer and Administrator can set, on an individual-station basis:

- The number to be called
- A delay period
- The number of attempts (maximum of 99)
- The interval between attempts
- A "quiet period" to suspend phone delivery — *e.g.,* late at night (the quiet period is an on-and-off time that applies to all days of the week)

> **Note:** Only pager *or* phone notification can be programmed, not both.

(Continued)

Function 551: Station delivery options

Programming of the station options, as shown below, can be performed by the Installer or Administrator. In addition, the user can change his phone number and pager number (but not phone or pager delay time). The phone number's maximum length is 24 digits.

	1. Number	2. Delay	3. Attempts	4. Interval	5. Quiet on	6. Quiet off
1. Phone	9725556789	30	6	60	10:30PM	7:15AM
2. Pager	9725551234	0	10	30		

To program, enter **5 0 1 #** (to select mailbox 501) and choose **1** for phone number or **2** for pager number. Then, follow the prompts to set the parameters below.

1. **Phone/pager number** — The number to be dialed (**without** the CO line Group *[9, 8* or *7]*).
2. **Delay** — How many minutes the system is to wait before dialing the phone or pager number. This allows the user to pick up a message if he is in the office.
   Range: 0–500. **Default:** 0.
3. **Attempts** — How many times the system will call/page.
   Range: 0–99. (0 turns off delivery.) **Default:** 3.
4. **Interval** — How many minutes should elapse between attempts.
   Range: 10–1440. **Default:** 30.
5. **Quiet period on** — Phone only. When the quiet period should begin.
   Default: (None.)
6. **Quiet period off** — Phone only. When the quiet period should end.
   Default: (None.)

> **Note:** For the **Quiet period on** or **Quiet period off** parameters, a value in **either** of *0:00* is invalid and will cause notification not to work.

Code	What it produces
#	# DTMF tone
✱	✱ DTMF tone
F	Flash hook
P	2-second pause

To insert a special code, press the right scroll key ( ) to select the desired special code: **#** , **✱** , **F** or **P**. Press **#** to confirm the inserted character and continue. Press **# #** to complete the entry. Use the down arrow key ( ) to backspace.
Once the number is saved you can use the scroll keys to move back and forth to view the number. To edit the number, you must delete it and enter the correct number.

Function 552: Delivery/paging parameters

The sequence of programming is as follows:

1. **CO line access** — Enter the CO line group (9, 8, or 7) that is to be accessed for delivery.
   Default: 9.
2. **Pager dialing pause** — When paging, IVX S-Class will send the mailbox number to be shown in the pager's display. To allow time for the paging service to answer, enter the pause, in seconds, to occur between when IVX S-Class dials the pager number and when it then dials the mailbox number.
   Range: 0–20. **Default:** 6.

Function 6: Recording

Function 63: Message-on-hold (MOH) programming

MOH can be:

• A live feed from an external music source connected to the MOH connector located on the side of the cabinet.

• One of three default, generic MOHs pre-recorded by the factory.

Function 631: MOH source

This selects the source that will be played to callers on hold.

Code	Source
590	Live external source*
591	Pre-recorded music
592	Pre-recorded with *"please continue to hold"*
593	Pre-recorded with *"dial 0 or extension from hold"*

* Dialing off-hold doesn't work.

Default: 592 (generic message-on-hold).

> **Notes:** If an external audio source such as a radio is used for MOH, adjust the volume at
> the source.
> To turn live MOH volume completely off, turn off volume at the source.

(This page included for pagination purposes only.)

Feature description:
SMDR

SMDR (station message detail reporting) call records are output in real time via an ESI phone system's **Maintenance/SMDR** serial port. Connect a standard serial printer or call accounting system to the serial port. SMDR data will be stored temporarily if a laptop is connected for programming (five minutes after you exit programming mode, the buffered SMDR will resume output to the serial port).

The output from the serial port is: 8 data bits, 1 stop bit, and no parity, 1200 baud.

SMDR may be output in one of two formats, selected in system programming: **tabular** or **CSV**. The tabular format is the default.

Tabular SMDR format

The tabular IVX SMDR output format, which is compatible with the standard Panasonic® DBS® format, is as shown below:

```
          1         2         3         4         5         6         7
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678
T MM/DD HH:MM:SS HH:MM:SS NNN XXXXXXXXXXXXXXXXXXXXXXXXXXXX                            LL
```

The columns are:

• **Call type** — Outbound ("O"), inbound ("I") or transferred ("T") at column 1.

• **Date** ("MM/DD") — Begins at column 3.

• **Start time** ("HH:MM:SS") — Begins at column 9.

• **Duration** ("HH:MM:SS") — Begins at column 18.

• **Extension number** ("NNN") — Begins at column 27.

• **Digits dialed** (right-justified)**/Caller ID** (left-justified) — Begins at column 31 (28 characters).

• **CO line number** ("LL") — Begins at column 77.

Each record is terminated with a line feed and carriage return character.

CSV SMDR format

The **comma-separated value (CSV)** format is compatible with *Microsoft® Excel®* and other spreadsheet applications. A CSV record will be output for each completed call, and will be represented as follows (word-wrapped):

Format:
```
"T","MMDDYYYY","HHMMSS","HHMMSS","NNN","XXXXXXXXXX. . .XXX","CCCCCCCCCC. . .CCC","LL"
```

Example A:
```
"I","07042002","000852","000059","101","9724229700","ESTECH SYS INC. ","54"
```

Example B:
```
"O","10312003","221502","020512","190","12125551212","","11"
```

(Continued)

The fields are:

- **Call type** ("T") — Outbound ("O"), inbound ("I") or transferred ("T").
- **Start date** ("MMDDYYYY") — Six characters, zero-filled.
- **Start time** ("HHMMSS") — Six characters, zero-filled; 24 hour clock.
- **Duration** ("HHMMSS") — Six characters, zero-filled.
- **Extension number** ("NNN") — Three characters, space-filled, right-justified.
- **Digits dialed/Caller ID** ("XXXXXXXX . . . XXX") — Up to 28 characters, null-filled.
- **Caller ID name** ("CCCCCCCCC . . . CCC") — Up to 24 characters, null-filled.
- **Line number** ("LL") — Two characters, null-filled, right-justified.

Each field is delimited with double quote marks and separated with a single comma. Null fields are still included as place holders (see Example B, p. J.1). Each record is terminated with a line feed and carriage return character.

Reporting conventions and rules

- Inbound and outbound call records are generated only for calls between a station and a CO line.
- The duration of each call record represents the period of time that that station controlled its portion of a call. A record is generated each time a station does any of the following:
  - Disconnects.
  - Places a call on hold.
  - Transfers a call.

  A single CO call could be included in multiple records if it is transferred from station to station.
- Periods when calls are placed on hold or attempts at supervised transfers are unsuccessful are included in the station's record.
- Periods when calls are on hold, in the auto attendant, leaving/retrieving voice mail or in an ACD queue are not included in call records.
- A new record begins when a station answers a call or a hold recall.
- Records will be generated independently for all stations in a conference. If more than one CO line is involved in a conference, each call record generated by that conference will be associated with only the last line disconnected.
- Dialed digits don't include the line group or location number.
- Outbound calls begin a call record 10 seconds after the call has cleared toll restriction.

PC interface

Use an RS-232C cable to connect a PC's serial port to the IVX system's **Maintenance/SMDR** port.

When connected to the IVX system, the PC resets the baud rate for faster communications. Once the PC/IVX connection is made, the Installer can update system software.

> **Note:** SMDR data will be stored temporarily if a laptop is connected for programming (five minutes after you exit programming mode, the buffered SMDR data will resume output to the serial port).

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