

# ZIP 4x5

## IP Telephone

### Overview

The ZIP 4x5 integrates the functions of a switch and router with a business phone, and adds additional functionality for ease and convenience. The phone is referred to as a “four by five” because it has four call appearances and five circuits. Four of the circuits connect to an Ethernet LAN or broadband connection, and one circuit provides an analog connection to the PSTN.

The ZIP 4x5 simplifies remote connectivity to the corporate network and phone system. The switch and router integrates firewall, NAT, and VPN functions. The device can connect directly to a broadband Internet connection such as a DSL or cable modem. With four external Ethernet ports, three additional IP devices such as computers, printers, and other phones can also connect to the network.

The ZIP 4x5 supports multiple options for hands free operation. The phone includes a standard headset jack, full duplex speaker phone with acoustic echo cancellation, and Bluetooth for use with a wireless headset. Voice activated dialling allows users to initiate calls without touching the phone. With a wireless headset, users can answer calls even when they step away from the phone.

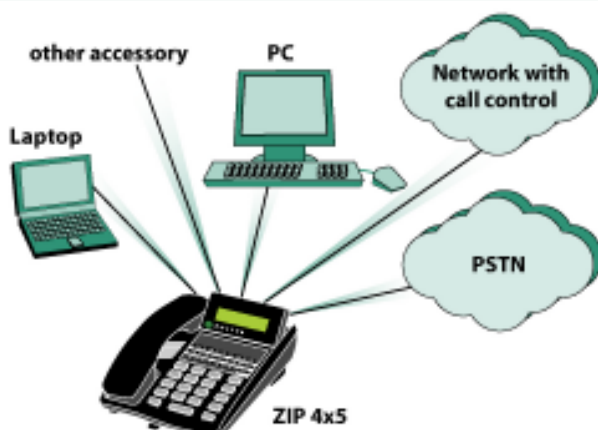
The ZIP 4x5 is 100% based on open standards. It uses SIP for call control, making it compatible with Windows Messenger and any IP phone system using the SIP standards. The switch on the phone supports all applicable standards for VLANs and QoS, ensuring it is compatible with any network, new or old. The phone can be powered from an ac adapter or receive power over an Ethernet connection.

The phone is simple to install and deploy. It is appropriate for use in the business office or in a home office. It can be managed from either location and can be provisioned at the business office before being given to the remote worker. The user of the phone never needs to make changes to the configuration. Users can plug the phone into their broadband connection and be productive in minutes.

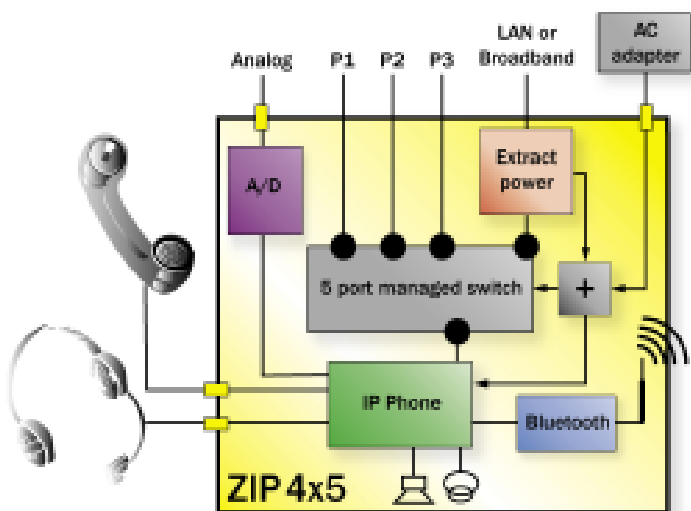


### Key Features

- *Firewall, NAT, VPN, and DHCP server provide a complete solution for the remote worker*
- *Four call appearances support four simultaneous calls*
- *Four 10/100 Ethernet circuits connect to the LAN and three additional devices*
- *Analog interface for connecting to the PSTN*
- *Bluetooth support for wireless headsets*
- *Voice activated dialling*
- *Buttons and keys for all commonly used functions*
- *11 LEDs provide instant indication of status*
- *Speaker phone mode with acoustic echo cancellation for high quality audio*
- *Intercom feature for automatic answer of internal calls*
- *Standard 2½ mm headset jack with headset included*
- *Receives power from Ethernet connection or ac adapter*
- *Speech encryption for secure conversations*
- *SIP based – will operate with any standard IP phone system*
- *Browser and TFTP support for configuration and updates*
- *Based on highly stable embedded Linux operating system*



## ZIP 4x5



### Physical Convenience

The phone has the appearance of a traditional business telephone set. There are 35 buttons and keys for convenient access to every standard feature, such as hold, transfer, conference, do not disturb (DND), call forward, call park, and call pickup.

There are 11 LEDs that show red, green, and orange, each appropriately marked. With these, a user can quickly identify the status of the phone, calls, or the phone system. There is separate indication for new voice mails, new instant messages, new incoming calls, calls on hold, conference calls, mute, forwarding all calls, do not disturb, calculator mode, program mode, and user log in.

The phone occupies no more space than a standard analog phone, but by incorporating the IP phone, analog phone, Ethernet switch, and IP router, it saves space on the desktop and reduces the number of ac outlets required.

### Hands Free Operation

The ZIP 4x5 accommodates different modes of hands free operation.

The phone supports Bluetooth for wireless headsets. The phone can be purchased with or without a wireless headset. When a Bluetooth headset is used with voice activated dialling, users are completely free from touching the phone for making and receiving calls.



The phone also has a 2½ mm jack that can be used with any standard phone headset. A headset is included with the shipment of a ZIP 4x5, but the user can plug into the jack his or her own headset from other analog or mobile phones. Users can also use headsets that plug into the handset connector instead of the 2½ mm jack.

The speaker phone provides full duplex communication with acoustic echo cancellation. This gives high quality audio if the phone is used on a desk or in a conference room.

You can configure the device to behave as an intercom so that all internal calls are automatically answered by the speakerphone after one ring. This feature allows users to be reached without needing to physically pick up the handset or headset.

### Dialling

When using the key pad, users can dial a destination by phone number, SIP address, or IP address. Letters and special characters on the key pad operate similarly to that of the mobile phone. A SIP address can be abbreviated, for example to "sales". The phone supports hot key dialling so that users can enter a number, IP address, or name prior to seizing a call appearance or picking up the handset. This allows users to review and edit the destination address prior to calling.

The ZIP 4x5 provides a phone book for storing the contact information of 100 individuals. Phone book entries can be easily searched, inserted, modified, and deleted. Each entry contains a name and destination address (phone number, IP address, or SIP address). Each entry can be recalled by dialling a two digit number. The first five memory locations are mapped to five buttons on the phone for immediate access.

The phone supports voice activated dialling for ten names in the phone book. The names are trained to the user's voice. The user can subsequently initiate dialling by speaking a name instead of using the key pad. Voice activated dialling can be used with the handset, wired headset, speaker phone, or Bluetooth headset.

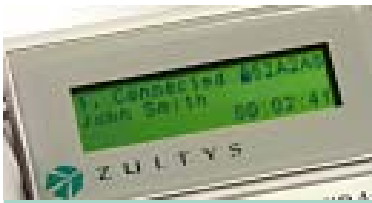
The phone remembers the last 32 numbers dialled and the caller IDs for the last 32 incoming calls. These lists are quickly accessed from one button on the phone.

### Conference

The ZIP 4x5 supports conferencing with three to five people. The conference is easily set up with any combination of inbound and outbound calls. A conference can be established with a call on the analog interface as well as calls from the IP network. Individual members can join or leave the conference at any time. The conference can be put on hold, allowing the other parties to continue without the host. The host can use a free call appearance to place or answer another call. The LEDs on the call appearance buttons show a different color to indicate those calls involved in the conference.

### Encryption

The phone can encrypt the voice stream to another ZIP 4x5 or other equipment that supports 128 bit AES encryption. Users can activate this function before or during a call. This prevents the conversation from being heard using a LAN monitoring device. A conference call can be entirely encrypted when all parties use phones that are capable of encryption.



The encryption code is displayed so parties at both ends can ensure that the call has not been intercepted. The additional bandwidth required to support an encrypted call is negligible, requiring only 2% more than an unencrypted call.

### Calculator

The phone incorporates a calculator that can represent numbers up to 12 digits in fixed and scientific notation. A user can easily put the phone in calculator mode and still use the phone to make or receive calls. At the end of a call, the phone displays the calculator exactly as it was prior to the call.

### Power over Ethernet

The LAN port on the ZIP 4x5 switch supports the IEEE 802.3af standard and is capable of receiving power over the Ethernet connection. This power is sufficient to allow the ZIP 4x5 to perform all of its functions without the need for an external ac adapter.

The phone is shipped with an ac adapter. Using this reduces power dissipation in the network room and allows use of the phone when LAN power is not available. If ac power fails and the LAN can supply power, operation of the phone is uninterrupted.

### Connections

The ZIP 4x5 has a five port managed switch so users can connect other devices without any additional investment in an external switch. One switch port is used internally and four ports are available for external connections. One external port is dedicated as the uplink into the network and the other ports are used to connect to external devices such as PCs or printers. The Ethernet ports support auto MDI-X so they can be connected to other devices with straight through or crossover cables. All ports perform auto negotiation of link speed and determine whether operation will be full or half duplex.

The switch is based on hardware, not software running on the processor. All ports are capable of switching Ethernet traffic at wire speed. This allows it to forward traffic at line rates without limitation, thus ensuring that devices downstream are not starved of bandwidth.

The phone has an analog circuit that can connect to the PSTN. This is very useful for the SOHO user, who can make and receive calls over this interface.

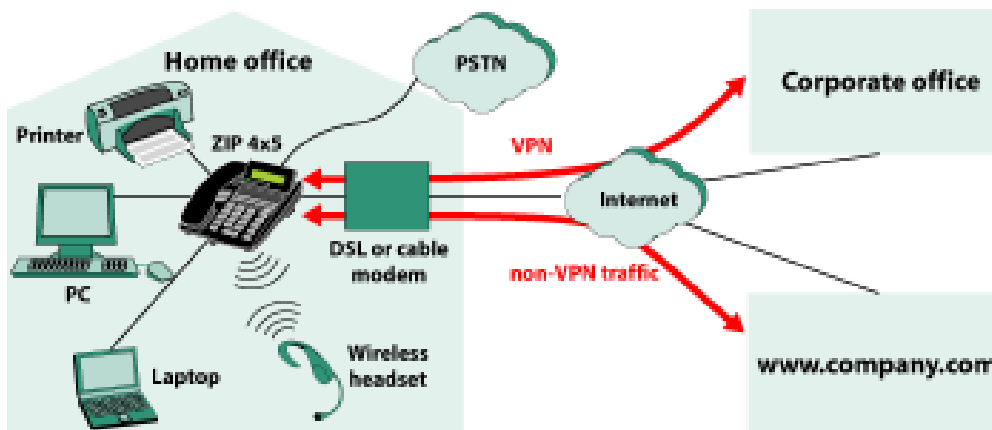


### Remote Worker Solution

The ZIP 4x5 is the perfect solution for the remote worker. It incorporates firewall and VPN functions, so no external router is required. The phone connects directly to the broadband Internet connection and supports PPPoE and STUN. It is compatible with all Internet Service Providers.

The phone supports G.711 (A-law and  $\mu$ -law) and G.729A. The G.729A compresses the audio to about 24 kb/s to minimize the bandwidth requirements for the speech. This is particularly important for remote workers.

The phone includes a DHCP server and NAT so that other devices can be placed downstream of the phone. On a port by port basis, VPN tunneling is provided so that PCs can also be on the corporate network. Traffic from other ports or traffic that is destined for the Internet does not flow over the VPN tunnel. The remote worker has access to all corporate resources, just as if he or she was working in the office.



Example of Deployment for a Remote Worker

When a call comes into the corporate office it is directed to the remote worker's phone. In a similar fashion, the outbound calls can be made to users in the corporate office and to the outside world through the phone system at the corporate office. For local calls the remote worker can use the PSTN connection that is plugged directly into the ZIP 4x5. When emergency numbers are dialed, the ZIP 4x5 can automatically route calls to the local PSTN.

### VLAN and QoS Support

By default, all ports on the switch are untagged members of a single VLAN, so the switch can interoperate with any network. The switch supports the configuration of up to eight VLANs. Each port can be a member of a tagged VLAN, a member of an untagged VLAN, or excluded from a VLAN. Full support for IEEE 802.1q VLAN tagging and IEEE 802.1p QoS settings allows the ZIP 4x5 to provide enhanced quality of service functions at the Ethernet layer and operate in a modern network.

At the IP layer the ZIP 4x5 supports the ability to mark the lower six bits of the IP QoS byte with the various differentiated services code point (DSCP) markings. This allows for up to 64 codepoints to be defined which map to various per-hop behaviors (PHBs). The ZIP 4x5 internally has eight different priority queues which correspond to the IEEE 802.1p priority levels and DSCP values. This allows for the prioritization of voice and signalling traffic over the best effort data traffic. Each queue is serviced in such a way that no particular queue is starved.

### LCD

The LCD has adjustable contrast and viewing angle to suit the lighting. It intelligently shows users all relevant information without any soft keys being required. All information about a call is displayed, such as the name and number of a caller and its duration. For incoming calls the LCD displays the intended recipient of the call, which is useful if the phone is shared. For conference calls, it displays the name of each person on the call and their associated call appearance.

The LCD also indicates when a call is encrypted to assure users that their call is secure.



### Preferences and Settings

There are many parameters on the phone that allow it to operate in the network. The phone automatically downloads these at power on from a configuration file that is generated by the system administrator. On the phone, these settings are protected by a password. The user can customize personal preferences without preventing the phone from functioning properly in the network.

For individual deployments, or to make quick changes, the phone incorporates a browser interface so that it can be easily provisioned without a server.

Internal and external rings are programmable. Users can choose the call announcement tones by selecting a WAV file stored on the network by the system administrator. This allows a user to select sounds that can distinguish the ring on his or her phone from other phones nearby.

### Date and Time

The phone uses NTP to automatically obtain the date and time from the network. However, the date and time can be set manually in the absence of an NTP server. The phone displays the date and time, the start time, and the duration of each call on the LCD.

### Technology

The ZIP 4x5 has an internal computer capable of performing 400 MIPS. This internal computer runs a highly reliable real time embedded Linux operating system. The phone externally looks and behaves like a regular business phone, and not like a computer with a handset attached.

The ZIP 4x5 uses the SIP protocol that is now widely recognized as the standard for IP telephony. The ZIP 4x5 performs all of the functions of a user agent client and a user agent server. It can be used with all standard SIP servers, making it a truly open IP phone.

The phone incorporates comprehensive self tests and diagnostic capabilities. These allow for rapid isolation and resolution of problems associated with deployment.

### Physical and Environmental

**Operating temperature:** 10° C to 40° C (50° F to 104° F)

**Storage temperature:** 0° C to 50° C (32° F to 122° F)

**Weight:** 0.9 kg (2.0 lb). Shipping weight 1.6 kg (3.6 lb)

**Size:** 180 mm (W) x 230 mm (D) x 100 mm (H) (7" x 9" x 4")

**Safety:** UL 60950, CSA-C22.2, EN 60950:2001

**EMI:** FCC Part 15, ICES-003 Class B, CISPR 22, AS/NZS 3548 Class B

**Bluetooth:** FCC Part 15.247, EN 300 328, EN 301 489-17

**Analog:** TIA/EIA-968, ETSI TBR021, AS/ACIF S002:2001

**EMC:** CISPR 24 (EN55024:1998), EN61000

**Power over ethernet:** IEEE 802.3af-2003

**Warranty:** one year



The phone can be ordered with or without the Bluetooth headset. Everything you need to get up and running comes with the shipment, including LAN cable, phone cable, ac adapter, headset, instruction card, and Quick Start guide.