ZETRON®

2000 Series

Paging Terminals

Zetron Models 2100 and 2200 Paging Terminals and the 2200EX Expansion Terminal

Utilities Applications

RCCs and PCPs

Hospital Applications

Industry Applications

ZETRON 2000 SERIES BENEFITS

For Wide-Area Service Providers:

- Small initial system size and easy field upgrades allow service providers to grow with their customer base
- TNPP and satellite downlink capability lets systems be part of area-wide and nationwide networks
- Advanced call routing creates new opportunities by integrating paging and voice messaging/retrieval with two-way radio and telephone answering services
- DID and foreign exchange lines support multiple services
- Advanced database management, diagnostics, and billing support help operators manage their systems for maximum profitability
- System voice prompts present a professional image to customers and eliminates caller confusion
- Integrated voice messaging/retrieval gives operators more services to sell

For In-Plant Systems:

- Priority and group paging allow the creation and support of emergency response teams
- Outdial TAP capability allows pages from the terminal to be routed to outside carriers for wide area paging
- Local telephone, desktop entry station, and serial input interfaces allow paging from several different sources
- Availability of unusual paging formats means existing pagers do not have to be replaced or discarded
- Serial TAP interface allows external systems to automatically send display pages. (Nurse-call, alarm monitoring, and CAD)
- Multiple telephone interfaces (DID, E&M, T1, end-to-end) means no costly upgrades to existing phone service and PBX systems

INTRODUCTION

The 2000 Series represents Zetron's top-of-the-line paging terminals. The 2000 Series offers the system operator an affordable, entry-level platform upon which sophisticated features and additional capacity can be built as required. Advanced capabilities can be integrated into the initial purchase, or can be added later as easy field upgrades.

Zetron's commitment to advanced technology at low cost is fulfilled with the 2000 Series. Component standardization simplifies system maintenance and upgrades. The software-intensive design allows a high degree of flexibility and enables system operators to fine-tune their terminals' performance to an unprecedented degree. This software-based approach also means that many older systems can be updated with the very latest features at a relatively small cost.

2000 SERIES MODELS

The 2000 Series paging terminals are ideal for growing systems. A Model 2100 or 2200 can be configured to fit the present application and be expanded incrementally as growth occurs.

Model 2100

The Model 2100 is cost effective for as few as two or three hundred users. Its modest size belies its flexibility: the Model 2100 can support the same wide range of advanced features as the Model 2200. If the Model 2100's capacity is exceeded through growth, it can be upgraded by switching to a Model 2200 chassis. The internal cards can be transferred to the new chassis because they are common throughout the 2000 Series. This way, the major part of the investment in the paging terminal is retained as the system grows.

Model 2200

The Model 2200 is the best choice for applications requiring its larger capacity for pagers, telephone trunk interfaces, and voice storage. Only a small additional cost over the Model 2100, the Model 2200 is the wisest choice for system operators who expect to grow quickly or whose initial requirements would put the Model 2100 near its maximum capacity.

Model 2200EX

The Model 2200EX ensures that the system operator has a growth path beyond the basic capacities of the Model 2200. With the addition of a Model 2200EX, the Model 2200 can grow to support 38 telephone trunks and 50,000 pagers. Furthermore, a second EX chassis can be added, increasing trunk capacity to 58.

Redundant System Controller

The Standby System Controller (SSC) offers the ultimate in system redundancy by monitoring the primary terminal, and automatically switching over to a backup terminal in the event of a failure. The SSC monitors power supply levels, transmitter keying intervals, and CPU status of the primary terminal.

SYSTEM CAPABILITIES COMPARISON

	2100	2200	2200 with 2200EX	2200 with Dual 2200EX Chassis
Pagers (standard/max.)	2,000/3,000	2,000/10,000	2,000/50,000	2,000/50,000
System Card Slots	5	6	6	6
Interface Card Slots	5	10	20	30
Telco Trunk Interface (max)	8	18	38	58
Radio Channel Interface (max)	2	4	8	8
Dimensions (H x W x D)	21" x 17" x 5.5"	30" x 22" x 7"	21" x 22" x 7" *	21" x 22" x 7" *
Weight	40 lb.	75 lb.	60 lb. *	60 lb. *
Power Supply (AC input: 115 or 220/240 VAC, 47-63 Hz)	80 watts, max.	200 watts, max. (48 VDC input power supply optionally available)	400 watts, max.	600 watts, max.

** Applies to 2200EX chassis only*

PAGING CAPABILITIES

Numeric and Alphanumeric Display Paging

The 2000 Series fully supports a variety of digital display formats, including Golay (GSC), POCSAG (512, 1200, and 2400 baud), Multitone, and FLEX™ (optional).

The 2000 Series can support numeric pages via DTMF inputs, and it has two unique ways for callers to send alphanumeric pages from a DTMF telephone. The first feature lets callers select from one hundred “canned” alphanumeric messages that the system operator has programmed into the system. The second feature lets callers spell out their own alpha messages using the buttons on a standard telephone keypad.

Alphanumeric and numeric messages can also be entered by operators using remote terminals connected both locally via serial cable and via modem. See the section on “TAP paging and TNPP networking” for additional information about remote page entry.

Voice Paging and Storage

Excellent voice quality is one of the outstanding features of the 2000 Series. Zetron’s implementation of digital voice technology results in audio clarity that is unsurpassed. Users can hear the difference.

Silence compression eliminates pauses in spoken messages to maximize radio channel use. The sensitivity of this compression can be adjusted as a software parameter to compensate for varying telephone line quality.

The Voice Controller can handle up to 4 Telco trunks which are recording voice pages simultaneously. Up to 28 voice channels can be added in blocks of 4 (for a total of 32). Ten minutes of internal voice storage is dynamically allocated to telephone interfaces on an as-needed basis, maximizing trunk efficiency by processing several calls simultaneously.

Priority Paging

Six levels of paging priority are supported, including “next out” and “breakthrough”. These priorities can be assigned both on a per-pager and on a per-interface basis. This allows key pagers to be set so that they are always the next out regardless of current traffic, and local operators can break through with live voice pages in case of emergency. The interrupted page is stored and resent after the emergency page.

Group Paging

Group paging is supported both for specific formats, such as two-tone group call, as well as for formats that do not inherently have group call capability. This feature supports 1,000 groups of up to forty-eight pagers each. Each group can mix dissimilar pager formats, and can even support both voice and display pagers in a single group. For maximum flexibility, a group can be a member of another group, and an individual pager can be in several different groups.

Countdown paging

Countdown paging allows the operator to sell a set number of pages to a subscriber. Before the pages are exhausted, a warning page is sent to the subscriber. This is useful when a subscriber is behind in payments or to sell pagers prepackaged with pager service.

Talk-Back

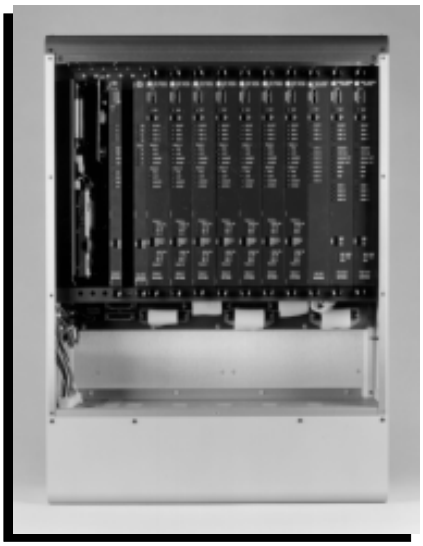
Talk-back allows two-way communication between telephone (land line) callers and mobile radio users. The 2000 Series supports half-duplex and full-duplex radio stations with carrier switching.

System Voice Prompts

The System Voice Prompts option uses a factory-recorded human voice to guide callers through the paging process. The prompts tell callers when to overdial a pager number, whether to speak a voice message or to enter a telephone number, and when an invalid number has been reached. These prompts can be easily modified by the system operator to fit a specific application. The same high-quality Voice Controller that records voice pages is used to record/replay system voice prompts. This option may be purchased individually or as a part of the PageSaver option.

Subscriber Recorded Prompts

The Subscriber Recorded Prompts option enables users to record their own voice prompts. The system operator can specify who has access to this feature, and how long their voice greetings can be. This option may be purchased individually or as a part of the PageSaver option.



The 2000 Series paging terminals take advantage of a versatile, modular design. Hardware capacity and options are added via insertable circuit cards.

Alarm Monitoring

When equipped with the Alarm Dialer Interface option, the 2000 Series paging terminal can accept calls from ADEMCO-compatible alarm dialers using the “ADEMCO 4/9 DTMF” (also known as “FAST”) protocol. Each alarm dialer can monitor up to 8 alarm points, and will initiate a display page if any change is detected by the dialer. In addition, an error page can be sent if the dialer fails to check in at specified intervals.

TELCO INTERFACE

There are two basic types of Telco interfaces supported by the 2000 Series terminals: analog and digital T1. Analog lines are supported via the Dual Telco cards. Digital T1 spans are supported with the Digital T1 Interface chassis.

Telco line types

Direct Inward Dial (DID) or E&M input from a telco central office is most commonly used by wide-area service providers. The caller dials a normal telephone number; the last 2 to 7 digits of this number are automatically sent to the paging terminal by the telephone company, selecting the particular subscriber to be paged.

The telco also offers digital T1 lines. Twenty-four DID channels are carried over a single T1 span, and partial spans can be supported by the 2000 Series.

Other types of lines (end-to-end, loop start, ground start, or E&M tie line) are answered with a beep tone and/or voice prompt. The caller then keys in the pager number using a touch-tone telephone. In-plant systems often use these line types.

Dual Telco Analog Interface Cards

The Dual Telco interface card supports two analog telephone trunks. Up to 29 Dual cards can be installed in a single 2000 Series system (with two Dual 2200EX chassis). There are two types of trunk cards. One type handles telephone company DID lines (either immediate or wink start), end-to-end, and DTMF overdial line. It also handles PBX lines (either loop start, E&M type I, ground start, or station). The second type of trunk card handles E&M 4-wire audio lines.

Dial click decoder

If the caller has a rotary (pulse-dial) telephone, the optional dial click decoder card is required. Note: the viability of dial click decoding depends on the type of telco CO serving each of the callers and the paging terminal. Consult Zetron for specific applications.

Dual multifrequency decoder

Most Telco trunks to a customer use Dual-Tone Multi-Frequency (DTMF) signaling. However, in some instances, Multi-Frequency (MF) lines may be supplied by the phone company. This option supports MF for both trunks on a Dual card.

Digital T1 Interface

The Digital T1 Interface is for carriers who want the economic benefits of T1 telephone service. Trunks that are carried over the T1 span are less costly than standard trunks both in telco charges and in paging terminal hardware. The cost of a Digital T1 Interface configured for 24 channels is significantly lower than the cost of twelve Dual Telco Interface Cards required to support twenty-four analog telephone trunks in the 2000 Series paging terminal. One or two Digital T1 interfaces can be connected to a single 2000 Series terminal.

When equipped with 4 Hex Trunk cards, the Digital T1 Interface supports all 24 trunks on a T1 span. If less than 24 trunks are required (a partial T1 span), fewer Hex Trunk cards can be installed to support partial T1 connections at a reduced cost.

TAP

TAP (Telocator Alphanumeric Protocol) was designed as a one-way protocol to be used by a piece of equipment sending pages to a single paging terminal, such as an alarm monitoring system or alphanumeric message entry station. It typically operates over a serial link either directly using an RS-232 port, or over a telephone line and modem. Dedicated serial TAP ports are available with the Multi-port Serial Interface option which comes with 2 to 8 serial ports. The Dual Telco interface cards and Digital T1 interface also support incoming TAP applications when equipped with alphanumeric messaging input modem option. When the call is to a DID phone number designated for TAP, the modem automatically starts trying to communicate using TAP.

OUTDIAL TAP

The outdial TAP Interface module is designed to send small to medium volumes of display pages from one terminal to another. It may be used to extend the coverage region for some users of an in-plant paging system, by calling up an external paging service.

TNPP

TNPP (Telocator Network Paging Protocol) was designed to tie paging terminals together in a network. A paging terminal that receives a TNPP packet can tell which pages to transmit, which ones to pass along to other paging terminals in the network, and whether any information has become corrupted.

TNPP networking is made possible in the 2000 Series terminals with either the Unidirectional TNPP Network Interface Card (for satellite downlink) or Bidirectional TNPP Network Interface Card (for full-duplex, land-based networks, and 2 way VSAT satellite based networks). The Unidirectional TNPP Network Interface Card comes with 1 input port. The Bidirectional TNPP Network Interface Card can support 2 to 8 direct TNPP connections. Dial-out TNPP is supported with the optional TNPP Buffer PC software.

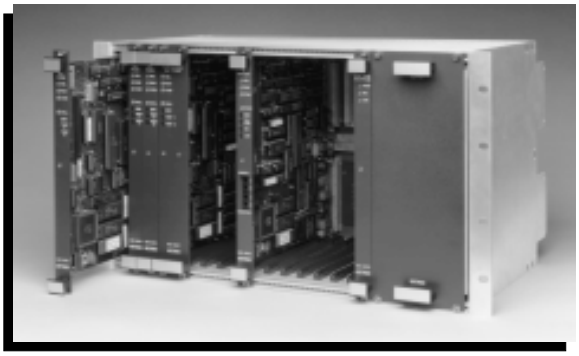
Please see the TAP and TNPP specification sheet for additional information.

PAGING TRANSMITTER INTERFACE

The paging transmitter interface is accomplished through the Radio Station card plugged into the 2000 Series chassis. The Radio Station card is quite versatile and can be adapted to many different transmitter control applications. Consult Zetron for specific applications.

Direct transmitter control

For direct control of a paging transmitter, digital outputs from the Radio Station card can modulate the FSK (frequency shift keying) input of the paging transmitter and change its modulation between analog (AC) and digital (DC) modes.



Digital T1 Interface

Remote transmitter control

The 2000 Series paging terminal is capable of controlling remote transmitters by encoding the paging site address, analog/digital mode, and transmitter key-up information as audio tone information (Motorola PURC® tone protocol) and sending the data over telephone lines, microwave or a radio link.

Optionally, Zetron's Model 66 Transmitter Control panel can be used at the transmitter site for controlling transmitters that do not support the PURC® protocol.

The Model 68 Transmitter System Controller is an ideal option for providing cost effective transmitter control for systems where high throughput is not an issue. The Model 68 allows a 2000 Series terminal with a single Radio Station card to selectively address up to 16 links to transmitters and transmitter systems.

Shared channel support

Some paging channels are shared with co-channel carriers. In these systems, it is necessary for the transmitter sites to notify the paging terminal when the channel is clear for transmission. The Radio Station card recognizes the COR/CAS signal (from a receiver monitoring the frequency). The paging terminal stores and sends pages destined for that zone when the "busy signal" is cleared.

Multiple Addresses

In low traffic situations, wide-area paging systems can be designed to avoid the expense of simulcast equipment. By arranging the geographical paging area into zones that do not overlap, the paging terminal can select each zone in sequence and reach all paging subscribers. With the Multiple Address option, up to 30 transmitters in a single zone can be addressed.

Morse code ID

The Radio Station card sends the Morse code station ID to maintain FCC compliance.

VOICE MESSAGING WITH PAGESAVER

The PageSaver option puts the most-asked-for features of voice messaging/retrieval systems right inside your Zetron paging terminal, eliminating expensive external voice messaging machines. With PageSaver you can: rent voice mailboxes, insure voice and numeric pages by putting them in mailboxes so subscribers can replay them over the phone, page subscribers when a message is deposited in their mailbox, even offer special announcement telephone numbers. Combining paging and messaging simplifies management, minimizes the number of phone lines, and reduces overall cost.

PageSaver is available in 5 basic sizes: 6, 12, 24, 48, and 72 hours. The number of hours is the amount of voice storage available for all the different types of messages. The number, length, and retention time of each subscriber's messages, pages, and voice greetings can be tailored by the operator. The Model 2200 can also be equipped with mirrored disk drives which backup personal prompts in the event of a drive malfunction.

Please see the PageSaver specification sheet for additional information.

CALL ROUTING WITH PATHFINDER

PathFinder is a software option for the 2000 Series Paging Terminal that is most effective when combined with PageSaver, the 2000 Series' voice messaging system. PathFinder call steering can route calls to outdial telephone trunks. Together with PageSaver, it allows integration of the paging system, voice messaging system, mobile radio interconnect, trunked radio, telephone answering service, and company PBX. One set of phone lines and one subscriber database can now be shared among these system components, with calls automatically routed to their proper destination.

For example, if a called mobile doesn't answer, the call can be forwarded to the PageSaver voice storage and a message may be left by the caller. Or, subscribers can change their activity modes to obtain live operator handling of calls at some times, pager notification or personal mailbox messages at other times, depending upon their individual needs. Rendezvous paging is also made possible with PathFinder. A caller can hold while a subscriber is paged. When the page is received, the subscriber calls the paging terminal and is connected with the caller.

Please see the PathFinder specification sheet for additional information.

SYSTEM MANAGEMENT THROUGH ZBASE

ZBASE is the database management program for the 2000 Series Paging Terminals, included with each paging terminal purchased. It allows the system operator access to the subscriber, group, and message databases.

In addition, ZBASE aids the system operator in monitoring system usage. Detailed reports on account status and call counts show the levels of service for all subscribers. Statistics are presented as graphs that show trunk, channel, TNPP, and voice storage use. System call logs keep a record of every page that the terminal handles.

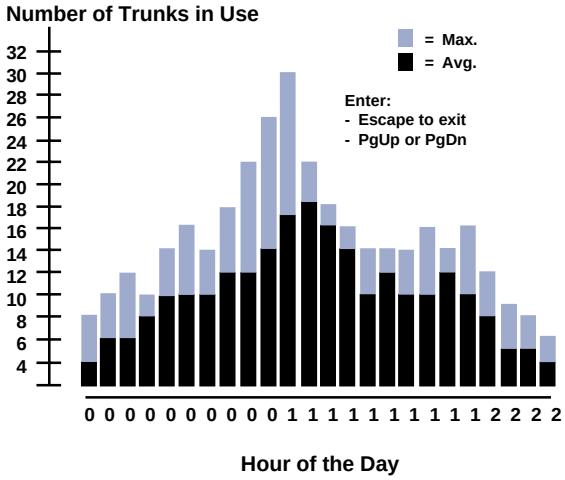
The basic version of ZBASE which is shipped with every 2000 Series terminal runs on a stand-alone PC. An option called Network ZBASE can be purchased which allows multiple operators on a network to use ZBASE at the same time. The operator menus for either of these configurations may be modified by the user to display in any language.

The EZBASE software option makes it possible for someone outside the office to dial-up and remotely work with the 2000 Series subscriber and group databases. The Secured Agent Access (SAA) option allows the system operator to limit the database editing privileges of individual remote agents.

The ZBIF option allows third party subscriber database and billing software to access the 2000 Series subscriber database. Eliminating double-entry of data into the billing system and then into ZBASE reduces data entry errors and speeds pager setup, insuring all active pagers are billed properly.

Please see the ZBASE specification sheet for additional information.

2000 SERIES STATISTICS



ZETRON SUPPORT

Providing the best customer support possible is a top priority with the 2000 Series. This is why Zetron has made an extra effort to ensure that system operators have the resources available to properly manage and maintain the system. This helps to prevent any problems from occurring, and helps to minimize down time if a problem does occur.

Remote factory support is accomplished through the dial-access modem that comes standard with every 2000 Series paging terminal. The paging terminal's system log files can be downloaded by Zetron support technicians at any time, allowing them to analyze the terminal's internal events and accurately diagnose the system's condition. Emergency support is available around the clock, so that factory response to critical problems is never more than a few minutes away.

System operators are provided with additional tools to make self-support easier as well. Automatic test pages can be generated from the ZBASE software when modifying subscriber records to insure correct setup. Every software configuration option that can be performed by factory technicians is explained in detail in the system installation and maintenance manual, so that system operators can make these changes themselves if they choose. The manual also explains the meaning of every code recorded in the system logs, so system operators can do their own diagnostics. The large (11" x 17") format of the 2000 Series schematics manual helps field technicians to be more efficient by making the documentation easier to read and easier to handle.

Factory training is available for those who want to acquire an in-depth knowledge of the 2000 Series architecture, programming, installation, and maintenance. This class consists of three days of lecture, discussion, and hands-on training with a 2000 Series paging terminal.

SPECIFICATIONS

GENERAL

Standard Model 2100 and Model 2200 are equipped with a hard disk for system software, subscriber database, and voice storage, as well as a 14,400 autobaud modem for remote programming, diagnostics, and factory support

Environmental	+40 to +120 degrees F. (+5 to +50 degrees C.), 10,000 ft. (3,000 m.) altitude, 8% to 80% relative humidity, non-condensing
Power (Model 2100)	
AC input	115/230 volts AC +/- 10%, 47-63 Hz 150 Watts maximum
Power (Model 2200)	
AC input	115/230 volts AC +/- 10%, 47-63 Hz
DC input option	40-70 volts DC 300 Watts maximum

TAP CAPABILITIES

Inbound TAP	Via telephone line modems or direct RS-232 connection
Outdial TAP	Up to 16 different destinations via single external modem

TNPP CAPABILITIES

Maximum nodes supported	64

TELCO INTERFACE

Interface Types (field configurable)	Central office DID selector-level (up to 7-digit feed), End-to-End loop and ground start (ring and overdial), PABX 2-wire trunk, E&M Type I 2-wire audio, Local Access telephone set for priority override. E&M Type 2 with 4-wire audio available as a separate interface
Line Coupling	600-ohm Transformer, adjustable balance duplex hybrid
Input	DTMF (0-9, *, #, A-D), Dial Pulse (0-9), optional MF R1 (0-9, KP, ST), MF R2 (for international use), 300/1200 baud modem (optional Alpha Messaging Input Modem), optional Dual Dial Click Decoder

RADIO TRANSMITTER INTERFACE

Configurations	Transmit only Paging, optional Transmit/Receive Talk-back Paging
Signaling Formats	
Analog	2-tone sequential, 5/6-tone analog
Digital	Multitone Mark IV/V/VI POCSAG (512, 1200, and 2400 baud), Golay Sequential code (GSC), NEC D3, D4, and FLEX (1600 baud)
Transmit Audio	Balanced 600 ohm transformer, selectable flat tone or -6 dB per octave de-emphasis @ 300-3000Hz, selectable flat voice or +6 dB per octave pre-emphasis
Format Encoding	Analog frequency accuracy +/-0.02%, analog tone distortion less than 0.2%, digital data stability +/- 2 ppm
Remote Control	Motorola PURC (sequential signaling of up to 16 transmitter zones per channel), Quintron SCM/SCU, tone formats. Four binary TTL leads provide information for outboard controller units to select up to 16 transmitter zones per channel

VOICE CAPABILITIES

Independent Voice Channels	4 to 32, each dynamically allocated to trunks on an as-needed basis
PageSaver Voice Message Retrieval	6, 12, 24, 48, or 72 hours voice storage, 999-second maximum voice message length, 100 messages per subscriber maximum (50 messages per mode), maximum message retention time is 255 hours

Zetron, Inc. PO Box 97004, Redmond WA 98073-9704 USA

Ph: (425) 820-6363 Fax: (425) 820-7031 Email: zetron@zetron.com Web: http://www.zetron.com

European Office: Zetron, Inc. 27-29 Campbell Court, Bramley, TADLEY, Basingstoke, RG26 5EG, UK Phone: +44 1256 880663 Fax: +44 1256 880491

See Zetron price list for option pricing. Specifications subject to change without notice. Literature number: 005-0262J September 2000