

# Series 2000 Paging Terminals

SPEC SHEET

The Series 2000 offers the system operator an affordable 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. 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 terminal 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.

## Series 2000 Models

The Series 2000 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 PAGING TERMINAL

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 through both chassis. This way, the major part of the investment in the paging terminal is retained as the system grows. Additionally, the Model 2200 offers optional RAID-1 hard drives. This simplifies system backups and virtually eliminates the possibility of system downtime due to hard drive failure.

### MODEL 2200 PAGING TERMINAL

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.

### DISK OPTIONS

The Model 2200 has an available RAID-1 disk-drive option for redundancy and minimum downtime in the event of disk failure. The user also has the option of using either a SSD (Solid State Drive) or standard SATA disk with the Model 2100 or 2200.

## Paging Capabilities

### NUMERIC AND ALPHANUMERIC DISPLAY PAGING

The Series 2000 fully supports a variety of digital display formats, including POCSAG, FLEXTM, Golog (GSC), and Multitone and many more.

The Series 2000 can support numeric pages via DTMF input from telephones, 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 Series 2000 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 Series 2000. 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 14 Telco trunks which are recording voice pages simultaneously. Up to 28 voice channels can be added in blocks of 14. 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.

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## 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 Series 2000 supports halfduplex 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 over dial 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.

## ALARM MONITORING

When equipped with the Alarm Dialer Interface option, the Series 2000 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

### 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. 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 10 Dual cards can be installed in a single Series 2000 system. There are two types of trunk cards. One type handles telephone company DID lines (either immediate or wink start), end-to-end, and DTMF over dial 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.

## 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.

## Telco Interface

TAP (Telocator Alphanumeric Protocol) was designed as a oneway protocol to be used by a piece of equipment sending pages to a single paging terminal, such as an alarm monitoring system, alphanumeric message entry station, personal computer, PC network, or 3rd party email or web-based paging software. 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 also support incoming TAP applications when equipped with alphanumeric messaging input modem option. When the call is to a DID phone number designated for alphanumeric access, the modem automatically starts trying to communicate using TAP protocol.

## 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 wide area paging service. Using Outdial TAP, the Series 2000 Paging Terminal can be configured to automatically forward a page to a public service provider after having been configured as a subscriber of that system.

## 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 Series 2000 terminals with the TNPP Network Interface Card. The TNPP card can be configured for unidirectional TNPP to support one-way satellite downlink, or bidirectional TNPP to support full duplex, land based networks, and 2-way VSAT satellite based networks. The TNPP Network Interface Card can support 2 to 8 direct TNPP connections. Dial-out TNPP is supported with the optional TNPP Buffer PC software.

Network destinations for pages are entered in the subscribers' database records as simple names instead of the cryptic hexadecimal node identification numbers that are used by the TNPP protocol. The destination name is cross-referenced to the actual node ID number in a lookup table in the system software. This means that if a change in the network configuration requires a new destination node ID, the system operator can make one change in the lookup table instead of hundreds or thousands of changes in the subscriber database.

## Paging Transmitter Interface

The paging transmitter interface is accomplished through the Radio Station card plugged into the Series 2000 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.

### REMOTE TRANSMITTER CONTROL

The Series 2000 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 Series 2000 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 systems.

With PageSaver you can: rent voice message boxes, insure voice and numeric pages by putting them in message boxes so subscribers can replay them over the phone, page subscribers when a message is deposited in their message box, even offer special announcement telephone numbers.

Combining paging and messaging simplifies management, minimizes the number of phone lines, and reduces overall cost. PageSaver comes standard with 72 hours 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. A terminal with the PageSaver option allows each subscriber any combination of the following options:

### VOICE MESSAGE BOX WITH NOTIFY

This service beeps a subscriber's pager every time a message is deposited in their message box.

### VOICE MESSAGE BOX

Subscribers with or without pagers can record voice messages that replay over their assigned telephone number

### PAGING

This is traditional tone-only, tone-and-voice, and display paging.

### PAGING WITH INSURANCE

If a subscriber misses or doesn't understand a voice or numeric page, they can phone in and hear it again.

### CALL FORWARD

A subscriber can have two pre-programmed numbers which forward to another subscriber.

## Simulcast through Model 600/620

The Series 2000 paging terminal can be interfaced to Zetron's High Speed Simulcast Paging System for efficient wide-area paging coverage.

The High Speed Simulcast Paging System uses timing information from the Global Positioning System (GPS) to synchronize the transmission of digital paging signals to very tight tolerances. This provides the microsecond timing accuracy necessary for high-speed simulcast paging with protocols such as POCSAG and FLEX®.

The system consists of the Model 600 Wireless Data Manager (Source Unit) and multiple (up to 1000) Model 620 Wireless Data Encoders (Destination Units). The link between the Source and Destination units may be any type (or combination) of link that can reliably transport data. Designed for nonproprietary transmitters, the system is ideal for cost effective build-out of new transmitter sites for public or private paging system operators.

Standard features include encoding for POCSAG (512, 1200 and 2400 baud) and basic FLEX (1600), support for up to 1000 destinations with TNPP routing and zoning capabilities, multifrequency transmitter control, Trimble Acutime 2000 compatible GPS interface, traditional two-level digital transmitter interface, and multiple user-definable input/output ports.

Optional features include enhanced four-level FLEX (3200 and 6400 baud) for the I20 transmitter interface, and support for other GPS devices.

## MODEL 600 WIRELESS DATA MANAGER

The Model 600 accepts TNPP input from up to three TNPP links, efficiently batches the pages with timing information from an attached GPS, and delivers the pages across a link to multiple Model 620 Wireless Data Encoders

## MODEL 620 WIRELESS DATA ENCODER

The Model 620 receives batches of paging data from the Model 600, and encodes the data for POCSAG or FLEX. At the precise time indicated by an attached GPS, the encoded message batch is sent to the transmitter, resulting in synchronous broadcast with other Model 620 controlled transmitters.

## System Management through ZBASE

ZBASE is the database management program for the Series 2000 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.

## Technical 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 an autobaud modem for remote programming, diagnostics, and factory support.

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

### TAP CAPABILITIES

Inbound TAP:	Via telephone line modems or direct RS-232 connection (up to 16 ports).
Outdial TAP:	Up to 32 different destinations via single external modem.

### TNPP CAPABILITIES

Maximum nodes supported:	64
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### TELCO INTERFACE

Interface Types	Central office DID selector-level (up to 7-digit feed), End-to-End loop and ground start (ring and over dial), 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.
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### TELCO INTERFACE (CONT.)

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.
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### SIGNALING FORMATS

Analog:	2-tone sequential, 5/6-tone analog
Digital:	Multitone Mark IV / V / VI / VII, POCSAG (512, 1200, and 2400 baud), Golay Sequential Code (GSC), NEC 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 (OPTIONAL)

Independent Voice Channels:	14 or 28, each dynamically allocated to trunks on an as-needed basis.
PageSaver Voice Message Retrieval:	72 hours voice storage, 999-second max voice message length, 100 messages per subscriber max. (50 messages per mode), max. message retention time is 255 hours.

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