

Model 66

Transmitter Controller



Features

- Motorola PURC® compatible
- Remote control of multiple paging transmitters provides better area or frequency coverage
- Individual addressing for up to 30 stations (option)
- Simulcast delay module option
- Shared channel “busy” tone indicator
- Positive tone control eliminates stuck transmitters
- Time-out timer protects against excessively long transmissions
- Modem allows remote control for digital paging
- Audio monitor speaker
- Front panel accessible adjustments for audio level, from link (COR) level, and busy tone level
- Remote link transmitter control available
- Low cost of ownership

Introduction

The Zetron Model 66 Transmitter Controller connects to a radio paging transmitter to provide remote control from a central paging terminal. Using positive action tone control methods, the Model 66 recognizes its site address, selects the transmitter modulation mode (analog or digital), keys the paging transmitter, and transmits the paging audio or digital data.

The Model 66 is ideal for wide-area paging systems used for RCC/PCP service, utilities, public safety, and customer owned systems.

The Model 66 is also recommended for in-plant type applications where a single transmitter is located more than 30 feet from the paging terminal. The Model 66 provides electrical isolation which reduces risk of data corruption or damage to the interfaces due to noise. It also reduces the installation costs because only a two-wire interface is needed between the paging terminal and the transmitter location.

System Architecture

Any paging terminal or control equipment that generates the Motorola PURC tones can interface to the Model 66. The Model 66 makes other types of transmitters compatible with Motorola PURC systems. (See Figure 1.)

Model 33 Paging Network Controller

The Zetron Model 33 can be used to interface to paging terminals that don't generate the Motorola PURC tones themselves. (See Figure 2.)

The Model 33 is a device that connects directly to encoders such as the Zetron Models 15, 32, or 64 to provide remote control of the Model 66. Please see the Model 33 specification sheet for more details.

Paging Links

Connections between the central paging control location and the radio paging transmitter sites require only audio grade links. These paging links may be one-way telephone circuits, RF links, or microwave circuits. If the central paging equipment needs to know that a remote transmitter RF channel is in use, then a reverse audio link is required to carry the Model 66 channel busy tone.

Positive Tone Control

The central paging control terminal encodes the paging site address, analog/digital mode, and transmitter key-up information as audio tone information. Through use of the low-level guard tone feature of the Motorola PURC tone protocol, the Model 66 ensures that a transmitter never remains keyed up after a message is transmitted. A guard tone time-out timer protects transmitters that cannot withstand continuous transmission from excessive use. Digital debounce circuitry prevents short audio drop-outs from keying off the transmitter in the middle of a message.

Digital Paging

Alerting binary digital pagers and sending display messages (such as to POCSAG and Golay type pagers) require more sophisticated equipment than does simpler tone+voice paging.

Digital paging data are encoded as audio tones by the central paging terminal and then sent to each paging transmitter. In the Model 66, a built-in Bell 202 modem converts the tones from the paging link back into digital data. Digital outputs from the Model 66 modulate the FSK (frequency shift keying) input of the paging transmitter and changes its modulation between analog (AC) and digital (DC) modes.

Then each paging transmitter must modulate the frequency accurately enough that the pagers can reliably receive the digital data. If any drift in the frequency modulation occurs, the digital data can be corrupted. Therefore the transmitter must handle direct-coupled frequency modulation inputs (not phase modulation inputs).

Site Addressing Options

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 central paging terminal can select each zone in sequence and reach all paging subscribers. With an optional address decoder board, multiple transmitters in a single zone can be addressed.

Transmitter Address Decoder Board Option

The Transmitter Address Decoder board can decode transmitter address tone combinations for up to 30 individual paging transmitter sites.

Dual-Frequency Address Decoder Board Option

The Dual-Frequency Address Decoder board can decode address tone combinations for up to 10 individual paging transmitter sites. It also allows a dual frequency transmitter to key up on one of its two different frequencies.

Shared Channels

Some paging channels are shared for use by co-channel carriers or mobile subscribers. In these systems, it is necessary for the paging sites to notify the central paging terminal when the channel is clear for transmission. The Model 66 converts a COR/CAS signal (such as from a receiver monitoring the frequency) into a tone sent back to the central paging terminal through the modem reverse channel. If the paging terminal cannot process the modem reverse channel, then the Model 55B can be used to buffer the pages at the transmitter site until the channel is clear. Please see the Model 55B specification sheet for additional information.

Simulcast Delay Module Option

Simulcast operation requires the signals transmitted by each transmitter be very close to each other in frequency at all times. To accomplish this, the transmitters are locked to common references or have extremely high stability oscillators and exactly the same audio modulation characteristics. The optional Simulcast Delay Module assures that audio modulation is identical for each transmitter by delaying the audio signals by the amount necessary to compensate for different link propagation paths.

Accurate Delays

The delays are accurate within 5 microseconds and range from 300 to 2,000,000 microseconds in 1-microsecond increments. The delay modules are programmed at the site by laptop PC or over-the-air by DTMF touchtones. In DTMF programming mode each unit is addressable and has a security code to prevent accidental reprogramming by tones on the radio channel. Since accuracy is determined by the quartz crystal oscillator, the delays will not change appreciably with respect to time, temperature or voltage.

Model 66 Link Controller

The Model 66 Link Controller is similar to the Model 66 except that it is used to control remote link transmitters instead of paging transmitters. When the link transmitter cannot be co-located with the Paging Terminal, then a wireline can connect to a Model 66 which controls the link transmitter. (See Figure 3.)

Installation and Maintenance

The rack-mount package, low power consumption, and careful RF-filtered design of the Model 66 make it ideal for mounting in the radio transmitter equipment rack. Modular screw terminal connectors provide compatibility with any cabling system. Front panel level adjustments, indicator lamps, disable switch, and built-in monitor speaker simplify maintenance.

FIGURE 1

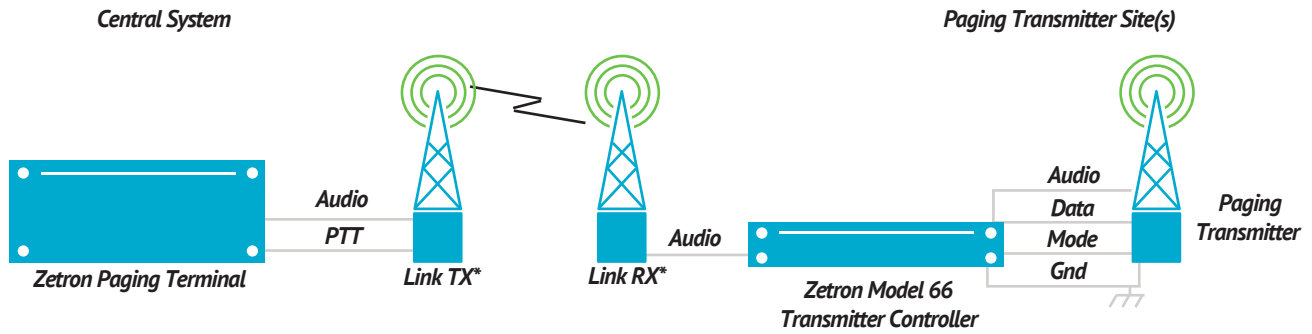


FIGURE 2

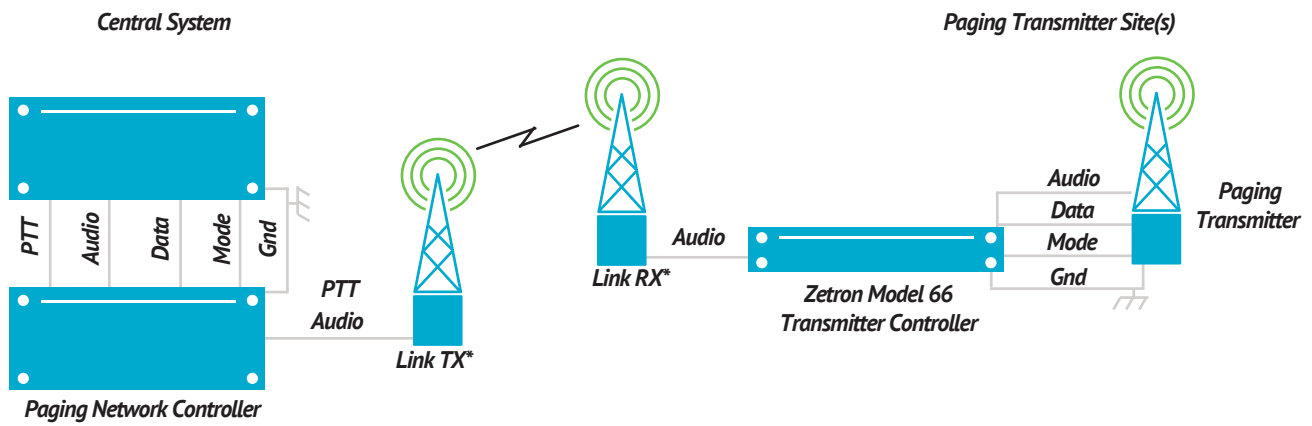


FIGURE 3



* Not required when a wireline is used in place of an RF link

Specifications

General Specifications

Site Addressing: All call (standard)
30-site addressing (option)

Tone Protocol: Motorola PURC® compatible
Dropout prevention

Time-out timer selectable
(1.1, 2.3, 4.5, 9.1 minutes)
Special guard tones available for HSC
paging compatibility

Digital Paging: Built-in 202-type modem

Front Panel Lamps: Power, Audio, Digital, PTT, COR/CAS

Adjustments: TX level, Link in level, Link out level
Accessible from front panel

Link Audio Monitor: Built-in amplified speaker
Adjustable level

Service Switch: Normal, Disable/Reset

Power Requirements: 12-14V DC, 350mA maximum
or 9-12V AC, 350mA maximum
or 120/240 V AC, 50/60 Hz adaptors

Operating Temp.: 30 to 130 degrees Fahrenheit

Size: 1.75"H x 19"W x 6.75"D
Rack-mountable

Weight: 4 lb. maximum

Simulcast delay board

Touch Tone or : Addressable: 00 to 98 Zone / Quiet
RS-232 Control: Control 0 to 9 Universal address:99

Security: 8 character sequences disable and
enable control. Set individually or
universally.

Frequency Range: 56 Hz to 3400 Hz

Delay Range: 300 to 2,000,000 microseconds
in 1 microsecond steps

Gain Range: -6 dB to +6 dB, 0.1 dB steps

Input Impedance: 10K Ohm - Unbalanced

Output Impedance: Low Z - Unbalanced

Nonlinear Distortion: Less than 1%

Noise: Less than -60 dBmC

RS-232 Port: Serial Asynchronous
Full Duplex
8 bit ASCII / 1 Stop bit
No Parity
Baud Rate: 9,600 bps fixed
9 pin D, Female / DCE

Communications: Simple Menu display status of all
parameters.
Select a parameter to be changed.

Environmental: -30° to +60°C, 0 to 95% R.H.

Power J2: +/- 5 VDC, +/- 200 mA max

Weight: 0.6 lb., 0.28 kg

Dimensions: 0.9" H x 3.3" W x 8.8" D
2.29 cm x 8.38 cm x 22.35 cm

Transmitter Interface

Audio Output: Balanced 600-ohm
Adjustable -30 to 0 dBm

Control Relays: 1 Amp rating at 26 V AC
PTT analog SPDT
PTT digital SPDT

Digital Data: Bipolar RS-232
Polarity jumper selectable

Digital Mode: Bipolar RS-232
Polarity jumper selectable

CAS/COR Input: Voltage level or contact closure
0.5V threshold
Polarity jumper selectable

Connector: Detachable screw terminal strip

Link Interface

Audio Input: Paging tones/data, control tones
Balanced 600-ohm
Adjustable -30 to +10 dBm

Audio Output: Channel busy tone (option)
Balanced 600-ohm
Adjustable -20 to 0 dBm

Reverse 202 modem channel

Connector: Detachable screw terminal strip

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ZETRON

ZETRON AMERICAS
PO Box 97004,
Redmond, WA USA
98073-9704
(P) +1 425 820 6363
(F) +1 425 820 7031
(E) zetron@zetron.com

www.zetron.com

ZETRON EMEA
27-29 Campbell Court,
Bramley, Hampshire RG26
5EG, United Kingdom
(P) +44 1256 880663
(F) +44 1256 880491
(E) uk@zetron.com

ZETRON AUSTRALASIA
PO Box 3045, Stafford Mail
Centre, Stafford QLD 4053,
Australia
(P) +61 7 3856 4888
(F) +61 7 3356 6877
(E) au@zetron.com



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005-0231F April 2018