

ZETA ALARM SYSTEMS

EMERGENCY TELEPHONE SYSTEM



INSTRUCTION MANUAL

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System Specification

The Zeta Emergency Telephone System is designed to provide a secure means of communication to manage an emergency situation. Fire telephone systems range from small systems with a handful of outstations to large bespoke systems that incorporate refuge area call points for disabled occupants.

The control panel is normally located at the main entrance of a building for use primarily by the fire officer. The outstations are strategically positioned around the building for use by fire marshals or fire brigade personnel. Using the protected communication link, personnel can assess the emergency situation and implement appropriate action. This is particularly desirable in large buildings where an evacuation needs to be coordinated to prevent stairwells becoming overwhelmed.

The Zeta Emergency Telephone System has a fully addressable bus which can support up to 120 devices any combination of Jack Socket stations, Hands free stations and Telephone stations. Each station is given an address, when a station is in use it will automatically call the main control unit and can be easily identified on the panel display showing the address the call has originated from.

When a call is made from the control unit to one of the outstations, the extension LED will illuminate and the internal speaker will ring (if fitted). The call is answered as soon as the handset is plugged into the socket or the button is pressed on the hands free station.

It is also possible to make and receive calls from up to four stations at the same time.

Features

- Easy to use outstations with simple operating instructions
- Password protected control panel with LCD screen
- Two way fault-monitored voice link with true full duplex speech
- All calls recorded with a playback facility
- Call log for calls made and received
- 24V DC low voltage power supply
- Battery backup with integral battery charger
- Visual and audible - call indications
- With up to 120 addressable outstations connected to one control panel
- Up to 4 outstations can communicate with the control panel at the same time
- Outstations are wired using a 4 wire radial bus.
- Specialised fire-safety intercom system design
- Continuous fault monitoring

Outstations

The system uses a 4 wire digital bus to power and communicate with up to 120 addressable outstations using the Zeta ETS Protocol.

Compatible devices

Device	Comment
ETS-CP/R	Control Panel c/w Red Telephone Handset
ETS-CP/W	Control Panel c/w White Telephone Handset
HF-OS	Type B Hands Free Intercom Outstation for Disabled Refuge use
TS-OS/R	Type A Telephone Outstation c/w Red Handset
TS-OS/W	Type A Telephone Outstation c/w White Handset
TS-OS/WP	Type A Telephone Outstation – Weatherproof Enclosure (IP66)
JS-OS	Jack Socket Outstation

LEDs

The panel indicators are a 24 x 6 backlit LCD screen and seven LEDs as follows:

Indicator Colour	Indicator Function on panel
Green	Power – Power supply is healthy
Amber	Power supply fault – mains or battery fail
Amber	Fault - Will light during any fault (common fault)
Amber	Mute – Will light when microphone is muted.
Red	Call – Will light when ringing and on call.
Amber	Full – Will light when record memory is Full
Green	Recording – Will light when call is recording
LCD	Shows location of calls and description of faults on system

Control Buttons

This panel will use a 16 button keypad and handset hook sensor as follows:

Buttons	Use on Panel
0 – 9	Numeric keys to enter numbers
*	Star – Answer another call during a call
#	Hash – Reset button
ENT / PLAY	Enter – Confirm actions or Play messages
MUTE	Mute – to silence fault speaker and mute handset microphone
UP	Scroll UP to select menu function
DOWN	Scroll DOWN to select menu function / Display the Main Menu
Handset on Hook	Normal - LCD shows time and date
Lift Handset	Panel will request user password (2 2 2 2), then enter the address of the extension to call (0 0 1), then extension will ring and if answered red call LED will light, the call will end when the handset is on hook.

Menu Structure

For menu access, press DOWN key.

MAIN MENU	SUB MENU	DESCRIPTION
1:LED & LCD Test	-	Enter user password (2 2 2 2) and panel indicators will flash 3 times and return to normal screen
2:Record Summary	1:Total Record	View total number of recordings, number of devices in fault and percentage of used memory
	2:Call Log	Shows address of last 6 calls made or received.
3:Playback Recording	-	Select recording number to play
4:Fault Summary	-	View devices reporting fault
5>Delete Recording	-	Enter engineers password (3 3 3 3) and press reset to delete all recordings * Warning unrecoverable *
6:Password Setup	1:User PW Setup	Enter engineers password (3 3 3 3) and enter new user password then enter to confirm
	2:Eng PW Setup	Enter engineers password (3 3 3 3) and enter new engineers password then enter to confirm
7:Configure System	-	Enter engineers password (3 3 3 3) and system will search for devices and display number of phones, hands free and sockets found.
8:Device Summary	- Press ENT for Bus Contents	Panel shows number of telephones, hands free and jack socket devices on system. Bus contents will show all device addresses on the system.
9:Set Date & Time	-	Enter engineers password (3 3 3 3) then enter new date and time, then return to menu.
10:Factory Reset	-	Enter engineers password (3 3 3 3) and press reset to confirm factory reset * Warning unrecoverable *

General Operation

System normal screen

When the telephone handset is on hook the system normal screen will display the Zeta Alarm Systems banner and the date and time.

To make a call

To make a call to a device lift the handset and the system will request the user password (2 2 2 2), then the panel will request the address of extension to call (0 0 1) the extension will ring and if answered the red call LED will light, the call will end when the telephone handset is put back on the hook.

To answer a call

The panel will ring and the red call LED will light, to answer the call lift the handset the red call LED will still be lit during the call, the call will end when the telephone handset is put back on the hook. It is possible for the panel to talk to up to 4 outstations at the same time. Press '*' to answer another call. A missed call message on the screen will inform you of any unanswered calls and the address the call originated.

Detecting faults

If faults are detected the amber fault indicator is illuminated accompanied with a fault tone from the speaker, pressing the mute button will stop the fault tone, the fault relay will operate. The Fault Summary will show details of faults on the system.

Fault	Description
Outstation Removed	If an outstation is removed or has failed, the device address is displayed and panel will beep.
Multiple Outstation Faults	If there is a cable break the first device address will show on the screen and all missing devices will be listed in the fault summary.
Outstation Mic Fault	If a device has an internal microphone fault the message will show device address and MIC fault.
Outstation Speaker Fault	If a device has an internal speaker fault the message will show the device address and SPK fault.

NOTE: Power Faults are monitored with a separate Power Fault LED and Relay, the power faults do not light the FAULT LED or show in the fault summary menu option.

The charger controller board has 4 LED indicators below is a description for the faults monitored:

Power Fault	Description
Green Power LED	The GREEN power LED will be lit normally and flash when mains power has failed.
Battery Fault	The AMBER battery LED will be lit if the Battery is Removed, Low Battery Voltage, Low Battery Capacity
Charger Fault	The AMBER charger LED will be lit if the mains power has failed or the output fuses have blown
Earth Fault	The AMBER earth LED will be lit if there is an earth fault on the system

Buzzer / Speaker

The panel will ring when the panel is called from an outstation.

The fault tone will sound a short beep and can be silenced by pressing the mute button.

The Mute LED will be illuminated when the microphone on the handset is muted.

Address Setting

The panel uses the standard binary style addressing using an 8 way DIP switch settings. Valid addresses are 000 to 119.

Use switches 1 – 7 to set address, switch 8 is not used.



Decimal: 1 2 4 8 16 32 64

For example, a device with switches 1,3 and 6 set to ON (binary 1) and the rest OFF (binary 0) will be address $(1 + 4 + 32) = 37$.

Wiring Configurations

The Outstations

There are three types of outstation available these are:



HF-OS
Hands Free Disabled Refuge Unit



JS-OS
Jack
Socket
Unit



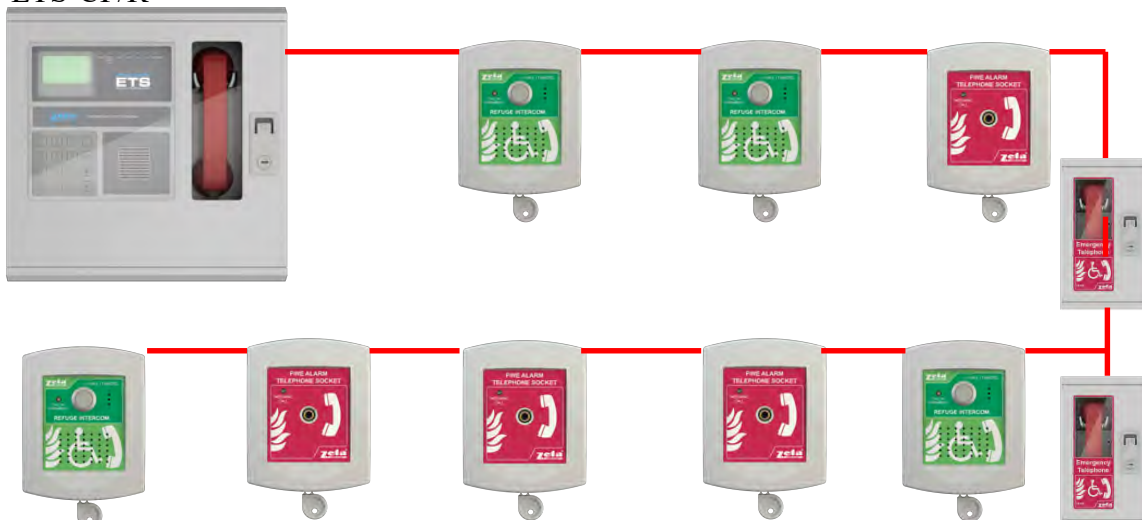
TS-OS/R
Telephone Station



JS-THS
Telephone
Handset
for Jack
Socket
Unit

Drawing showing outstations connected to the main control panel.

ETS-CP/R



The Control Panel

There are four voltage free relay outputs in the control panel these are:

- Power Fault - operates when a power fault is present.
- General Fault - operates when telephone system fault is present.
- Call In - operates when a call is received.
- Call Out - operates when a call is made to an outstation.

The Addressable Bus Connections

The Addressable Bus is a four wire system each wire is numbered 1 to 4 for easy identification. Use of a 4 core cable is recommended.

The Panel Bus connections are 1 to 1, 2 to 2, 3 to 3 and 4 to 4.
Outstations have BUS IN and BUS OUT terminals for easy installation.

The Control Panel Terminal Location.



- Terminal 1 is 24Volts
- Terminal 2 is DATA
- Terminal 3 is 0V (GND)
- Terminal 4 is VOICE

Each Outstation has an 8 Way DIP Switch to set the device address.

Telephone Outstation
Terminals.



Telephone Jack Socket
Terminals.



The Hands Free Outstation Terminals.



BUS Terminals 1-4 IN & OUT

8 Way DIP Switch to set device address.

The Addressable Bus Cable Checks

The Bus cable wiring should be checked with a multi-meter prior to connection to control panel, the typical values measured should be as follows for each conductor:-

Earth Fault Checks

Each wire to earth bar - >500 K Ohms (0.5 M Ohms)

Short Circuit Checks

1 to 2	-	>500 K Ohms
1 to 3	-	>500 K Ohms
1 to 4	-	>500 K Ohms
2 to 3	-	>500 K Ohms
2 to 4	-	>500 K Ohms
3 to 4	-	>500 K Ohms

To make continuity measurements on a radial circuit, temporarily link wires 1 & 3 and 2 & 4 at the last device to take measurements at the panel between:-

1 to 3	-	<50 Ohms
2 to 4	-	<50 Ohms

! Remember to remove links to before connecting the bus wires to the control panel. Damage may result if links are not removed before the bus is powered up.

The measurements of each wire should be the same any significant differences may indicate a cable problem. Record measurements as a reference for future fault finding.

Appendix 1:

The Installation

Installation requirements should conform to the standards BS 5839 part 9.

The control panel should be located at a height comfortable for an average person to use the telephone and easily read information on the screen.

The outstations are strategically positioned around the building for use by fire marshals or fire brigade personnel, for disabled refuge units ensure they have clear instructions and can easily be used by wheelchair users or visually impaired persons.

Do not use hands free intercom style units in areas where noise levels will impair their performance, e.g. from fire alarm sounders fitted in the area, or from traffic noise etc.

The system should be regularly tested for correct operation at regular intervals in line with the fire detection system.

Cable Specifications

The system uses a 4 core cable to connect outstations,. Screened cables should be used throughout the installation to help shield the panel from outside interference and ensure maximum EMC immunity. The use of a fire resistant rated cable is recommended.

There are two categories of cable according to BS5839: Pt1: 2002, Clause 26 “Fire Detection and Alarm Systems for Buildings (Code of Practice for System Design, Installation and Servicing)” and they are:

- ▲ **Standard fire resisting cable – to PH30 classification of EN 50200**
- ▲ **Enhanced fire resisting cable – to PH120 classification of EN 50200**

(Note that all cables should be a minimum of 1mm² cross section)

With an addressable system, some care must be taken when calculating the appropriate cable gauge for the system. The main limitation is the voltage drop due to cable resistance under load, as this can cause interference and loss of data signal. The cable should be segregated from data cables and mains power cables to maximise speech quality.

The exact calculation equations are beyond the scope of this manual, because of the distributed load of the devices on the bus, guide the maximum cable length should be no more than:

1.0mm CSA = 1Km (1000m)

1.5mm CSA = 1Km (1000m)

Technical Information

Enclosure

MATERIAL	-	Steel
DIMENSIONS	-	375 (H) x 380 (W) x 100 (D)
WEIGHT	-	0.00 Kg

Power Supply

INPUT VOLTAGE	-	Mains Supply Voltage 230V AC
INPUT VOLTAGE RANGE	-	88~264 V AC 47~63 Hz
AC INPUT CURRENT	-	1.2A @ 230 V AC
DC OUTPUT VOLTAGE	-	29.5V DC +/- 1% Factory Set
OUTPUT POWER	-	75W, 2.5A @ 30V
DC VOLTAGE RANGE	-	27 – 33V

EN54 Power Supply Controller

OUTPUT FUSES	-	2xT2.5A (5x20mm) Anti-Surge
BATTERY BACKUP (24V)	-	2x12V Batteries in Series
BATTERY TYPE	-	Sealed Lead Acid 12V 3.4 Ah
BATTERY FUSE	-	5 Amp Fast Blow (F5A - 5x20mm)
BATTERY IMP. LEVEL	-	2.0 Ohms Maximum
BATTERY DISCONNECT V	-	20.5 Volts @ Battery, 19V @ PSU

Standby Battery Calculator

ETS PANEL	-	82mA (Standby) 120 mA (In Use)
TELEPHONE OUTSTATION	-	1.0mA (Standby) 4.7mA (In Use)
HANDS FREE OUTSTATION	-	1.1mA (Standby) 4.2mA (In Use)
JACK SOCKET OUTSTATION	-	1.0mA (Standby) 4.2mA (In Use)

In order to calculate the standby battery size, the following formula can be used:-

$$\text{Battery Ah} = 1.25 \times [(\text{TALM} \times \text{IALM}) + (\text{TSBY} \times (\text{IQP} + \text{IQZ}))]$$

Where:

TALM = Time in hours for the system to be in use [typically ½ hour]

IALM = Total Current in amps for 4 active devices.

TSBY = Standby time in hours after mains failure [24, 48 or 72 hr]

IQP = Standby current in amps of control panel during mains failure

IQZ = Total Standby current in amps of all devices on the system.

Typical Example: A control panel with 10 outstations require a 24 hour backup and an additional 0.5 hour duration of in use,

the battery size required would be:-

$$\mathbf{TALM} = 0.5\text{Hrs}, \mathbf{IALM} = 0.12\text{A}, \mathbf{TSBY} = 24\text{Hrs}, \mathbf{IQP} = 0.082\text{A}, \mathbf{IQZ} = 10 \times 0.0011 = \text{A}$$

$$\begin{aligned} \text{Battery Size} &= 1.25 \times (0.5 \times 0.12) + (24 \times (0.082 + 0.011)) \\ &= 1.25 \times 0.06 + 2.232 \\ &= 1.25 \times 2.292 = 2.87\text{Ah} \end{aligned}$$

The calculation includes a battery de-rating factor to allow for a reduction in battery performance as the batteries age. The recommended battery size would be 3.0Ah, the closest available battery size is 3.4Ah.

Single Fault Relay Output Wiring

Normally Open Output – Parallel Wiring

- Link the common contact of the fault relay to the common contact of the power fault relay and this is the common output wire to the auxiliary equipment.
- Link the normally open contact of the fault relay to the normally open of the power fault relay and this is the normally open output wire to the auxiliary equipment.

Normally Closed Output – Series Wiring

- Link the common contact of the fault relay to the normally closed contact of the power fault relay.
- The common contact of the power fault relay is the common output wire to the auxiliary equipment.
- The normally closed contact of the fault relay is the normally closed output wire to the auxiliary equipment.