

DAX
Digital Door Entry System
with
DPX-LED Panel

PD-059 Issue 2

Contents

Introduction	1
Operating Instructions	3
Keypad Operation	3
Conversing with a resident and entering a building	3
Tradesman/Coded Access Facility	4
System Components	8
DPX Door Entrance Panel	8
Diagram 2 DPX Door Panel	9
LM10 Display Module	10
Model 51 Speech Unit	10
DAX Control Cabinet	10
CTX64P Door Controller PCB	10
Diagram 3 DAX Control cabinet internal components	11
EXP64 System Expander PCB	12
RLX8 relay PCB	12
TS2000 Time-Clock Module	12
PSU138B Power Supply	13
Telephones	13
Table 1 Compatible telephone models	13
System Expansion	14
Custom Specifications for the DAX Control Cabinets	14
Other System features	16
Lock Release	16
Egress button / Fireman-s Override switch	16
Tone Output	16
Door Open Indication	17
Cable Planning	18
Important Safety Information	21
Installation	22
Fitting the Control cabinets	22
Fitting the Entrance Panels	23
Fitting the Telephones	23
Testing and Commissioning	24

Turning the system on for the first time.....	24
Testing the Entrance Panel.....	24
System Programming	24
Testing the Telephones	24
Testing the Time-clock.....	25
Testing the system on battery standby	25
Other Tests	25
Display	26
Speech Adjustment.....	26
Programming The Entrance Panels	27
Entering Program Mode.....	27
Changing a parameter	27
Programmable parameters	28
The TS2000 Time-Clock Module	33
Test Mode	36
Using Test Mode from an Entrance Panel	37
Using Test Mode from a Door Controller PCB	37
Diagnostic LEDs	38
Troubleshooting.....	39
Technical Specification	41
Appendix.....	42
Table 4 System Expander DIP switch.....	43
Diagram 4 Entrance Connections	44
Diagram 5 Telephone Connections for Full Isolation Wiring	45
Diagram 6a Telephone Connections for Partial Isolation Wiring (RLX8).....	46
Diagram 6b Telephone Connections for Partial Isolation Wiring (RLXC).....	47
Diagram 7 Connections between DAX Control Cabinets	48
Diagram 8 High Current Lock Releases.....	49
Diagram 9 Keypad Matrix Connections.....	50

Introduction

The DAX Digital Door Entry Telephone System is designed to provide security, by means of Door Access Control, to all forms of communal housing including blocks of flats, apartments, sheltered housing and nursing homes. The System is particularly suited to medium and large sized buildings where a conventional Door Entrance Panel, with individual push-buttons, may be impractical due to its size. The Entrance Panel is designed for ease of use and with a very high level of Vandal Resistance.

The DAX system enables a Visitor to call an individual Resident from a Door Entrance Panel; for the Resident to converse with the caller using a Telephone Handset and, if required, to allow them access to the building by pushing a button to operate an electric door release. The Door Entrance Panel has a simple 13-button keypad for typing the flat number and a clear, large-character, LED display which provides user-friendly messages and instructions.

Access to the building by Residents, Housing Officers, or other Authorised Tradesmen can be achieved with the use of the Trades button. This can operate either with a 4-digit access code or, if required, in conjunction with a Time-Clock for unrestricted access during certain hours.

The DAX System operates on a 'telephone exchange' principle, as opposed to the more usual 'common wiring' approach; Each telephone is isolated by an individual relay circuit, fuse and cable. This ensures that conversations are totally private and that any damage sustained to a telephone or its associated cable will not effect the operation of the rest of the system.

Summary of System Features

- # Connection of up to 256 flats.
- # Operation from up to 4 Entrances.
- # Vandal Resistant Laser-Entrance Panel.
- # Large, 4 Character Dot Matrix LED display providing user-friendly prompts.
- # Flat Numbers of up to 4 digits.
- # Four-digit Coded Access Facility.
- # Trades facility.
- # Isolated Telephone Connections for Privacy of Speech and low maintenance.
- # Battery backup giving uninterrupted operation during power failure.
- # Outputs for Fail-Safe and Fail-Secure lock release mechanisms.
- # Egress facility / Fireman-s Override switch.

Programmable Features

All Parameters listed below are user-programmable and stored in a non-volatile memory.

- # Lock Release duration.
- # Speech connection time.
- # Telephone call time.
- # Access Code (4-digits).
- # Trades button operation; 4 modes
- # Door Open Indication; 2 operating modes and optional delay time

Operating Instructions

Keypad Operation

0-9 Press to Enter a flat number or the numeric part of an alpha-numeric flat number.

CALL Press to buzz the telephone of the displayed flat number.

CANCEL Press to clear the system, and make ready for entry of a Flat Number.

TRADES Press to gain access during permitted time period (a 4-digit access code may be required).

Conversing with a resident and entering a building

Instructions are provided on the entrance panel.

1. Press **ICANCEL@**,

>

Will appear to prompt for a flat number.

2. **Enter the flat number required**

Use the keys **0-9** to enter a number; an incorrect flat number can be cleared by pressing **CANCEL**.

3. Press **ICALL@** to buzz the resident's phone.

CALL

will appear to indicate that the telephone is being buzzed.

followed by:

NNNN

Indicates that a two-way conversation is possible as soon as the resident picks up the handset.

WAIT

Indicates the resident's phone is engaged, wait a short time and then press **CALL** again.

ERR

Indicates that an incorrect flat number was entered, press **CANCEL** and start again.

4. Press **CALL** again, if required, to draw the resident's attention.
5. During speech the resident can press the **telephone lock button** at any time to operate the electric lock release and allow entry.

OPEN

Appears for a few seconds during which time the caller may enter.

Tradesman/Coded Access Facility

1. Press **ATRADES@**.

DENY

Indicates access is disabled at the time attempted.

OPEN

Indicates that the tradesman may enter immediately without an access code.

CODE

Prompts the use for a 4 digit access code.

2. Enter the required 4 digit access code

An * will be displayed for each digit entered. Press **CANCEL** to clear a mistake:

DENY

Indicates that an incorrect code was entered, press **TRADES** to try again.

OPEN

Appears for a few seconds, indicating that the code has been accepted; the caller may enter during this time.

For each of the two states (ON or OFF) set by a Time-Clock, the system may be programmed to allow any one of the following 1: no access, 2: immediate access, or 3: coded access.

Multi-entrance Operation

A DAX system may have up to four Entrance Panels. The operation from each of these is exactly as described above, however, only one Resident, within a bank of 64 flats, may be called at a time. If a call is made from one Entrance, the other Entrance(s) will display >WAIT= if an attempt is made to make a call from them.

On a system with more than one Control Cabinet (i.e. with more than 64 flats) simultaneous calls are possible, providing both Entrances are calling telephones within their local Control Cabinets; i.e. as soon as a call is made from an entrance of one Control Cabinet to a telephone of another, all other Entrances/Telephones within those two Control Cabinets will be engaged.

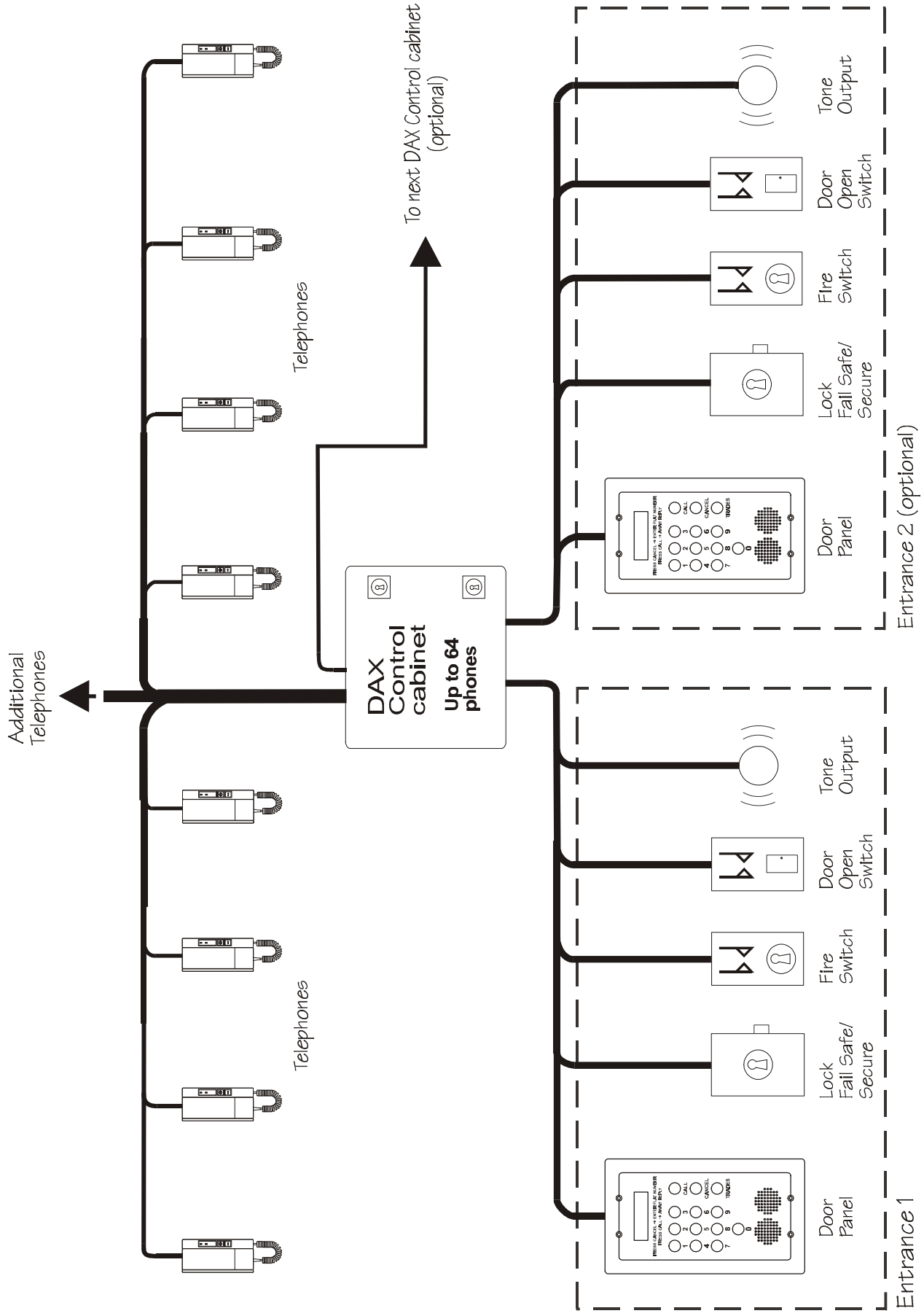


Diagram 1 System Components

System Components

A DAX Digital Door Entry System comprises the following components:

- **DPX Entrance Panels** - one per door; each including a **LM10 LCD Display Module** (Liquid Crystal Display), and a **Model 61 Speech Unit**.
- **DAX Control Cabinets** - each complete with a Power Supply (with optional battery standby), a Time-Clock, and all necessary control electronics to connect up to 2 entrances and 64 flats. Additional Control cabinets are needed for further flats and/or entrances.
- **Model 500X Telephones** (or various other models) - one required per flat
- **An Electric Lock Release** - various types

DPX Door Entrance Panel

The DPX Door Entrance panel is of a flush-mounting, vandal resistant design. The panel and surrounding bezel are laser cut from a single piece of 316 marine grade 2.5mm stainless steel; this allows for a gap of only 0.2mm, rejecting tools that could be used to force the panel from its back-box. The bezel is welded to an integral back-box made from 1.5mm 316 marine grade stainless steel.

The layout of the DPX panel is illustrated in Diagram 2 overleaf, which shows the following features:-

- A large transparent window manufactured from LEXAN or an equivalent material which has an extremely high impact resistance.
- A keypad comprising of 13 Vandal resistant Stainless Steel buttons.
- A speech grill comprising of a decorative pattern of closely-spaced 2.5mm holes.
- Clear Operating Instructions, laser engraved in black.

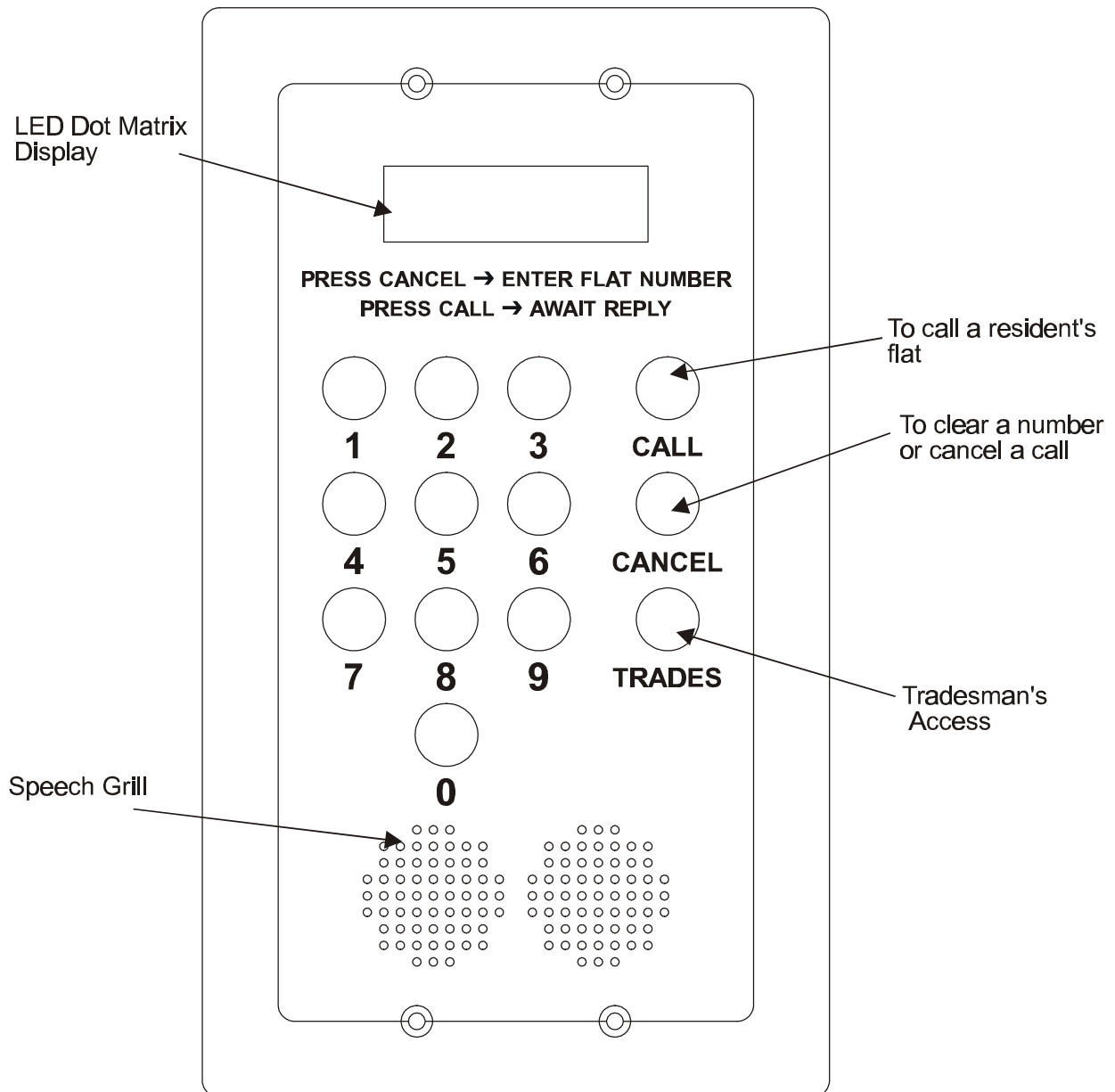


Diagram 2 DPX-LED Door Panel

LM10 Display Module

The LM10 Display Module is an environmentally protected unit, manufactured with Zinc Passivated steel to BS1449 and including a secondary protective window. The Display module has a 4-character Dot Matrix LED Display and an 17mm character height, giving excellent visibility in a variety of lighting conditions, including night-time.

Model 61 Speech Unit

The Model 61 Speech Unit, positioned behind the grill of the DPX Door Entrance Panel, provides two-way speech communication between the door panel and telephone. It has a plastic cone loudspeaker and Electret microphone, which provide excellent weather resistance. Both amplifier circuits use a custom designed hybrid circuit for high reliability. There are two controls at the rear for adjustment of speech volume levels.

DAX Control Cabinet

All of the DAX control equipment is installed in one or more IP55, lockable, steel cabinets.

The internal layout of the DAX Control Cabinets is illustrated in Diagram 3 overleaf and contains one or more of the following components:

- CTX64P Door Controller PCB
- EXP64 Expander PCB
- RLX8 Relay PCBs
- TS2000 Time-Clock
- Model CAB5 Power Supply Unit.
- Optional Lead-Acid battery (6AH)

CTX64P Door Controller PCB

The Door Controller PCB provides all the necessary connections for interfacing to one DPX Door Entrance Panel, as well as connections to the Electric Lock Release and optional Fireman's Switch, Sounder or Door Monitor Switch. One or two Door Controller PCBs are fitted in each Control cabinet. If two are present, they will be arranged in piggyback fashion, staggered to allow access to the connection terminals. The bottom PCB always has the lower door address / number.

The upper PCB will reveal a slide switch (marked RUN-PROG) which is provided to enable programming of various system parameters. (refer to >Programming the Entrance Panels<).

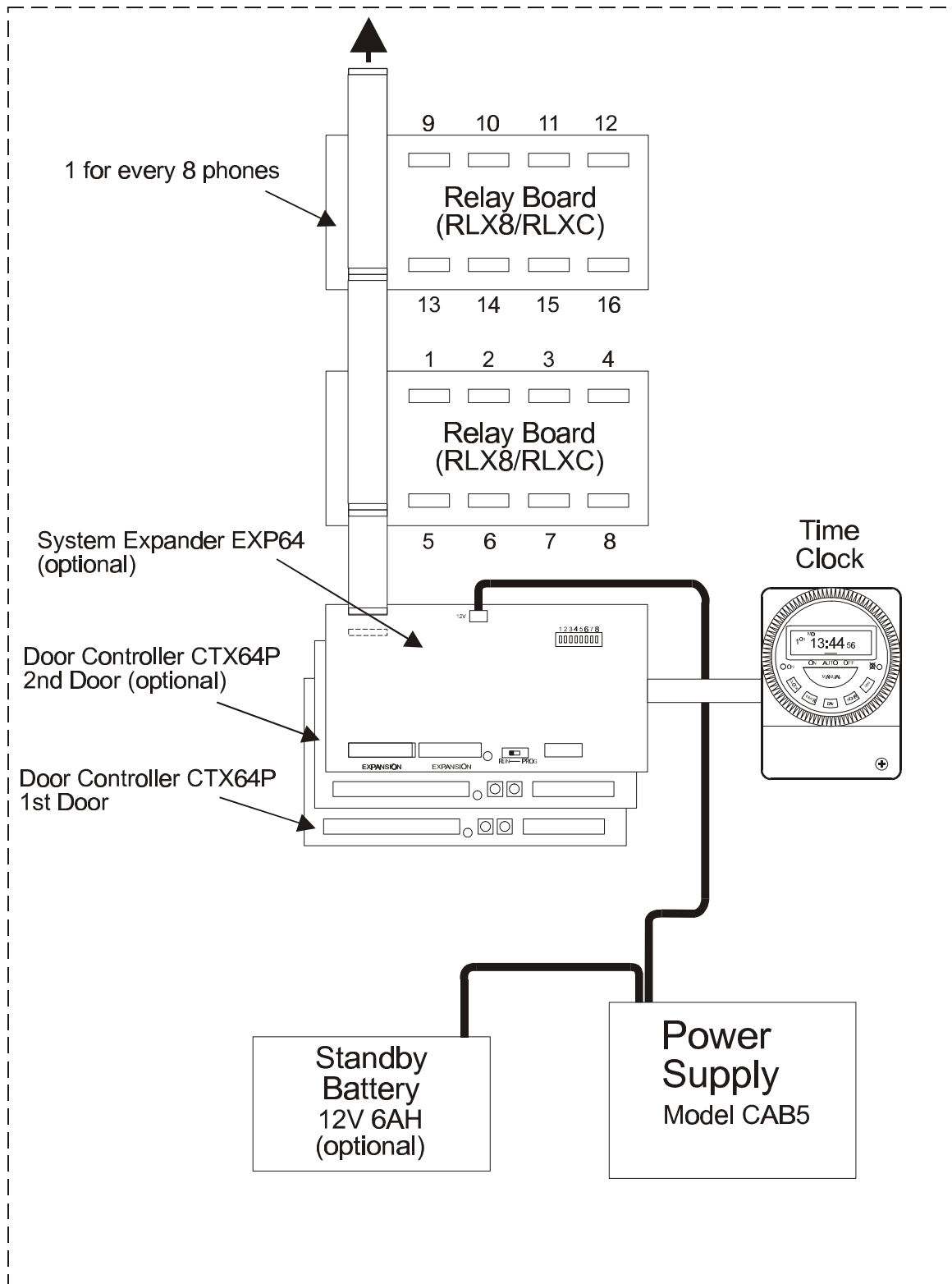


Diagram 3 DAX Control cabinet internal components

EXP64 System Expander PCB

An EXP64 System Expander PCB is required when there is more than 64 flats or more than two entrances per system. It provides the necessary interconnections to additional DAX Control Cabinets. The Expander PCB is always positioned on top of the CTX64P door controller PCBs (a Control Cabinet, provided purely for telephone expansion, may have a single EXP64 PCB and no CTX64P door controllers).

RLX8 relay PCB

Each RLX8 Relay PCB provides connections to eight telephones. There will be a maximum of eight RLX8 boards per cabinet allowing connection of up to 64 telephones. These will be clearly labelled 1 to (up to) 64. An LED is provided for each telephone which illuminates whenever that telephone is called.

The RLX8 PCBs provide complete isolation between telephones by means of relays and fuses. This ensures that any cable or equipment fault affecting one telephone will not impair operation of any other telephone within the system. To maintain full isolation a separate cable is required for each telephone. An alternative reduced wiring system is possible whereby a single cable is used for each relay board thus reducing the number of cables by a factor of eight; in this case isolation is maintained between RLX8 boards, so that a single fault can affect only a group of eight telephones.

TS2000 Time-Clock Module

The TS2000 Time-clock module is used to set time-periods when the >TRADES= button is operative. It is programmable with up to 8 flexible on/off settings in a 24 hour or 7 day period. The TS2000 module has its own battery, allowing retention of the program during power failure.

Normally there is only one TS2000 module supplied per system. However it is possible to provide one TS2000 for each CTX64P Door Controller, should the time requirements for each Entrance be different.

CAB5 Power Supply

Each cabinet is separately power by an internal 12V DC Regulated Power Supply Unit Model CAB5. Battery Standby operation is possible with an optional 6AH, maintenance-free Lead-Acid battery. The PSU operates in 'Floating Charge' mode whereby the battery is connected directly across the power supply output. It has an active short-circuit protection for mains operation and fast blow fuse protection for battery operation.

An integral Two-Pole Mains Switch is provided to enable all other Cabinet components to be isolated from the Mains Supply during servicing. This Illuminated switch, together with red and green LED lamps, provide a clear indication of the Power Supply, Mains and Battery Status.

Telephones

The following models of telephones are suitable for the DAX Digital Door Entry System, having the facilities as indicated.

Table 1 Compatible telephone models

Model	Buzzer mute	Buzzer mute indicator	Timed buzzer mute	Door open indicator
801/801P*	✗	✗	✗	✗
801S/801PS*	✓	✗	✗	✗
500D/500PD*	✗ □	✗	✗	✗
500X/500PX	✓	✓	✗	✗
500LX/500PLX*	✓	✓	✗	✓
500LXT/500PLXT*	✓	✓	✓ □	✓ □

On a **Fully Isolated System** (see Cable Planning, Page 18), the use of Privacy Telephones is unnecessary as 'privacy of speech' is inherent, due to the line isolation. Privacy telephones are recommended, however, when using the (partially isolated) **Reduced Wiring** system, to avoid the problems arising from Telephones being left off the hook.

System Expansion

A Control Cabinet is limited to a maximum of 64 telephone connections and two entrances. For larger systems additional Control Cabinets are required, each provided up to a further 64 telephone connections and up to a further two entrances. An expansion Cabinet may contain additional Relay boards (telephone connections) only, or additional Door Controllers only, or a combination of both.

Custom Specifications for the DAX Control Cabinets

Number of flats per Control Cabinet

Each control Cabinet is fitted with a number of RLX8 Relay boards giving multiples of 8 telephone connections up to a maximum of 64. Unless otherwise specified, each Cabinet will be filled with 8 Relay boards (64 flats) until the required number of flats is achieved. Control Cabinets can be supplied with a lesser numbers of Relay Boards to suit the layout of the building and the cables. However, as each control cabinet must have its own Power Supply Unit and Expander PCB, this will be a more costly option to the Customer.

Distribution of Door Controllers between Cabinets

Each Control Cabinet is fitted with 0, 1 or 2 Entrances (0 indicates an extension cabinet for extra telephones only).

By default, Door Controller PCBs 1&2 will be placed in Cabinet 1, and Door Controller PCBs 3 & 4 in Cabinet 2. In some cases the Customer may find advantage in a non-standard configuration: For example, on a 2-Door 128-way system; by placing Door Controller 1 in Cabinet 1, and Door Controller 2 in Cabinet 2, simultaneous operation from both Entrances is possible providing that the call from each Entrance is made to a telephone which is connected within the same Control Cabinet as the Door Controller.

Time-clock Modules

Standard systems are supplied with one TS2000 Time-clock module in Cabinet 1. If required, additional TS2000 modules can be supplied (up to 1 per Entrance) so that each Entrance or group of Entrances can operate with different time settings when using the Trades facility.

Selection of Flat Numbers

For each telephone the Customer may specify any 1 to 4 digit number flat number. E.g. 7, 101, 2018. The required numbering system is factory programmed and therefore must be provided by the customer at the time of order. These numbers maybe presented in an entirely random sequence so that the telephone connections maybe conveniently allocated between relay boards and between cabinets to simplify cable runs.

A printed form is available to assist in the presentation of the flat numbering scheme by the Customer.

A document entitled »DAX Door Entry System Configuration Summary« is provided with each Control Cabinet showing the pre-programmed flat numbers and their corresponding telephone wiring locations.

Other System features

Lock Release

Each Door Controller PCB (CTX64P) provides two alternative pairs of connections for Electric Lock Releases:

FAIL SECR: for devices that require power to release the lock and will secure the door in the event of power failure. These are the most commonly used lock releases.

FAIL SAFE: for devices requiring continuous power to lock the door and release during power failure, includes magnetic locks.

Both Outputs are rated at 12V DC at a maximum current consumption of 0.5A. For a lock release or magnetic lock with higher rating or for AC operation, an additional Power Supply will be required. In addition a relay must be used to interface with the CTX64P Door Controller PCB. This is illustrated in diagram 8.

Egress button / Fireman's Override switch.

Each CTX64P Door Controller PCB has a pair of connections marked EXIT which may be wired to an external push-button for egress operation. Momentarily operating this button will directly operate the lock release for the programmed duration.

Alternatively the input may be used with a Fireman's Override Key-switch. Closure of this switch will operate the lock release continuously; if this feature is used it is important therefore that the lock release be of a continuously rated type.

A normally-open switch or push-button with isolated (i.e. voltage-free) contacts is required.

The Egress/ Fireman's facility can operate the lock release for extended periods and requires a continuously rated lock release.

Tone Output

This output operates, during lock release operation (except Egress / Fireman's facility) or when a telephone is called. This is normally used to alert the caller, with a DC sounder placed in or near the door panel.

Two connections are required to the Door Controller PCB, marked >TONE= and rated at 12V DC 100mA maximum. Positive connection is on the left.

Door Open Indication.

This feature requires the use of Model 500LX, 500LXT, 500PLX or 500PLXT Telephones. If a door is left open, this will be indicated on the green LED of the Telephones. The LED may be programmed to be steady or flashing, and to operate immediately, or after a delay.

On a multi-door system the Door Open Indication can be set to operate in either of two conditions:-

- i) Any Door within the entire system is open.
- ii) Any Door connected to the same Control Cabinet as the Telephone is open.

Each CTX64P Door Controller PCB has a pair of connections labelled >DOOR SW=. These connections must be wired to a magnetic door-switch or the contacts of a Lock Release Monitor switch. Either normally-open or normally-closed switches may be used.

Cable Planning

Use 0.5mm solid-core twisted-pair telephone cable (BT specification CW1308, or equivalent) for all telephone and door panel connections; this is essential for correct operation of the system and for compliance with European EMC Directive 89/336/EEC. Avoid running any cables alongside mains or other data transmission wiring.

Twisted-Pairs

Twisted-pair telephone cable consists of several insulated conductors, arranged in pairs and lightly twisted together, and with an overall outer sheath. Normally the pairs are identified by a common colour e.g. blue on white/white on blue. A twisted-pair offers an improved immunity to pickup of noise, and a reduced emission of noise.

The following pairs of connections should each use a single twisted-pair

- | | | |
|-------------------------|---|--------------------------------|
| >R= and >O= connections | - | Speech Unit to Door Controller |
| | - | Telephone to Relay Board. |

- | | | |
|--------------------------|---|-----------------------------------|
| >OV= and >D= connections | - | Display Module to Door Controller |
|--------------------------|---|-----------------------------------|

- | | | |
|-------------------------|---|------------------------------------|
| >S= and >S= connections | - | System Expander to System Expander |
|-------------------------|---|------------------------------------|

- | | | |
|-------------------------|---|------------------------------------|
| >R= and >T= connections | - | System Expander to System Expander |
|-------------------------|---|------------------------------------|

The Display Module >OV= wire should only be connected between display module and Door Controller and not used as a return for another part of the system.

Cabling systems to Telephones

Full Isolation

In order to provide full isolation between telephones, each telephone must use a separate cable. This is shown in Diagram 5.

Partial Isolation, Reduced Wiring

Diagram 6 shows an alternative wiring system which reduces the number of cables between the Telephones and Control Cabinets. The common cables of 8 telephones, together with 8 individual call lines, are looped from phone to phone and then connected to a single relay board. Isolation is maintained between relay boards, so that a fault on any telephone or associated cable can affect only seven other telephones.

Table 2 Cable connections

Connections to each Door Controller (CTX64P PCB)	Cores	Diameter	Max.Length
Speech Unit (Door panel)	5	0.5mm	50m
Keypad (Door panel)	8	0.5mm	50m
Display Module (Door Panel)	3	0.5mm 2 x 0.5mm	25m 50m**
Lock release (0.5A rating)	2	0.5mm 1.0mm	25m 100m
Exit / Fireman's Switch or Door Open Switch	2	0.5mm	100m
Tone Output / Sounder	2	0.5mm	100m
Engage Lamp	2	0.5mm	100m
Connections to Telephones (full isolation)			
801/801S/500D Telephone	5	0.5mm	100m*
500X Telephone	6	0.5mm	100m*
500LX/500LXT Telephone	7	0.5mm	100m*
Connections to Telephones (partial isolation)			
801/801S/500D telephone	4+8	see table 3	
500X Telephone	5+8	see table 3	
500LX/500LXT Telephone	6+8	see table 3	
Connection between Control Cabinets (EXP64 PCBs)	6	0.5mm	100m*

These restrictions are unlikely to be exceeded in most circumstances; if they present a problem please contact the Manufacturer for further advice.

* For systems with several Control Cabinets, the distance of each telephone added to the distance of its Cabinet from the most remote Cabinet should not exceed 100m.

** There are 3 connections, but 2 require the cores to be doubled up.

Table 3 Partial Isolation Telephone Connection Distances

Core Diameter		Maximum Length		
V, O, L	R, T, Z, I	500LX/LXT or PLX/PLXT	500X or PX	801/801S/500D
0.5mm	0.5mm	40m	100m	100m
1.0mm	0.5mm	80m	100m	100m
1.2mm	0.5mm	100m	100m	100m

Important Safety Information

Connections to the 240V AC mains supply must be carried out by a qualified electrician or similar competent person, and made in accordance with accepted safety practices. A two-pole switch (as provided by a Consumer Unit or Switch-Fuse) must be included to isolate both Live and Neutral during Installation or Maintenance. The circuit must be protected by a fuse or other current-limiting device, rated according to the capacity of the cable used, up to a maximum of 10A. Use only mains cable to BS6004 or equivalent, within the following specified limits:

	Min	Max
Conductor Diameter	1.0mm (0.8mm ²)	2.25mm (4mm ²)
Cable Diameter	4.0mm	8.0mm

The power supply is fitted with an integral mains fuse and battery fuse; always replace with the correct type and rating. The fuse must be of the 20mm glass type, approved to BS EN 60127 or equivalent.

Environment

The Control Cabinets must be placed in a protected indoor environment and not exposed to dripping or splashing. The Cabinet(s) must be secured to the wall with adequate fixings so that there is no possibility of it falling down.

Lead-Acid Battery (when supplied)

The Lead-Acid Battery for the Standby Power Supply is shipped in separate packaging. Care must be taken to ensure that the terminals of the battery are not shorted together by metal objects as this may constitute a Fire Hazard. The Control Cabinet is IP55 rated (to exclude dust) and is vented to avoid the build-up of gases. Do not block any vents which may be apparent.

Installation

Installing the cables

Before Installing any cables study the wiring diagrams, and read thoroughly the sections on 'cable planning', and the notes on equipment installation described below. The entire system of cables may then be installed in the building ready for fitting of the equipment.

Fitting the Control cabinets

The control cabinets are designed to be wall-mounted in a protected indoor environment such as an Electrical Cupboard. Position them within the building in such a way as to minimise the length of cable runs to the telephones and Entrance Panels. Ensure that there is a 240VAC mains supply available (via a Switch-Fuse or Consumer unit) and that there is easy access for maintenance.

Four holes are provided at the back of the cabinet for mounting to a vertical wall; ensure that the correct fixings are used for the type and construction of the wall; test the strength of the fixings before connecting the mains supply. Cable access is provided at the top with a removable plate. For drilling of cable clearance holes or conduit fittings, remove this plate from the equipment, to avoid metal particles from falling onto equipment.

Connect all signal cables according to diagram 4 in the appendix, observing the twisted pairs as described in the section 'Cable-Planning'. The cable for each telephone must be connected to the correct output of the RLX8 relay boards in the Control Cabinet, to enable it to operate from the required flat number. The RLX8 connections are labelled 1 to 64. The corresponding flat number is given on the 'DAX Door Entry System Configuration Summary' supplied. **If Partial Isolation telephone wiring is used with 500X series telephones (refer to page 18) each RLX8 PCB must have fuse FS1 replaced with a F1.5A Quickblow type.**

A 240VAC mains connection is required to the Power Supply. It is advisable to use a plastic conduit to protect the mains cable within the cabinet. To make the connections, remove the PSU lid by removing the fixing screws. Feed the cable through the grommet and cable-clamp and connect the Live, Neutral and Earth Connections as marked. Refit the PSU lid. Do not connect the battery at this stage.

Fitting the Entrance Panels

Choose a position on the wall of the building as close as possible to the entrance, which allows easy access for cables. If possible, avoid an open, south-facing aspect for optimum visibility of the display throughout the day (ie avoiding direct sunlight). As a guide, mount the panel so that the display window is approx. 1.6m above ground level.

Cut a hole in the wall slightly larger than the back-box but a clear margin smaller than the panel ; ensure there is a sufficient clearance for the cables if they are to exit from the top or bottom.

Extract the main panel from the back-box by removing the two vandal resistant bolts (a special key is provided) and place it where it is protected from damage. Secure the back-box to the wall with four heavy-duty fixing screws. Make sure there are no large gaps between the wall and the panel . Feed in the necessary cables through holes in the back, top or bottom of the back-box and make all connections in accordance with wiring diagram 4 in the appendix.

Before refitting the Entrance Panel ensure the Model 61 Speech Unit is correctly positioned and check (and adjust if necessary) the two volume controls are approx. mid-way. Finally refit the Panel and remove the protective film from the display window.

Fitting the Telephones

All the Models of Door Entry Telephone described above, are designed to be Wall-Mounted. Position them approx. 1.5m from floor level. Make a cavity in the wall and feed through the required cable. Remove the lid of the telephone by pulling it straight off. The cable should be fed through the access hole in the base of the telephone and the telephone secured to the wall with two fixing screws. Strip the cable to length and connect according to diagram 5 or 6 in the appendix. Refit the lid and then hang-up the handset ready for testing.

Testing and Commissioning

Turning the system on for the first time

Switch on each control Cabinet in turn, performing basic checks before moving on to the next:

With the battery still disconnected, switch on the mains supply and then turn on the Power Supply. The Power Supply ON/OFF switch should illuminate to indicate a health mains supply and a steady green Lamp will confirm correct operation of the PSU. As soon as power is applied, a Red LED will flash four times on the CTX64P Control Board (or EXP64 if present), again confirming correct operation. In the event of any difficulties refer to the section on troubleshooting.

Testing the Entrance Panel

Visit each Entrance Panel in turn and confirm operation of the LED display by entering any flat number and then pressing cancel (refer to Operation page 3). If there is nothing displayed or there are unexpected messages, refer to the section on Troubleshooting.

System Programming

A number of system settings (e.g. lock duration, access code) may be customised during Installation; refer to the section on 'Programming the Entrance Panel'. It is advisable to program all Entrances to the required operation, at this stage, to avoid repeating the following tests.

Testing the Telephones

Refer to the Operating Instructions page 3; Two Engineers are required to perform these tests. Alternatively, use Test Mode: Page 36.

Work systematically through the flat numbers from the Printouts provided following the sequence of Relay numbers (1 to 64 on the RLX8 PCBs).

Call the first telephone checking that the telephone buzzer is audible and that two-way speech is possible and of good quality. Press the telephone lock button and check the lock release operates.

If the telephone is a 500X, 500 LX, 500LXT, 500PX, 500PLX or 500PLXT model, press the mute switch and check the red LED turns on and off.

If the telephone has a Door Open Indicator, open the door and check the LED illuminates or flashes.

Testing the Time-clock

Program the required time-periods for Trades operation by referring to the section >The TS2000 Time-Clock Module=.

Testing the system on battery standby

(read the section on >Important Safety Information=)

When all system tests are completed, the Lead-Acid battery (if required) may be installed in each Control cabinet. The battery is placed on the bottom of the Cabinet and connected by two leads with spade terminals to the CAB5 Power Supply. Observe the correct polarity (red to positive; black to negative). The PSU should remain operating with a steady green lamp.

Now simulate a Mains failure by switching the PSU off (the switch should cease to illuminate). Battery operation should be confirmed with a flashing green lamp on the PSU. Confirm that the system continues to operate normally, by re-testing the system from one telephone. Re-instate the Mains.

Other Tests

The following additional tests should be performed to verify correct operation and programming of each facility if used on the system:

- | | |
|-----------------------------|--|
| Door Monitor: | Check that the Door Open Indicator on the telephones operate from the required doors. |
| Egress Button: | Check that pressing this button operates the Lock release for the prescribed period of time. |
| Firemans switch: | Check that operating this switch will release the door until the switch is turned off again. |
| Trades/Coded Access: | Check that these features operate exactly as programmed; if required the time-clocks can be switched on or off manually to simulate the active time-periods. |

Display

If the display window in the module itself, or at the entrance panel, requires cleaning use a mild detergent and NOT an abrasive cleaner.

Speech Adjustment

The Model 61 Speech Unit has two pots at the rear for adjustment of Speech levels as follows:

Volume A: Speech level heard at the Entrance Panel
Volume B: Speech level heard at the Telephone

If feedback is experienced (a howl or a whistle) turn both controls to >off= and slowly adjust each up in turn until a satisfactory level of speech is attained.

Programming The Entrance Panels

Entering Program Mode

- Set the **PROG/RUN switch** on any Door Controller or System Expander PCB to **PROG**; The Displays shows

PGM

- Enter the security code: **1010** (this protects against inadvertent use by a Caller).
- All other entrances will show

PGM

After 3 minutes of no activity this entrance will return to the same prompt.

Selecting a Parameter

- On entering Program Mode, the first parameter is displayed. Alternating between the parameter number and the current value / setting.

P1

↔

1234

- To step through to the required parameter press the >TRADES= button. Pressing the >TRADES=button after the last parameter will return to the first.

Changing a parameter

- If the Parameter has a numeric value, type the new value using the keys **0-9** and press the **CALL** button. If an incorrect value is entered press **CANCEL** to return to the previous value and then re-enter before pressing the **CALL** button. If a value is out of the allowable range the parameter will remain unchanged.
- If the Parameter has an option list or yes/no setting, toggle through the settings with the **CALL** button.

Programmable parameters

Parameter 1 - Trades code

Display: ↔

Range: Any 4 digit code.

Default: 1234

Description: The code to enter a premises when the trades button is pressed to use the coded access function. Requires parameter 5 and / or 6 set to ACODE@ to enable this function.

Parameter 2 - Lock release time

Display: ↔

Range: 1- 20 seconds

Default: 5 seconds

Description: The time a lock release operates or continues to operate after a telephone lock button has been pressed, trades/coded access was used or the egress / fireman's switch was operated.

Parameter 3 - Speech time

Display: ↔

Range: 20 - 240 seconds

Default: 60 seconds

Description: The time for which two-way conversation is possible between Resident and Caller before the system automatically disconnects the line. During Test Mode this time is extended to 10 minutes.

Parameter 4 - Phone Buzz timeDisplay: ↔

Range: 0 - 10 seconds

Default: 0 seconds

Description: The time a telephone buzzer sounds after the caller has released the CALL or PORTER buttons to make a call.

Parameter 5 - Timer on accessDisplay: ↔

Range: NO, IMM, CODE

NO No access
IMM Immediate access, no code required.
CODE Code required.

Default: NO

Description: Action required when the TRADES button is pressed whilst the Time-Clock module is ON.

Parameter 6 - Timer off accessDisplay: ↔

Range: NO, IMM, CODE

NO No access
IMM Immediate access, no code required.
CODE Code required.

Default: NO

Description: Action required when the TRADES button is pressed whilst the Time-Clock module is OFF.

Parameter 7- This is reserved

Parameter 8 - Door Switch Type

Display: ↔

Range: N/C or N/O

N/C Switch closed when the door is closed.
N/O Switch open when the door is closed.

Default: N/C

Description: Type of door switch used to indicate a door is open.

Parameter 9 - Door open delay

Display: ↔

Range: 0 - 240 seconds

Default: 0 seconds

Description: Delay time between the door first opening and a >DOOR OPEN= LED illuminating on the telephone.

Parameter 10 - Door open indication

Display: ↔

Range: YES/NO

Default: NO

Description: Dictates whether the telephone >DOOR OPEN= LED Indicator is flashing or continuous when active.

Parameter 11 - Door number

Note: This parameter is factory set and should not need adjusting. Incorrect setting may result in temporary loss of system operation, or partial operation.

Display:

P11

 ↔

1

Range: 1 - 32

Default: System dependant

Description: Address of the Door Controller currently being Programmed.

One controller in the system must have an address of 1. The address of each must be unique and cannot be the same as a System Expander phone bank address.

Parameter 12 - Maximum address

Note: This parameter is factory set and should not need adjusting. Incorrect setting may result in temporary loss of system operation, or partial operation.

Display:

P12

 ↔

2

Range: 1 - 32

Default: System dependant

Description: The highest address used by any Door Controller or System Expander in a system. This must be set to the same value for every entrance.

Parameter 13 - Timer door number

Note: This parameter is factory set and should not need adjusting.

Display:

P13

 ↔

1

Range: 1 - 32

Default: 1

Description: The address of the Door Controller, which has the required time clock directly connected.

Parameter 14 - System Expander Address

Note: This parameter is factory set and should not need adjusting.

Display:

P14

 ↔

3

Range: 2 - 32

Default: System dependant

Description: The address of the System Expander (EXP64 PCB), or phone bank, directly connected (in the same cabinet) to this entrances' Door Controller (CTX64P PCB). If no System Expander is present, this variable can be ignored.

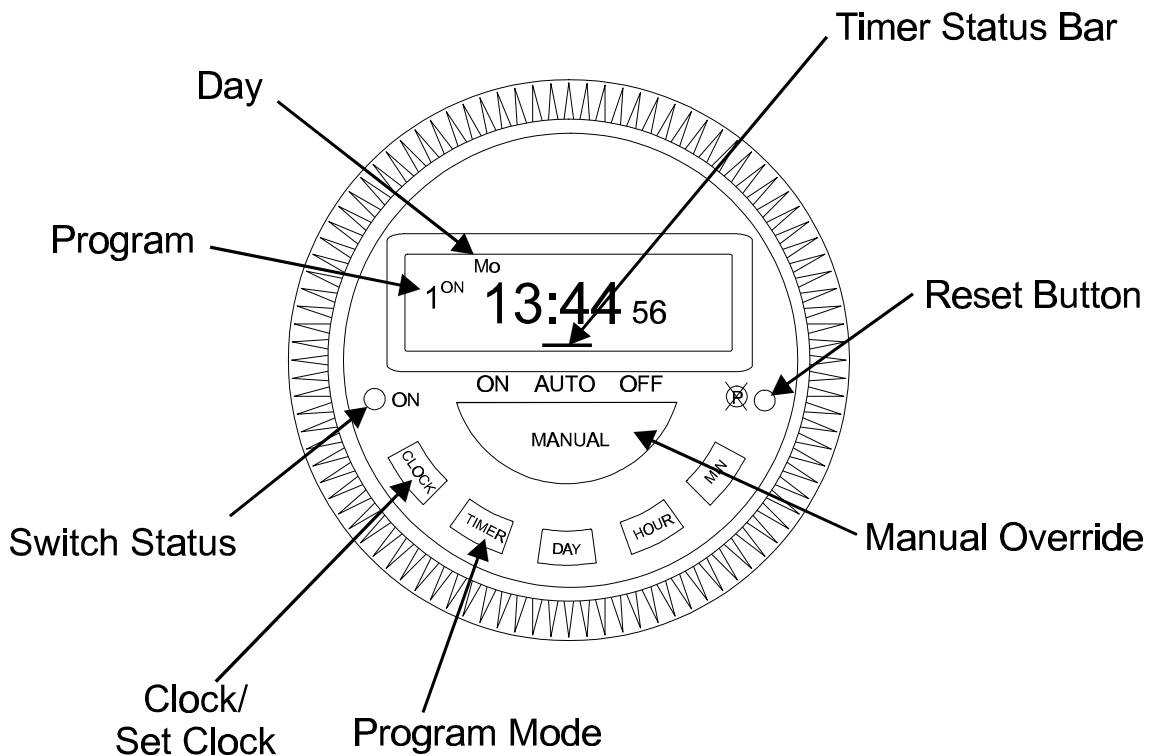
The TS2000 Time-Clock Module

This section describes the operation and programming of the TS2000 Time Clock module for use with the Tradesman’s facility.

CAUTION







The unit is intended for 12V AC / DC operation only, and must not be connected to the Mains supply or used to switch Mains voltages.

Operation





N.B. Before programming or setting the clock for the 1st time press the RESET button.

To set the current TIME and DAY:

1. Hold  and press  until the correct day is displayed.
2. Hold  and press  until the correct hour is displayed.
3. Hold  and press  until the correct minutes are displayed.




To set the programs:

1. Press  once, 1^{on} will appear. This displays the switch on time of the 1st program.


2. Press  to select the program period. There are 15 settings:

Mo+Tu+We+Th+Fr+Sa+Su
 Mo, Tu, We, Th, Fr, Sa, or Su
 Mo+Tu+We+Th+Fr
 Sa+Su
 Mo+Tu+We+Th+Fr+Sa


Mo+We+Fr
 Tu+Th+Sa
 Mo+Tu+We
 Th+Fr+Sa

3. Press  to select the hour.
4. Press  to select the minutes.
5. Press  once, 1^{off} will appear. This displays the switch off time of the 1st program.
6. Repeat steps 2,3 and 4 to set the off day and time.
7. Repeat steps 1 to 6 to set the 2nd, and remaining programs, as necessary.

Reviewing the programs:

Press  each time to toggle through the 8 on and off settings.

Manual Override

Press  to toggle through ON/AUTO/OFF modes as indicated by the Timer Status Bar.

ON mode turns on the timer.

OFF mode turns off the timer.

AUTO mode runs the set program.

Switching from ON to AUTO will turn ON the timer until the next OFF period.

Switching from OFF to AUTO will turn OFF the timer until the next ON period.

Switch status LED indicator

This is a red LED which indicates the switch contact status. Connections \times CO= and \times NO= are closed when the indicator / timer is on.

Test Mode

Test mode is provided to enable an unaided Installer to make more rapid tests of the system when compared to the normal operating mode. It enables each telephone to be connected for an extended period whilst checks are made at the Entrance Panel, the Telephone and the Control cabinet. Speech connections can be rapidly stepped through for each Telephone (1 to 64) in each cabinet (1-4) , from either a single Entrance Panel, or Door Controller PCB.

To enter Test Mode:

- Ensure all RUN/PROG switches are set to RUN.
- Press the test button marked SW3 on the Door Controller PCB of the required entrance.
- Test mode is confirmed by;
 1. Door Controller PCB (CTX64P) LED flashing red (see Diagnostic LEDs).
 2. LCD Display showing,

nnnn

 where nnnn is the first flat number on the system.
 3. Connection made to the first telephone.
 4. Display messages in lowercase.
- All other entrances will be set to idle, disconnecting any calls in progress.

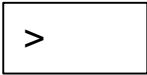
To exit Test mode:

- Switch the RUN/PROG switch to PROG, wait for the LED to start an even flash then return the switch to RUN.
- Test mode is disabled approximately 10 minutes after the last key press.

Using Test Mode from an Entrance Panel

Enter test mode as above.

CALL: Pressing the button will buzz the current telephone and two-way speech is possible; The telephone lock button can be used to release the door and the telephone is re-connected immediately afterwards.

CANCEL: Pressing this button will display  allowing a new flat number, or starting point, to be entered.

Using Test Mode from a Door Controller PCB

Enter test mode as above.

Operation is essentially the same as from the Entrance Panel:

INC: Press **SW3** to step to the next flat.

CALL: Press **SW2** to buzz the phone.

Note: These buttons may be used alternately with the controls on the Entrance Panel as described above.

Diagnostic LEDs

A diagnostic LED is provided on each Door Controller PCB and System Expander PCB to indicate its current operating mode . Two diagnostic LEDs are present on each Power Supply.

Control PCB (CTX64P)

LED state	Operating Mode
Off	Operating Mode- Entrance is inactive
On continuously	Operating Mode - Entrance is connected to a telephone
1 second ON; 1 second OFF	Program Mode - Awaiting security code
Rapid Flashing	Program Mode - Data Entry
2 second ON; 1/2 secs OFF	Test mode- Entrance is connected to a telephone
2 Seconds OFF; 1/2 secs ON	Test mode - no entrance / telephone connected.

Expander PCB (EXP64)

LED state	Operating Mode
OFF	Operating Mode - No telephone connected within Control cabinet
ON	Operating Mode-Telephone connected within Control Cabinet.
Flashing (1sec ON; 1sec OFF)	Program Mode

Power Supply (PSU138B)

Steady Green Lamp	System running from the mains.
Flashing Green Lamp	System running from the battery.
Steady Red Lamp	Output off; Battery Charging.
Flashing Red Lamp	Output short circuit or battery low.

Troubleshooting

PROBLEM	PROBABLE CAUSE AND REMEDY
No / Low speech volume	<ul style="list-style-type: none"> • >Vol A= or >Vol B= adjustment required on the Speech unit. • Speech unit supply voltage low. Check 10-15V across >C= and >H= on the unit. • Cable fault on R&O, T&O connections of Telephone or Speech unit, or R, T, 0V connections between cabinets.
Constant tone / feedback when in use.	<ul style="list-style-type: none"> • >Vol A= or >Vol B= adjustment required on the Speech unit. • Speech unit is not tight against the panel grill or panel grill is blocked. • Missing >O= connection on the telephone.
Telephone will not buzz.	<ul style="list-style-type: none"> • With an 801S,500X,LX or LXT phone check the buzzer has not been muted (telephone red LED on with 500 X Series). • Faulty O or I connection to telephone. • Telephone wired to incorrect Relay PCB (RLX8) connection. Check the >DAX Door Entry System Configuration Summary= supplied. • Check the >S= and >S= connections between cabinets.
Door open indicator will not light. (500LX and LXT phones only)	<ul style="list-style-type: none"> • Door open local/any feature dipswitch set incorrectly, refer to table 4 in the Appendix. • Parameter 9, door open delay, set too long. • Faulty L or V connection to telephone. Faulty connection to a door switch. Try shorting DOOR SW connections at the CTX64P PCB.
Phone lock button does not operate lock release.	<ul style="list-style-type: none"> • Faulty connection on Z or O line. Try shorting Z to O at the RLX8 PCB, when telephone active. • Voltage drop due to inadequate cable to Lock.
Lock release operates all the time.	<ul style="list-style-type: none"> • If the lock is a >fail safe= type it has been connected to a >FAIL SECR= output. If the lock is a >fail secure= type it has been connected to a >FAIL SAFE= output. Try swapping the connections over. • EXIT inputs permanently shorted together.

<p>Display blank at all times.</p>	<ul style="list-style-type: none"> No/low Display module supply. Check 10V-15V across +V and 0V on the module.
<p>Display shows</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">F1</div>	<ul style="list-style-type: none"> Faulty D connection to Display module.
<p>Pressing TRADES displays</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">DENY</div> <p>when not expected</p>	<ul style="list-style-type: none"> Check the Time Clock module is correctly programmed and switched on. Check parameters 5, 6,13 are programmed correctly Check >S= and >S= connection between cabinets.
<p>Pressing a Panel Key has no, or the wrong, effect.</p>	<ul style="list-style-type: none"> Faulty or incorrectly wired Keypad. Check all 8 connections between Panel and Door Controller are correct, use diagram 4 and 8 to aid.
<p>Unable to use normal operation; display shows</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 5px auto;">PGM</div>	<ul style="list-style-type: none"> A RUN/PROG switch is set to PROG; check all CTX64P and EXP64 PCBs on the system. Short circuit between PG and 0V connections
<p>Supply voltage low (less than 10V, any system component).</p>	<ul style="list-style-type: none"> Short circuit. Check all control cabinets for a red flashing LED on a power supply. Systematically disconnect cables (except telephones) one at a time from the cabinets until the fault clears. Reset the power supply each time by switching OFF and ON. Check Battery fuse after fault has been cleared

Technical Specification

Max. telephones	256 (depends on no. of RLX8 PCBs fitted)
Max. entrances	4 as standard (depends on no. of CTX64P PCBs fitted)
Mains supply	230V AC $\pm 10\%$ 50Hz
Power Consumption	120W Maximum per Control cabinet.
Operating Temperature	Entrance Panel: -11°C to + 40°C Control Cabinet: 0 °C to + 40°C
Battery Fuse	F6.3A (Fast blow).
Battery (optional).	12V 6AH Lead-Acid, Maintenance free.

Appendix

Table 4 System Expander DIP switch

Table 4a Door open local/any feature

Door Open Condition	DIP Switch setting							
	1	2	3	4	5	6	7	8
Local	X	X	X	X	X	X	X	1
Any	X	X	X	X	X	X	X	0

0- Up 1 - Down
 X - No affect on feature

Table 4b Phone bank address

This is factory set and should not need altering. The address has to be unique and not the same as a door address (see parameter 11).

Bank Address	DIP Switch setting							
	1	2	3	4	5	6	7	8
2	0	1	0	0	0	0	X	X
3	1	1	0	0	0	0	X	X
4	0	0	1	0	0	0	X	X
5	1	0	1	0	0	0	X	X
6	0	1	1	0	0	0	X	X
7	1	1	1	0	0	0	X	X
8	0	0	0	1	0	0	X	X

0 - Up 1 - Down
 X - Independent of setting

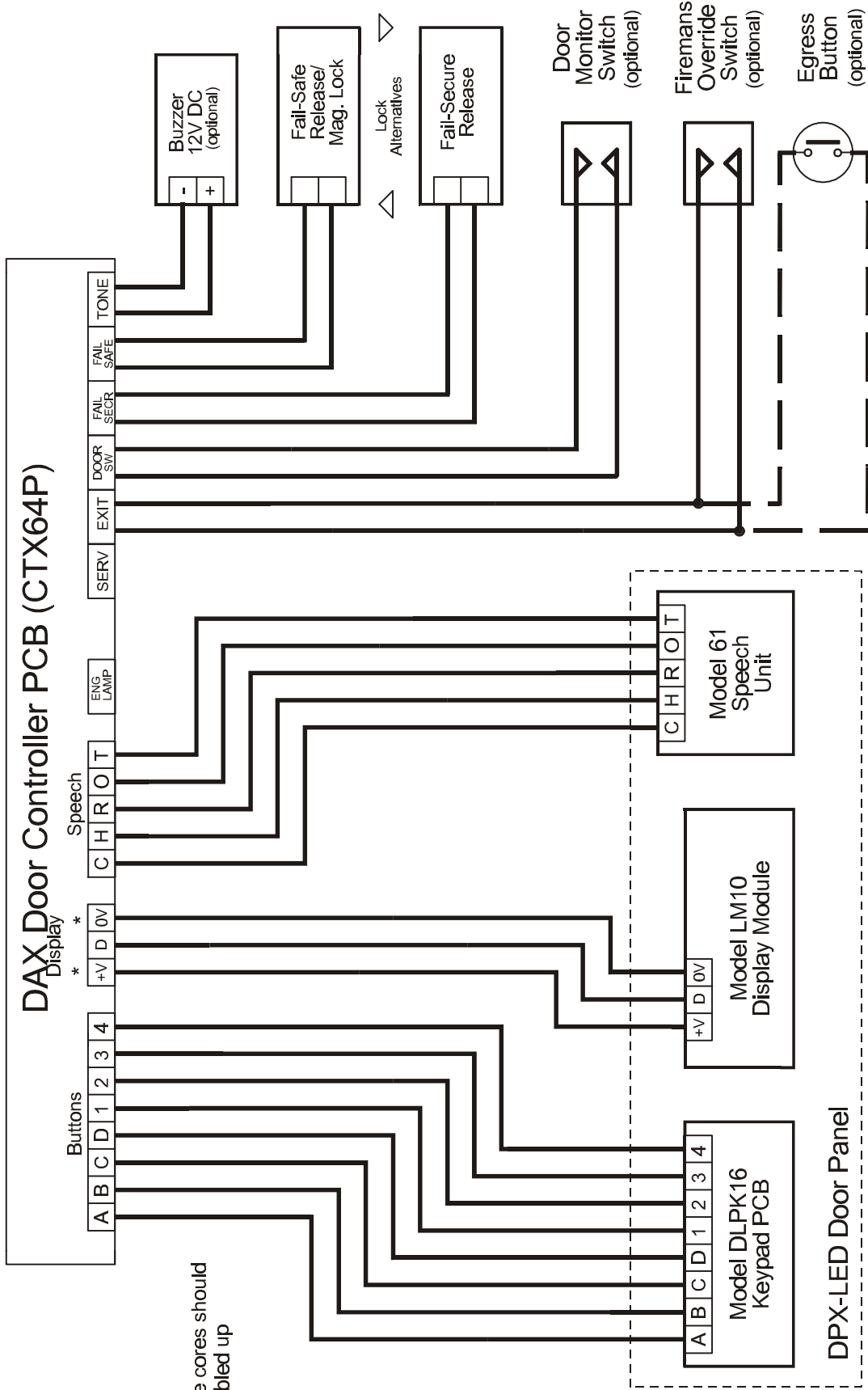
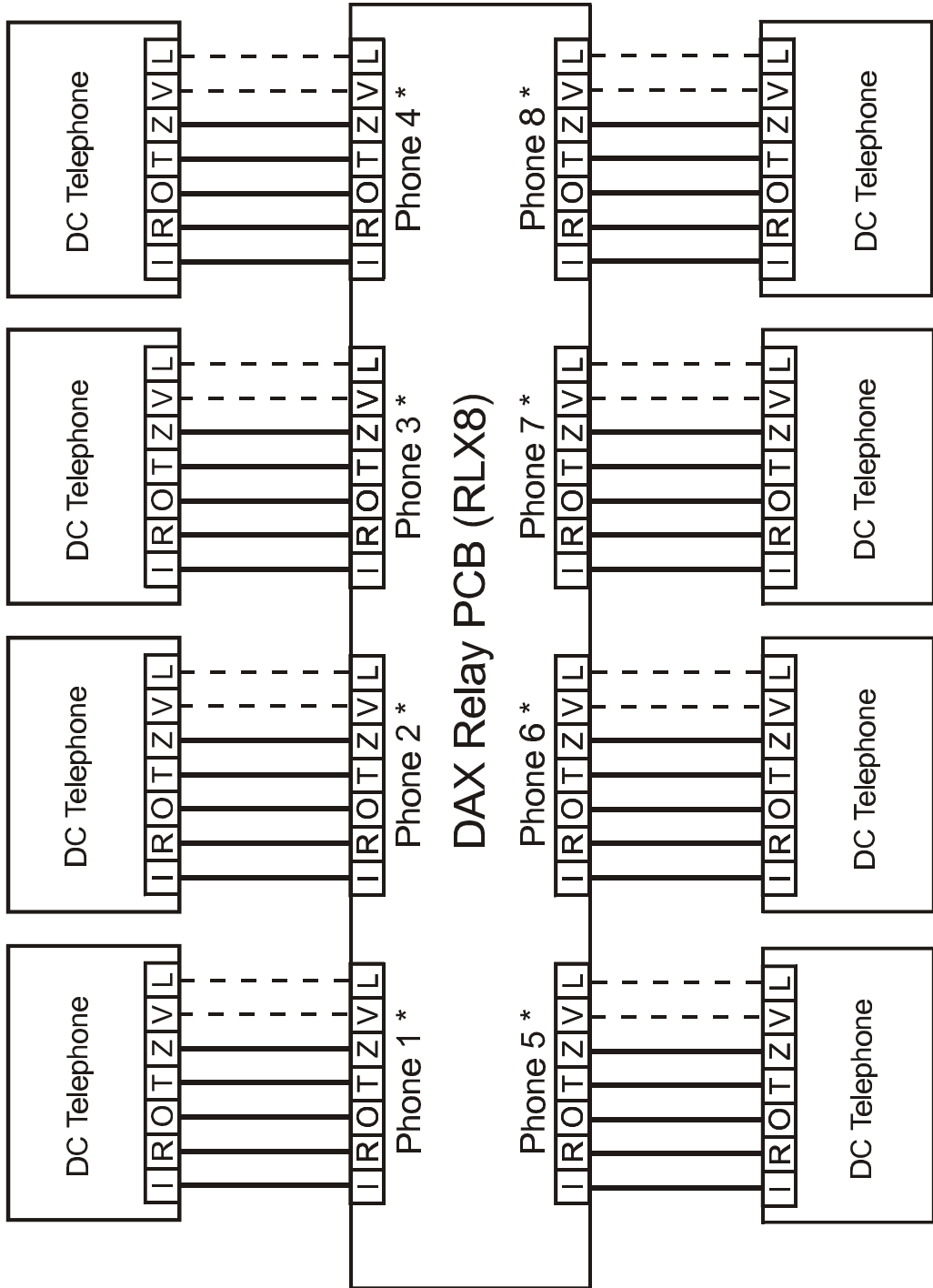


Diagram 4 Entrance Connections



* Relay PCB
Numbering

PCB	Phones
1	1 - 8
2	9 - 16
3	17 - 24
4	25 - 32
5	33 - 40
6	41 - 48
7	49 - 56
8	57 - 64

Phone Connections

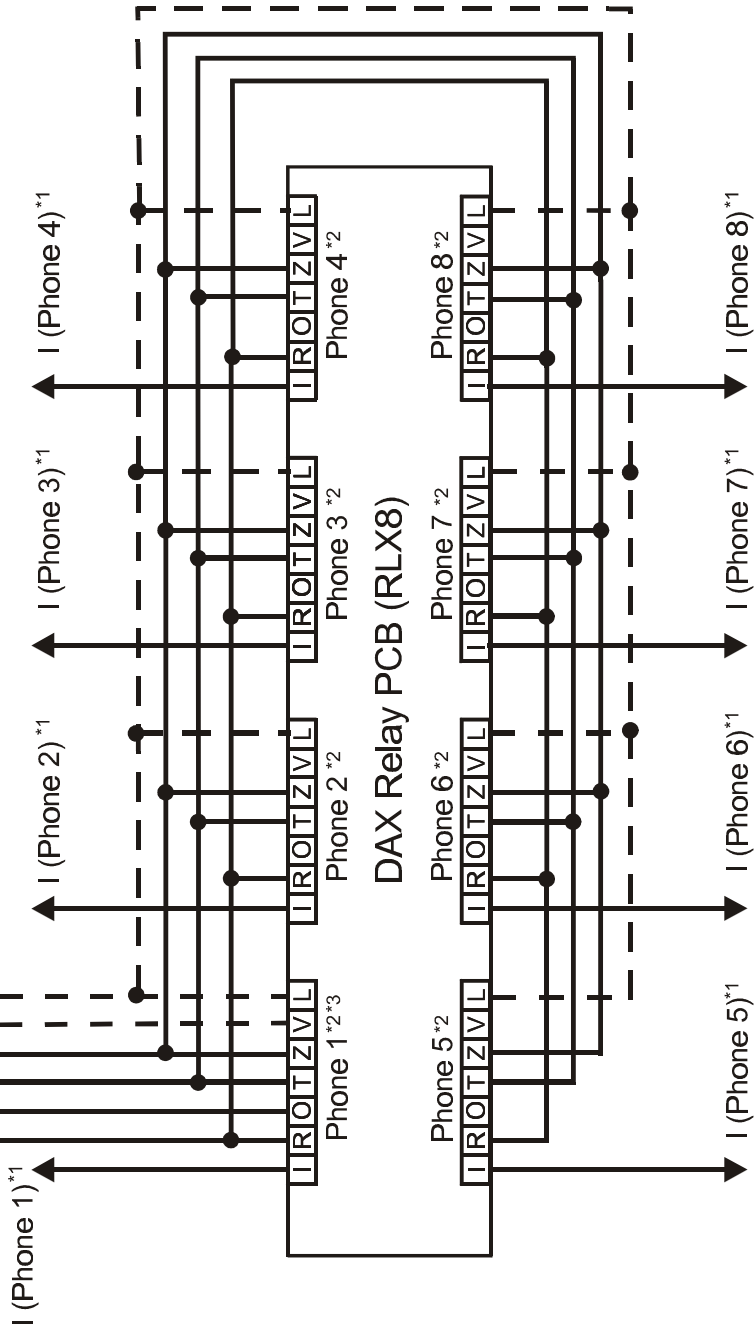
	No.	'V'	'L'
801/801S	5	X	X
500D	5	X	X
500X	6	✓	X
500LX	7	✓	✓
500LXT	7	✓	✓

Diagram 5 Telephone Connections for Full Isolation Wiring

Common Phone Connections
R O T Z V L

*2 Relay PCB Numbering

PCB	Phones
1	1 - 8
2	9 - 16
3	17 - 24
4	25 - 32
5	33 - 40
6	41 - 48
7	49 - 56
8	57 - 64



Phone Connections

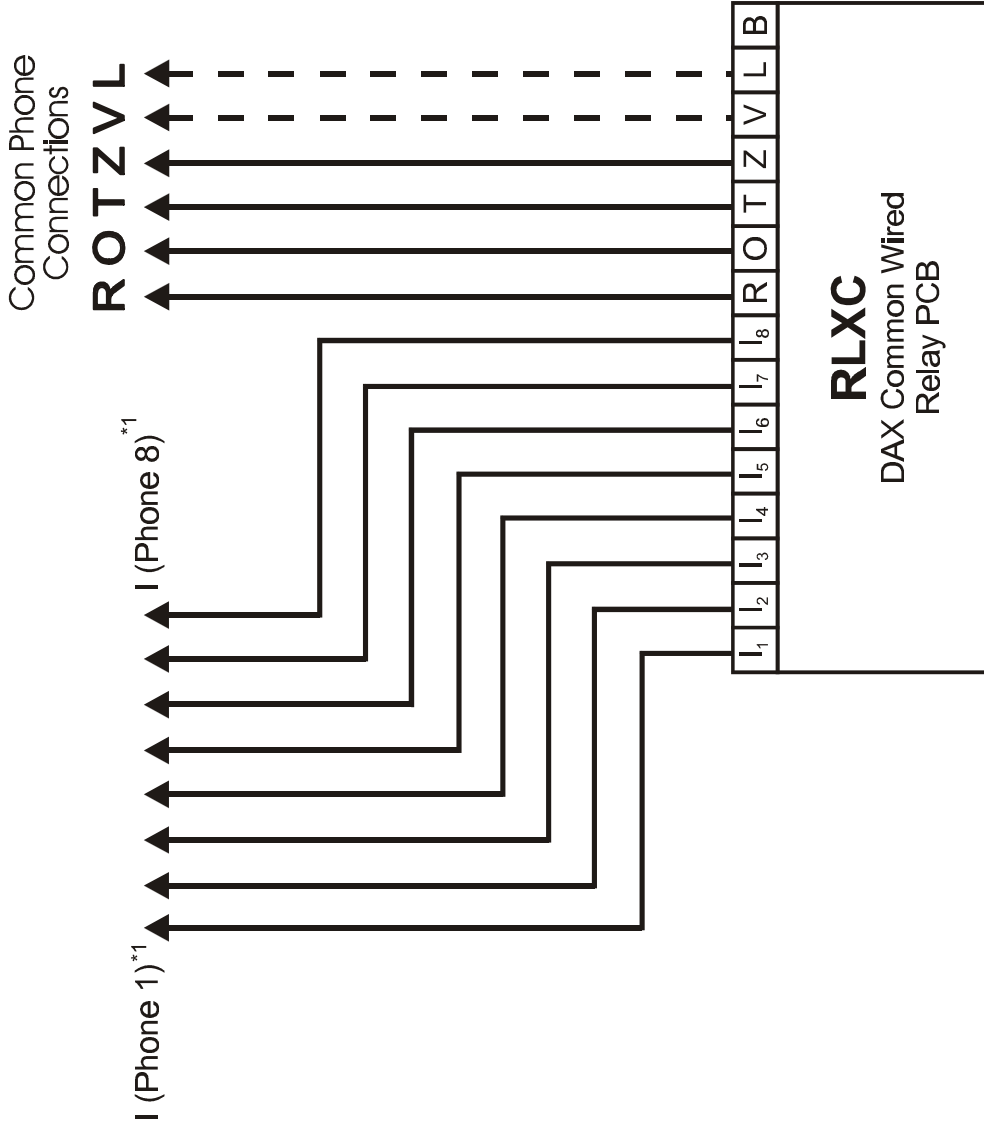
No.	'V'	'L'
801/801S	5	X
500D	5	X
500X	6	✓
500LX	7	✓
500LXT	7	✓

*1 Separate 'I' connection to each Phone.

*2 For 500X series telephones use only one 'V' connection per RLX8 as shown, and replace fuse FS1, for each RLX8, with a 1.5A Quickblow type.

*3 Fuse FS1 must be replaced with a 1.5A Quickblow type.

Diagram 6a Telephone Connections for Partial Isolation Wiring (RLX8)



*2 Relay PCB
Numbering

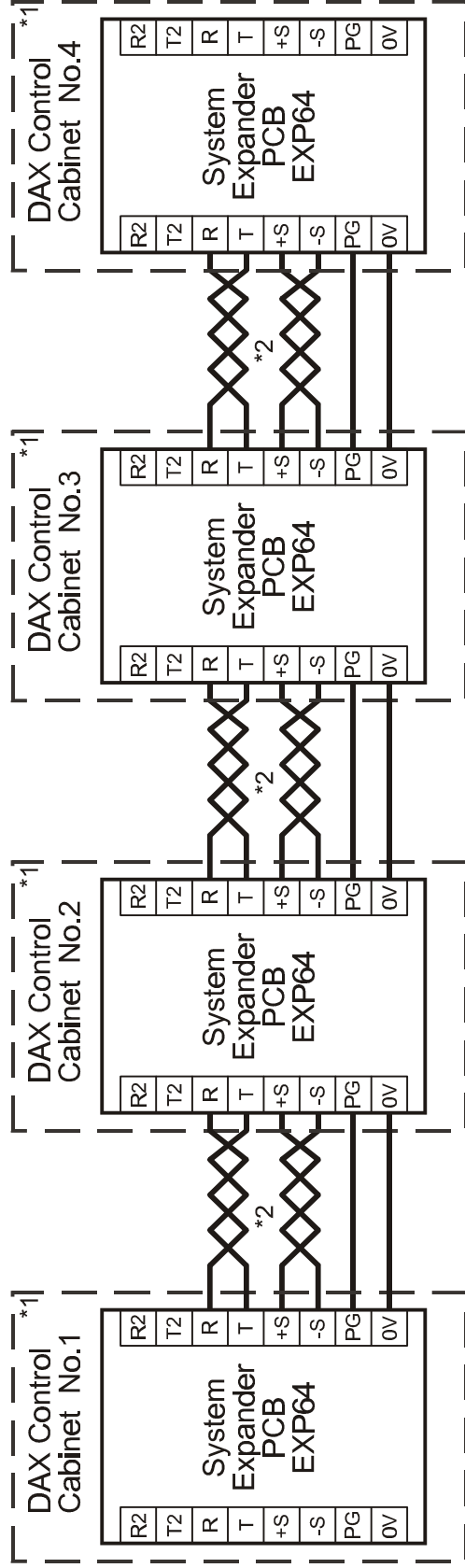
PCB	Phones
1	1 - 8
2	9 - 16
3	17 - 24
4	25 - 32
5	33 - 40
6	41 - 48
7	49 - 56
8	57 - 64

Phone Connections

	No.	'V'	'L'
801/801S	5	X	X
500D	5	X	X
500X	6	✓	✓
500LX	7	✓	✓
500LXT	7	✓	✓

*1 Separate 'I' connection
to each Phone.

Diagram 6b Telephone Connections for Partial Isolation Wiring (RLXC)



*1 Upto 64 telephones and 2 Door
Controllers per cabinet.

*2 Use twisted-pair telephone
cable.

Diagram 7 Connections between DAX Control Cabinets

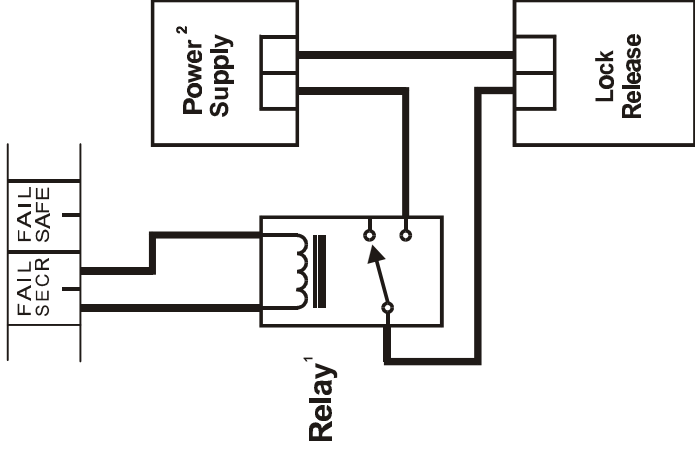


Diagram 8a Fail-Secure

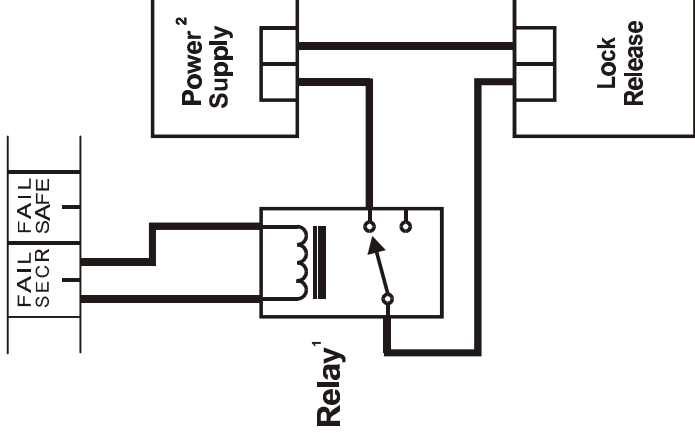


Diagram 8b Fail-Safe

Notes:

1. Single-pole changeover relay, contact rating as per lock release Lock release or contact must be suppressed for EMI.
2. Power Supply is AC or DC and rated according to lock release requirements. (polarity is not usually important)

Diagram 8 High Current Lock Releases

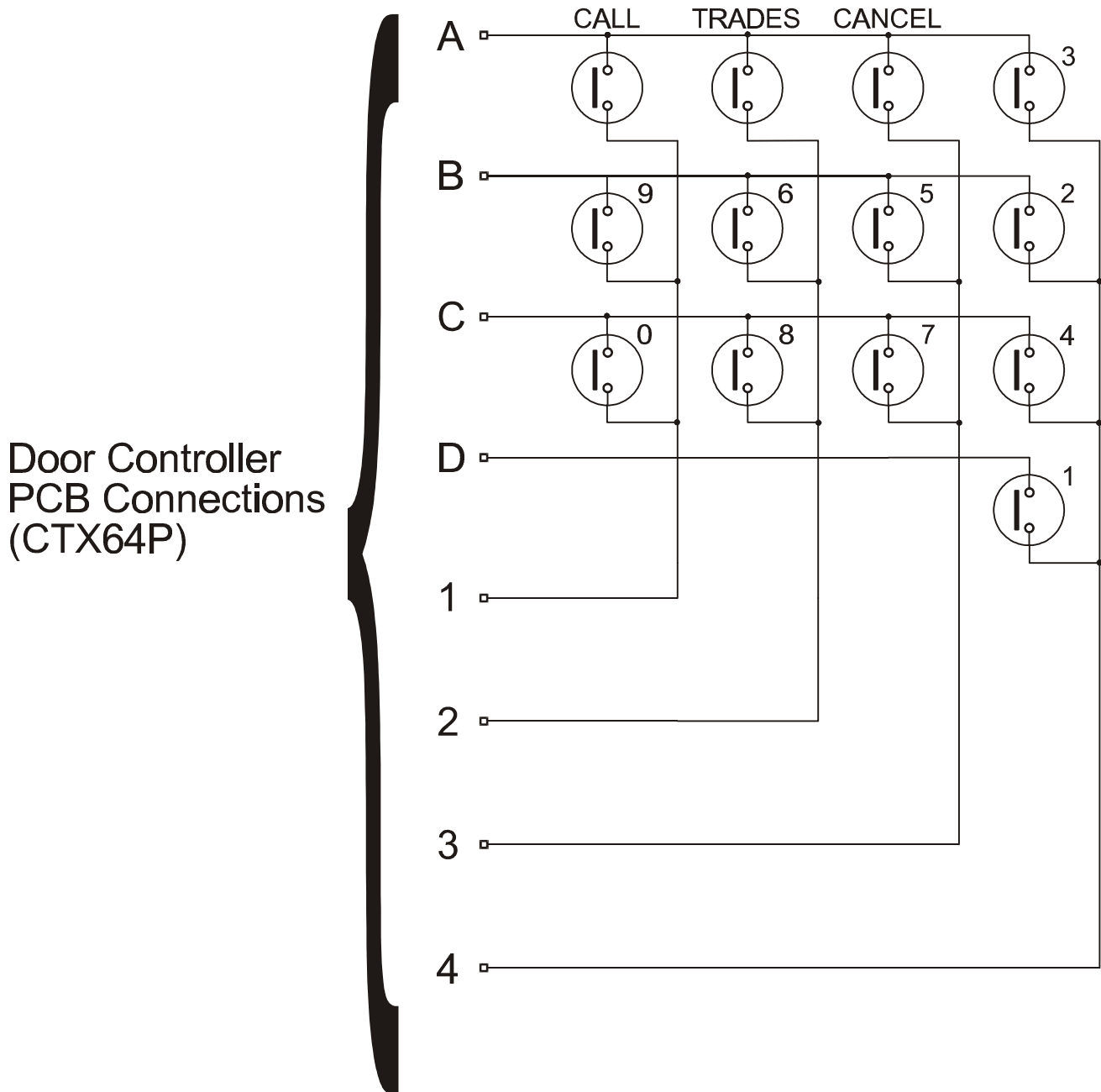


Diagram 9 Keypad Matrix Connections