

**AN INTRODUCTION TO**  
**GDX1 DOOR ENTRY SYSTEMS**

**GDX TECHNOLOGIES LTD**

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## INTRODUCTION

The GDX1 Door Entry System (RBE68/3 Board) provides a low cost door entry system with excellent features. These features include automatic BST/GMT adjustment, five programmable Service Periods, one of which is day specific, optional Sunday Service, programmable Call tone and programmable Door Switch (PTE/Fire Switch) sense; all of which can be configured after installation and altered at any time. The system can also be configured, using links, to drive any of the three standard lock release units and to provide the option of Battery Backup. The links are non-solder type miniature jumpers making set-up simpler and faster. The system is capable of operating with either an RBE210/2 GDX1 handset, an RBE210/3 'GDX' telephone, a 18229 new moulding tone handset or a Non Modified Comelit handset.

Note : The numbers quoted above are the PCB identification numbers printed on the PCB inside the handsets.

## GENERAL DESCRIPTION

### System

The complete basic GDX1 Type Door Entry system comprises of the following units :-

Main System Control Rack  
Door Entry Panel  
Up to 18 Telephones  
Door Lock Release Unit  
Fire Switch/PTE

### Main System Control Rack

The Main System Control Rack circuitry is based around an MC68HC705C8A Microcontroller IC and a DS12887 electronic timeclock IC Module. The DS12887 provides a non-volatile store for the microcontroller ensuring 100% recovery from power supply interrupts.

## Locks

A choice of three lock units may be operated from the system and are described in the following table.

Lock Type	Links
12Vac @ 1A Energise to Unlock	L4,L2 Fitted - L3,L1 Not Fitted *
12Vdc @ 500mA Energise to Unlock	L3,L2 Fitted - L4,L1 Not Fitted
12Vdc @ 500mA De-Energise to Unlock	L3,L1 Fitted - L4,L2 Not Fitted

\* If ac locks are to be used then Diode D19 should be removed and replaced with a Transient Suppressor GEV272Z1. D19 must be fitted for all dc lock types.

If the GDX1 door entry system is required to operate a lock of higher rating, the power system circuit will have to be adapted or a separate power supply employed.

**Note that no power should be applied to the system when the links are being configured.**

## Telephone Connection

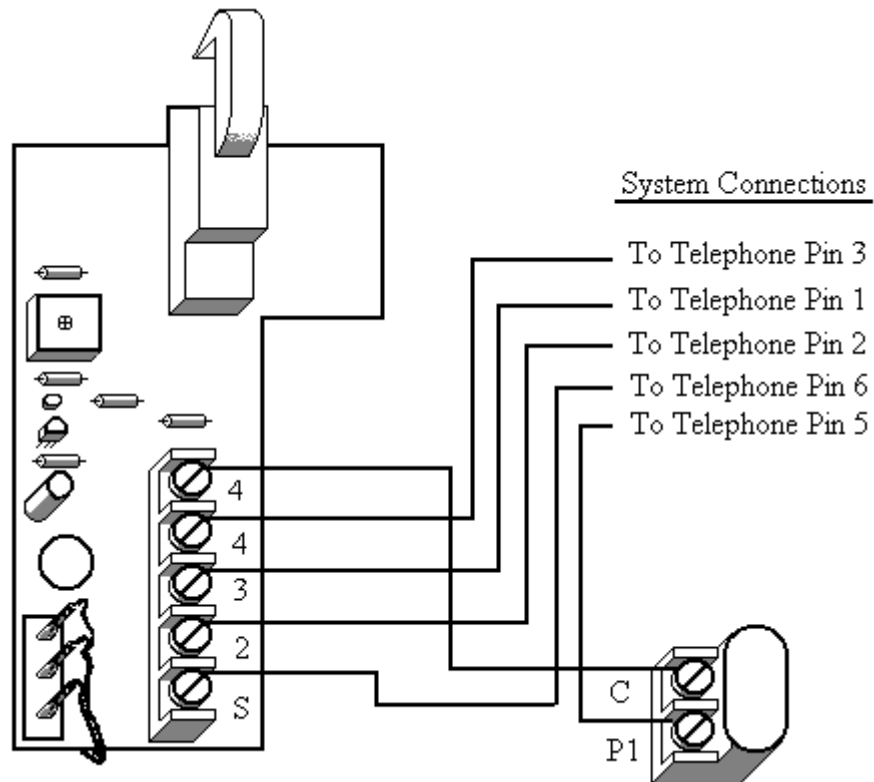
For the GDX1 system the Telephone is connected only to the System Control Rack via a **6 Core CW1308 twisted pair telephone cable**. The standard cable colour coding and wire designation is as follows :-

Line	Function	Colour
1	Audio Phone to Door	WHITE/blue
2	Audio Door to Phone	BLUE/white
3	0v	WHITE/orange
4	12Vdc	ORANGE/white
5	Phone Lock Open Control	WHITE/green
6	Call Signal	GREEN/white

The telephone used may be a Non Modified Comelit Unit, an RBE210/2 or an RBE210/3 fitted in the Comelit Moulding or a 18229 fitted in the new  $\frac{3}{4}$  length moulding (Note : RBE210/2, RBE210/3 & 18229 are the legends on the PCB's contained within the handsets). The connections when using each type are indicated below.

## Non-Modified Comelit Handset

The connections to the unmodified Comelit Unit is as shown below :



## RBE210/2 GDX1 Handset

When using the RBE210/2 telephone the connections are the standard 6-wire to 6-wire connection. i.e. 'one to one'. If this type of telephone is to be used then a 56  $\Omega$  6 Watt resistor must be fitted between locations 6 and 3 of the specific telephone termination block in the Control Rack.

## RBE210/3 GDX1 Handset

When using the RBE210/3 telephone the connections are the standard 6-wire to 6-wire connection i.e. 'one to one'.

## 18229 GDX1 Tone Handset

When using the 18229 telephone the connections are the standard 6-wire to 6-wire connection i.e. 'one to one'.

## Power Supply

The unit may be powered from a single source with or without battery backup. The following link settings must be used:-

Battery Backup Fitted	Links
YES	L5 Fitted L6,L7 Not Fitted
NO	L6,L7 Fitted L5 Not Fitted

(Note that if the battery backup is **not** to be utilised then components D15, D16, D17, D18, R41, R42, TR9 and RL2 may not be fitted. If they are fitted and battery backup is **not** required, then link 7 should be removed.)

On the system rack a toroidal transformer provides a 12Vac supply to the main control circuitry. This ac supply is used to provide 12Vdc and 5Vdc regulated supplies and an unregulated 17Vdc supply. The unregulated supply is used to power the Call Signal Amplifier as well as the E/P Buzzer. The regulated 12Vdc supply is used to drive the lock and supply 12Vdc to the handset and audio circuits. The 5Vdc regulated supply is used to power all the digital circuitry and input sense circuitry.

Several LED's indicate the status of the Power Supply and are outlined in the table below:-

Power Source	LED Illuminated
Vdc Unregulated	Green LED (D11)
12Vdc Regulated	Red LED (D12)
5Vdc Regulated	Red LED (D14)
Low Power Level Warning (Indicates Low Battery Level)	Amber LED (D17)

The 12Vdc supply is short circuit protected, however a 1 Amp Fuse must be fitted in FS1. Fuse FS2 protects the AC lock output if AC locks are selected. A 1.6A fuse should be fitted in FS2 if required.



## PROGRAMMING

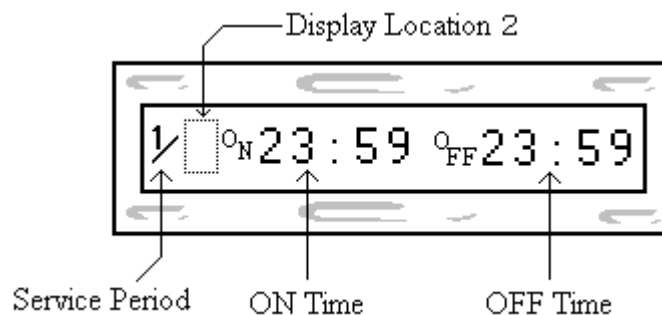
### Service Periods

There are five service periods, four of which may be configured to occur everyday including/excluding a Sunday. The fifth service period is specified for a particular day and is independent of whether Sunday Service has been selected or not. All service periods must be configured with valid times. To disable a service period simply make the ON time the same as the OFF time. All service periods are checked after entry and if an error is detected the user is requested to re-enter the service periods. After the five service periods have been configured the user is presented with the option of Sunday Service. Note that the Sunday service setting only applies to Service Periods 1 to 4. The default for Sunday service is OFF.

Service Period	Type	Duration	Effective	Sunday Service
1 to 4	Standard	24 Hours	On all Days	Optional
5	Non Standard	24 Hours	On Specified Day	Not Applicable

### Setting the Service Periods

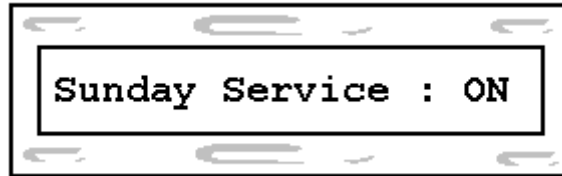
To begin alteration of the current Service Period Set-up press the 'Service Periods' Button. The Screen display should be as follows :-



The option which is currently flashing on the display is now under review and may be changed using the 'Increment' Button. When the user is happy with this setting the 'Next' Button should be pressed to move the focus on to the next option.

The fifth service period display differs from the first four in that the 'active day' is displayed in location 2 of the display.

When all five service periods have been configured the user is presented with the following option :-

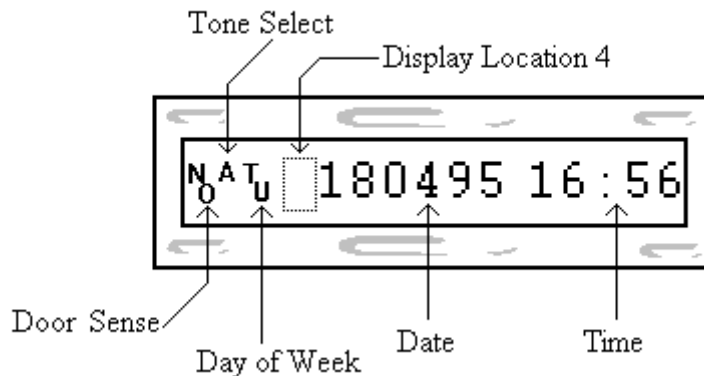




To switch the Sunday Service ON and OFF use the 'Increment' Button. When satisfied with the selection press the 'Next' Button. The display should then indicate that Checking is in progress. If the system is happy with the Service Periods the Normal Display, as explained next, is resumed.

If at any time during the Service Period Set-up procedure the user wishes to abort input simply press the 'Service Periods' button again or avoid data entry for 30 seconds.

### Normal Display

The Normal Display which is displayed continuously during normal idle Operation contains information regarding the Door Switch Sense (Fire Switch/PTE), which Tone has been selected, the day of the week, date, time and information regarding whether Sunday Service has been selected and if the current time falls within a defined service period. An example of the display is as follows :-




A flashing  symbol in location 4 of the display indicates that the current time falls within a service period. Similarly a flashing  in location 4 of the display indicates that Sunday Service is ON. Both symbols may be flashing alternately reflecting the current system conditions at the current time.

### Setting the Date/Time/Tone/Door Sense

By pressing the 'Date/Time' Button the user may alter not only the Date and Time but also the Door Switch Sense and the Selected Call Tone. After pressing the 'Date/Time' Button the first character of the display will be flashing. This is the Door Sense. The Door sense may be toggled between Normally Open ( $\overset{N}{O}$ ) or Normally Closed ( $\overset{N}{C}$ ) depending on the type of Door Switch being used, the default is Normally Open. To change the sense use the 'Increment' Button. When satisfied with the selection use the 'Next' Button to move the focus to the next option which is the Tone Select Option. The user may select from three Call Tones A,B or C the default being A. As before the 'Increment' Button is used to change the setting and the 'Next' Button is used to move the focus to the next option.

After selecting the desired Door Sense and Call Tone the user may now set-up the Day of the Week and the current Date and Time using both the 'Increment' and 'Next' Buttons. When the minutes have been set-up and the 'Next' Button is pressed the Time will begin to increment in a normal fashion.

If at any time during the Date/Time Set-up procedure the user wishes to abort input simply press the 'Date/Time' button again or avoid data entry for 30 seconds.

Note: If the wrong Door sense has been set and the unit is now displaying the Door open/close symbol () and the lock is open, the system will now disregard all other inputs. To change the Door sense press **and hold** the Date/Time button and press RESET. When the display indicates 'Set Date/Time' release the Date/Time button and continue as before.

## OPERATION

### Normal Operation.



When a caller depresses a button at the Entrance Panel a Tone Signal is enabled and routed to the appropriate telephone for the duration of time that the button is depressed. During the time that the tone is enabled the Telephone will ring, provided the receiver is in place, and the buzzer on the entrance panel will sound. On lifting the receiver, full duplex audio communication is established between the Telephone and the caller at the Entrance Panel. The Telephone operator may then operate the lock release on there Telephone when the receiver is on or off the hook. When the lock release is operated the lock relay will be closed, and the Entrance Panel buzzer will sound, for a duration of approx. 5s. The display will indicate the operation of the lock release button by a rotating key (🔑) symbol and the word 'Lock'.

### Door Switch Operation

The Door switch input may be used as a PTE (Push to Exit) or as a **Non Fail-Safe** Fire Switch. When the Door switch is operated the lock relay will be closed and the Entrance Panel buzzer will sound four 'beeps' before being disabled until such time as the Door Switch is inactivated. During this period the words 'Door Switch' and the door open/close symbol (🚪) will be displayed.

**If the user wishes to provide a Fail-Safe Fire Switch then a Normally Closed type should be placed in line with the Door Lock +ve supply and De-Energise to open locks should be used.**

### Service Operation

When the service button is pressed a check is made as to whether the current time falls within a service period. If the result is yes then the lock is activated for a pre-defined duration (5 seconds). During the time that the lock is activated the Entrance Panel buzzer will sound and the display will indicate an opening/closing door symbol (  ) and the word 'Serv.' If the current time does not fall within a service period a 'no entry' symbol (  ) is displayed along with the word 'Serv.'

### Automatic BST/GMT Adjustment

The daylight saving function of the DS12887 provides automatic adjustment of the time when changing from BST to GMT and vice versa. On the first Sunday in April the time increments from 1:59:59AM to 3:00:00AM and on the last Sunday in October when the time first reaches 1:59:59AM it changes to 1:00:00AM.

### Set-up Requirements

Electrical configuration of the board involves adjusting two potentiometers VR1 and VR2. VR1 is used to adjust the intensity of the display and VR2 is used to adjust the 12v supply regulation. To adjust VR2 connect a meter across telephone 1 terminals 3 and 4 and adjust the potentiometer until the voltage is 12.0v if no battery backup is required and to 13.6 volts if battery backup is required.

## TECHNICAL DETAILS

### Fault Finding Guide

#### Fault Symptom : No Power On System

Check visually that the following LED's are illuminated :-

Green LED D11	Unregulated DC Supply
Red LED D12	12 Volt DC Supply
Red LED D14	5 Volt DC Supply

If no green LED D11, then neither D12 or D14 will be illuminated either.

Check AC supply rails across AC1 & AC2 and across AC3 & AC4. There should be approximately 14 VAC across both of these sets of terminals.

If no AC present, check mains fuse located within mains terminal block. If fuse is okay, but there is no output from the transformer, then the transformer itself must be suspected.

#### Fault Symptom : No Supply To Telephones Or Lock Release

Check Fuse 1 - the 12 VDC supply fuse.

If blown, check with a meter for a short either across terminals 3 & 4 of any phone connections at the control rack or across the lock output terminals.

If a short is found, disconnect the lock from the control rack and check again. If the short has been removed, the lock or the lock cable must be suspected.

If the short still has not cleared, disconnect the phones from the rack one by one, checking for the short after each one has been removed until the shorting handset is found. Either the handset itself, or the cabling to the handset, must be suspected. Meter out the cabling to that handset and then try replacing the handset itself if the cabling is sound.

Replace the 1A 20mm Fuse and reset the control rack.

### Fault Symptom : No Speech, Or Speech One Way On Whole System

Check the connections to the speech unit from the control rack. Check with a multimeter for a broken wire on either of connections 1 and 2 between the ADU and the control rack. Also check for a short between wires 1 and 2 and any other of the wires to the ADU within the cable itself. Again, also check for a short between wires 1 and 2 to ground (ie. onto the backbox or door frame etc). The cable itself can be ruled out by connecting the entrance panel directly into the control rack on a short length of cable.

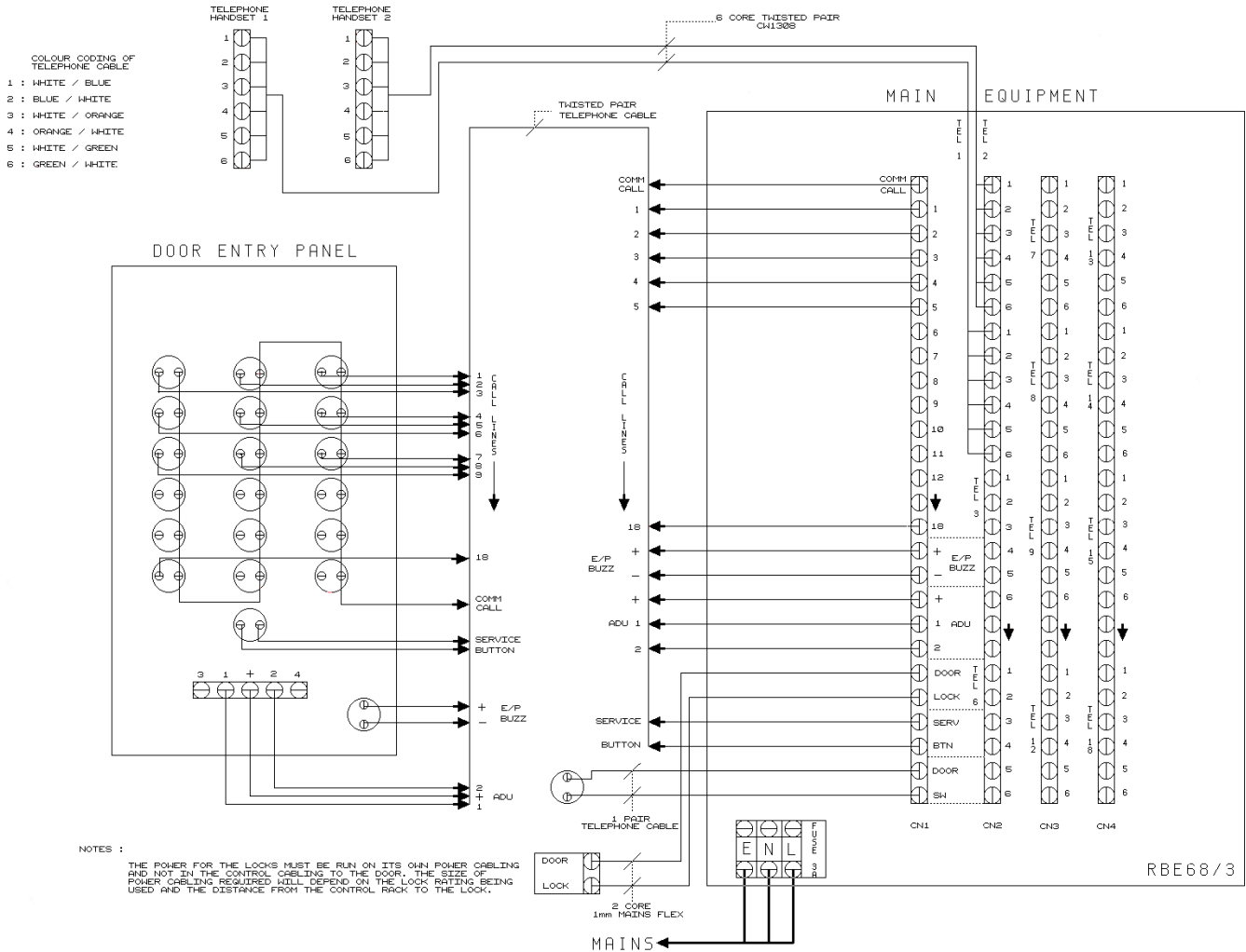
### Fault Symptom : No Speech, Or Speech One Way On One Handset

Check connections to the handset from the control rack. Check with a multimeter for a broken wire on either of connections 1 and 2 between the control rack and the handset. Also check for a short between wires 1 and 2 and any other of the wires to the handset within the cable itself. The cable itself can be ruled out by connecting the handset directly into the control rack on a short length of cable. If all of the above don't provide the fault, try another handset into the affected rack telephone position to determine if the handset itself is faulty.

### Fault Symptom : Lock Open All The Time

If the lock is open all time and only closes when the lock release button on the handset is operated, the lock type selection switch has been incorrectly set at normally closed. Switch off the control rack power and reconfigure the miniature jumpers as detailed earlier in this document.

# GDX1 Connection Drawing



When Using the 9601 ADU connect as follows :-

