



Digital Security Controls

PC-2000

MICRO-COMPUTER BASED CONTROL PANEL

The PC2000 is a 10 zone microcomputer controlled alarm control panel with programmable keypad and built-in digital communicator. One keypad is supplied with the panel and up to four additional PC2000-RK keypads may be connected, with 4 conductor cable, to the control panel. The communicator transmits in single line or extended format, 24 separate alarm and status conditions. It automatically selects the correct transmitting format and continually monitors the telephone line for faults.

CONTROL PANEL SPECIFICATIONS

1: 10 zones including:

- 6 fully programmable zones (5 high and 1 low)
- 1 auxilliary smoke detector zone
- 2 keypad activated zones (fire and police)
- 1 delay zone (located on keypad) for entry door near keypad

2: Audible alarm output:

- 60 watt built-in siren driver (4 eight ohm speakers) (activated by cutting jumper number J4)
- 5 amp bell output
- output is pulsed for auxiliary smoke detector circuit and keypad fire circuit
- supervised for open circuit

3: Programmable voltage output:

- 50 ma voltage switch to ground
- see programming sheet for a list of options

4: Powerful 1.5 Amp regulated power supply:

- 13.8 or 14.2 volt output (14.2 volts is obtained by cutting J1)
- minimum current drain 150 ma with 1 keypad
- 600 ma available for auxiliary supply
- Dynamic battery testing checks battery under load every 10 seconds
- requires 16 volt 30va transformer
- requires 4 AH 12 volt battery

5: 5 Level Static/Lightning Protection:

- special "ZAP-TRAC" circuit board configuration
- Metal Oxide Varistor (MOV) protection devices
- independent passive and active ground planes
- computerized component placement and P.C.B. layout
- multiple level filtering on inputs

6: External "Watchdog" monitoring circuit continually checks on microprocessor program execution

7: Metal cabinet;
 -9.5" x 11.75" x 3.25" deep
 -6.5 lbs.

REMOTE KEYPAD SPECIFICATIONS (PC2000-RK)

- 1: 4 Wire (QUAD) hook-up
- 2: up to 5 keypads per system
- 3: 2 wire delay circuit can be connected at keypad (cut blue wire loop on back of keypad to use)
- 4: built-in peizo sounder (cut yellow jumper on back of keypad to silence)
- 5: full annunciation of zone and system status
- 6: nominal 60 ma current
- 7: 5.5" x 3" x 1" deep

DIGITAL COMMUNICATOR SPECIFICATIONS

- 1: 24 reporting codes
- 2: transmits all major 10 and 20 BAUD formats
- 3: telephone line monitoring circuit
- 4: extended or single line reporting format
- 5: 3 or 4 digit customer I.D. code
- 6: 1 or 2 digit alarm reporting code
- 7: pulse or DTMF (tone) dialing
- 8: DFDT line seizure
- 9: true dial tone detection
- 10: hexadecimal reporting
- 11: anti-jam feature
- 12: two telephone numbers

PROGRAMMING INSTRUCTIONS

The PC2000 is shipped with a blank 2732A EPROM memory chip. This chip must be programmed using a master chip, which is available from your distributor, and a Digital Security controls EP-1 programmer. Set the EP-1 programmer for 2732A by pushing the black switch on the front of the cabinet.

ZONE OPTIONS

The 6 programmable zones (Z1-Z1B TO Z6A-Z6B) on the control panel must be programmed (locations FE5 to FE6). The numbers put in these locations determines the zone type. Entering 0 to 3 in the 1st or "R" column will make the zone either fast or normal response time and silent or audible (see programming sheet). Entering 0 to 7 in the 2nd or "T" column will make the zone one of the following types:

- 0 for a delay circuit which has an entry and exit time delay,
- 1 for an instant circuit which is active as soon as the control is armed,
- 2 for an interior (instant/delay or follower) circuit which

- has an exit delay and an entry delay if a delay circuit has been tripped first,
- 3 for an interior circuit (as in type 2) only with home-away (in home-away feature the zone is shunted unless the delay circuit is exited during the exit delay period,
 - 4 for a 24 hour circuit which is always active,
 - 5 for a 24 circuit which starts the keypad sounder when the panel is disarmed and sounds the siren or bell when the panel is armed,
 - 6 for a 24 hour circuit which starts the keypad sounder both when the panel is armed and disarmed,
 - 7 for a double delay (garage) circuit which doubles the programmed entry delay time.

The "Aux. Zone" or smoke detector zone on the control panel is preprogrammed to operate in the following way. When an alarm is created (by closing a contact between the "Aux. Zone" terminal and Ground) the bell or sirens are sounded. The digital communicator delays the alarm transmission for 30 seconds. If the [#] is pressed during this time the bell will stop and the digital communicator will not transmit. When the [#] is pressed a 2 minute timer is started, if the smoke detector has not reset during this time the bell will start to ring again. If the [#] key is not pressed within 30 seconds the communicator will transmit. This time out function can be repeated until the smoke detector is reset. The "Aux. Zone" is annunciated on the keypad as the zone 7 light. The same zone light is used for a fire signal activated from the keypad fire zone.

The FC2000-RK keypad has a closed circuit delay loop. To use this circuit, cut the blue jumper and connect normally closed contacts in series with the open ends of the blue wire. This circuit uses zone 8 light on the keypad. It is advised that this circuit be used on only one keypad in a system because the zone is shown as zone 8 regardless of which keypad the alarm is created from, the system will only acknowledge the alarm from the first open loop and it will not show restoral until all keypad loops are closed.

EXTENDED FORMAT REPORTING

Extended format reporting is used with a 3 digit customer code and a single digit alarm reporting code to provide more detailed information from the digital communicator by transmitting two lines of code instead of the normal single line. The 1st line of extended format is the same as the normal format transmission (3 digit customer I.D. followed by 1 digit alarm code). The second line of the transmission repeats the last digit of the first line and adds a new digit which provides the additional information. The extended format provides added information in three different areas. With alarm and restoral transmissions the zone which caused the alarm can be sent. With arming and disarming transmissions the number of the code used to arm or disarm can be sent. With system trouble transmissions the type of trouble can be sent.

Alarm Example:	1st line	123 3
	2nd line	333 6

In the 1st line, the customer code is 123 and the type of alarm is 3 (which is normally burglary). In the 2nd line, the type of alarm is repeated followed by the number of the zone which caused the alarm. 1 to 6 are used for control panel zones 1 to 6, 7 is used for the keypad fire zone and "Aux. Zone" and 8 is used for the keypad delay zone.

Arm/Disarm Code Example: 1st line 123 5
 2nd line 555 2

In the 1st line, the customer code is 123 and the arming code is 5 (the arming code would be programmed into location FDD). In the 2nd line, the arming code is repeated followed by 2 the number of the code that was used for arming. There are 8 four digit user codes which can be programmed from the keypad the 2 in this example represents this second of these codes as they appear on the zone display. In addition 0 (Hex "A" for 10 pulses) represents the master code, 9 represents quick arm and Hex "B" represents automatic arm. The user code number is also transmitted with the disarm code (location FDC), duress code (location FDB) and partial arm (location FDE).

Trouble Example: 1st line 123 7
 2nd line 777 1

In the 1st line, the customer code is 123 and the trouble code is 7 (the trouble code would be programmed into location FE2). In the 2nd line, the trouble code is repeated followed by 1 for low battery trouble. 2 is for AC failure. 3 is for fuse failure. 4 is bad telephone line. 5 is failure to communicate. 6 is not presently used. 7 is bell/siren circuit open. 8 is restart from total power failure.

KEYPAD FUNCTIONS

INTRODUCTION

The PC2000-RK remote keypad provides complete information and control of the PC2000 control panel. The 8 zone lights provide alarm and status indication for the alarm circuits. The 6 function lights guide the user in operating the system. The built-in sounder lets the user hear correct key entries and other alert signals. The 12 digit keypad is used for code entry and other programming functions.

MASTER CODE

1: The master security code is programmed into the PC2000 memory chip at the time of installation (locations FB8 and FB9). The master security code is used for arming and disarming the control panel, for programming up to eight additional security codes and for changing other features from the keypad.

ARMING

1: The 'READY' light must be on before the panel can be armed. If the



ready light is not on check if any of the 8 zone lights are on. If any are on check for open contacts on those circuits. The control cannot be armed unless all zones are closed or by-passed.

2: Enter a 4 digit security code. As each digit is entered the keypad sounder will beep. If the code is valid and entered correctly the keypad sounder will beep quickly 6 times and the arming light will go on to indicate that arming has taken place. If the security code is not valid or is entered incorrectly the keypad sounder will beep steady for 2 seconds. If the security code is correct but the panel cannot be armed because of an open zone, the keypad sounder will beep quickly 3 times for the correct code followed by a 2 second beep because the ready light was not on.

3: Also see; ZONE BY-PASSING, QUICK-ARM and AUTO-ARM.

DISARMING

1: Enter 4 digit security code. If the code entered is valid, the keypad sounder will beep 6 times and the "ARMED" light will go out. If an alarm occurred while the panel was armed, the memory light and the zone light which caused the alarm will start to flash and stay flashing for 30 seconds after disarming.

ZONE BY-PASSING (SHUNTING)

1: Press [*] and [1] keys to examine which zones are shunted or to add or remove zone shunts. The shunt light will flash and zone lights of the shunted zones will be on. To shunt a zone press that zone number on the keypad. The zone light will then come on to show that the zone is shunted. Pressing the same number again will remove the shunt from that zone causing the zone light to go out. Pressing zero will cause all zone shunts to be removed.

2: If zones are shunted the SHUNT light will always be on while the panel is disarmed. All the lights, except the arming light, go out when the panel is armed (after the exit delay).

3: If a partial arm code is programmed (location "FDE") this code will be transmitted if the panel is armed with one or more zones shunted.

4: Shunted zones are automatically unshunted after each disarming. If required, the shunting command must be applied before each arming.

5: Shunted zones are not active during the armed period and any alarm is prevented on these zones. Zone shunting is used when free access is required to part of the protected area. It is also used to temporarily remove, so the control panel can be armed, damaged zones until repairs can be made. The user should be instructed to watch that zones are not shunted unintentionally. If the SHUNT light is on when arming the panel, first check to see which zones are shunted before arming.

6: Press the [#] key to exit the shunt mode to the normal arm/disarm mode or press the [*] key followed by a number key to enter another function mode. The panel will return to the normal arm/disarm mode in 30 seconds if the keypad is not touched.

TROUBLE DISPLAY

1: The PC2000 continuously monitors a number of possible trouble conditions. If one of these conditions occur the keypad trouble indicator will light.

2: Press the [*] and [2] keys to display the type of trouble. The zone lights indicate the type of trouble condition.

- 1- DEFECTIVE STANDBY BATTERY
- 2- AC POWER FAILURE
- 3- BLOWN FUSE IN CONTROL PANEL
- 4- UNSUCCESSFUL COMMUNICATION ATTEMPT WITH MONITORING STATION
- 5- TELEPHONE LINE PROBLEM
- 6- not presently used
- 7- BELL/SIREN CIRCUIT DEFECTIVE
- 8- MEMORY LOSS (USE MASTER CODE TO REPROGRAM)

ALARM MEMORY DISPLAY

1: If the memory light is on an alarm has occurred during the previous armed period. The memory will be cleared when the panel is rearmed.

2: Press the [*] and [3] keys to display alarm memory. The memory light and zone light will flash to show which zone caused the alarm.

3: Press the [#] key or wait 30 seconds to return to the arm/disarm mode.

ALARM TEST

1: Press the [*] and [4] keys for a 4 second test of the keypad lights, keypad sounder and sirens.

PROGRAMMING ADDITIONAL SECURITY CODES

1: Press the [*] and [5] keys then enter the master security code to enter the additional code programming mode. The "Program" light will then flash.

2: Eight additional codes may be programmed. The zone lights are used to indicate which of these codes are already programmed (zone light on steady) and the one which is currently being programmed (zone light is flashing).

3: To program the 1st additional code, press [1] then enter a 4 digit code. Zone 1 light will flash and sounder will beep after pressing [1]. Keypad sounder will beep three times and zone light will come on steady after 4 digit code is entered.

4: To remove the 1st additional code, press [1] then enter [#],[#],[#],[#]. Zone 1 light will flash and sounder will beep after pressing [1]. After pressing [#],[#],[#],[#] the sounder will beep three times and zone 1 light will go out to show that the code has been removed.

5: Follow the instructions in 3: and 4: for programming or removing any of the other additional codes.

6: Code number 8 is a special one time use or "Maid's Code". This code allows the panel to be disarmed only once. It must be reprogrammed after each use.

7: To successfully program or remove additional codes, the panel must be put into the code program mode by following step one (Program light flashing) followed by steps 3 or 4. Note that if no key entry is made for 30 seconds the panel will go back to the normal arm/disarm mode. Step one must then be repeated to get back into the code program mode.

8: To exit the code program mode press [#].

SETTING AUTOMATIC ARMING TIME

1: The PC2000 can be programmed to automatically arm each day at the same time. To operate, auto-arming must be enabled (see "OTHER SYSTEM FEATURES" section).

2: To set the time, press [#], [6] and enter any valid security code (sounder will beep 3 times).

3: Enter two digits (from 01 to 23) for the number of hours until arming is to take place. For example if it is 3:00 pm and auto-arming is to take place at 8:00 pm enter 05 for the five hours between 3:00 pm and 8:00 pm.

4: Press [#] to return to the arm/disarm mode.

SPECIAL FUNCTION OUTPUT

1: The programmable output (PGM terminal) on the PC2000 can be made to activate by a command from the keypad. This output can be used for operating other devices such as; garage door opener, special lighting or door strikes. It could also be used to trip another alarm zone for special transmissions such as; transmission test, medical alert or late closing report.

2: The programmable output must be selected for keypad utility function by programming a 02 in location FEB.

3: The programmable output is activated by pressing the [#] and [7] keys. When the keys are pressed the keypad sounder and the programmable output are activated for 2 seconds.

PROGRAMMING OTHER SYSTEM FEATURES

- 1: Press the [*] and [8] keys then enter the master security code to enter the SYSTEM FEATURES programming mode. The "Program" light will start to flash and the sounder will beep 3 times.
- 2: To program the alarm entry timer, press [1] followed by two digits (01 to 99) for the entry time in seconds. On power up entry time is 30 seconds.
- 3: To program the alarm exit timer, press [2] followed by two digits (01 to 99) for the exit time in seconds. On power up exit time is 30 seconds.
- 4: To program the alarm cut-off time, press [3] followed by two digits (01 to 99) for the alarm cut-off time in minutes. On power up the alarm cut-off time is 4 minutes.
- 5: To enable or disable the "QUICK ARM" feature, press [4]. When the "QUICK ARM" is being enabled the sounder will beep 3 times. Pressing [4] again will disable "QUICK ARM" (sounder will give one long beep).
- 6: To enable or disable the "AUTO ARM" feature, press [5]. When the "AUTO ARM" is being enabled the sounder will beep 3 times. Pressing [5] again will disable "AUTO ARM" (sounder will give one long beep).
- 7: To enable or disable the "DOOR ALERT" feature, press [6]. When the "DOOR ALERT" is being enabled the sounder will beep 3 times. Pressing [6] again will disable "DOOR ALERT" (sounder will give one long beep).

AUTO-TEST TRANSMISSION

- 1: The PC2000 can be programmed to send a test code at the same time each day or night.
- 2: To set the time, press [*], [8] and enter the master security code (sounder will beep 3 times).
- 3: Enter two digits (from 01 to 23) for the number of hours until test code is to be transmitted. For example if it is 3:00 pm and auto-arming is to take place at 12:00 pm enter 09 for the nine hours between 3:00 pm and 12:00 pm.
- 4: Press [#] to return to the arm/disarm mode.

QUICK ARM

- 1: Quick Arm is a short form code which may be used to arm the PC2000. The quick arm feature must be enabled using the special features command in the "PROGRAMMING OTHER SYSTEM FEATURES" section.
- 2: To quick arm, check to see if the ready light is on then press [*] and [0].

DURESS

A duress code is an emergency code which is created by adding 1 to the last digit of the disarming security code. The control panel disarms normally and there is no difference noticeable from the keypad. However, the duress reporting code programmed in location FDB is sent instead of the disarm code.

Example: if normal security code is 1234
then duress security code would be 1235

KEYPAD ZONES

There are two zones which can be activated from the keypad. A fire alarm is activated by pressing the [1] and [3] keys at the same time. The fire alarm sounds the siren/bell in a pulsed mode, sends the transmission as zone 7 (the same as the "Aux. Zone") and annunciates the alarm memory as zone 7 on the keypad. The Police (or Panic) alarm is activated by pressing the [*] and [#] keys at the same time. The panic alarm is a silent alarm. There is no bell/siren signal and there is no annunciation from the keypad. The only action is the transmission of the panic code programmed in location FE3. Labels are included with PC2000-RK keypad to mark the two keypad zones.

PC2000 PROGRAMMING WORKSHEET

MASTER USER CODE

ADDRESS	DATA
F88	_ _
F89	_ _

EXAMPLE: FOR A MASTER CODE OF 1234 ENTER 12 IN ADDRESS F88 AND 34 IN ADDRESS F89. (USE DIGITS 0 TO 9 ONLY)

1ST TELEPHONE NUMBER

2ND TELEPHONE NUMBER

ADDRESS		DATA		ADDRESS		DATA	
		P	N			P	N
F8A		_ _	_ _	FEC		_ _	_ _
F8B		_ _	_ _	FED		_ _	_ _
F8C		_ _	_ _	FEE		_ _	_ _
F8D		_ _	_ _	FEF		_ _	_ _
F8E		_ _	_ _	FF0		_ _	_ _
F8F		_ _	_ _	FF1		_ _	_ _
FC0		_ _	_ _	FF2		_ _	_ _
FC1		_ _	_ _	FF3		_ _	_ _
FC2		_ _	_ _	FF4		_ _	_ _
FC3		_ _	_ _	FF5		_ _	_ _
FC4		_ _	_ _	FF6		_ _	_ _
FC5		_ _	_ _	FF7		_ _	_ _
FC6		_ _	_ _	FF8		_ _	_ _
FC7		_ _	_ _	FF9		_ _	_ _
FC8		_ _	_ _	FFA		_ _	_ _

N= TELEPHONE NUMBER DIGIT (ENTER 'A' TO DIAL ZERO. DO NOT ENTER 0 IN 'N'.)

P= PAUSE BEFORE DIGIT IS DIALED

-ENTER 'D' FOR DIAL TONE DETECTION

-ENTER '0' FOR NORMAL DIGIT

-ENTER '1' TO '9' FOR 1 TO 9 SECOND DELAY BEFORE DIGIT IS DIALED

CUSTOMER IDENTIFICATION CODE (DIGITAL COMMUNICATOR)

ADDRESS	DATA	
FC9	_ 0 _ _	ENTER DECIMAL OR HEX DIGIT (1...9 A...F). LEAVE ADDRESS 'FCC' UNPROGRAMMED FOR A 3 DIGIT CUSTOMER CODE. (enter Hex: "A" for 0)
FCA	_ 0 _ _	
FCB	_ 0 _ _	
FCC	_ _ _	

REPORTING CODES (DIGITAL COMMUNICATOR)

ZONE	ALARM CODES		RESTORAL CODES			
	ADDRESS	DATA		ADDRESS	DATA	
		1	2		1	2
ZONE1	FCD			FD5		
ZONE2	FCE			FD6		
ZONE3	FCF			FD7		
ZONE4	FDO			FD8		
ZONE5	FD1			FD9		
ZONE6	FD2			FDA		
ZONE7	FD3			AUX (SMOKE DETECTOR) LOOP		
ZONE8	FD4			KEYPAD DELAY LOOP (transmits same restoral code as zone 1)		

		1	2
DURESS	FDB		
DISARM	FDC		
ARM	FDD		
PARTIAL ARM	FDE		
LOW BATTERY	FDF		
AC FAILURE	FE0		
AC/BAT RESTORAL	FE1		
TROUBLE	FE2		
PANIC	FE3		
24 HR TEST	FE4		

- ENTER '0' FOR 1ST DATA NUMBER FOR SINGLE DIGIT REPORTING CODES
- ENTER 'A' FOR 2ND DATA NUMBER FOR ZERO (10 PULSES) REPORTING CODE
- ENTERING 'B' UP TO 'F' HEX IN DATA WILL REPORT 11 UP TO 15 PULSES
- LEAVE UNUSED CODES UNPROGRAMMED (DATA => 'FF')

ZONE DEFINITION (CONTROL PANEL)

	ADDRESS	DATA	
		R	T
ZONE1	FE5	:__:	__:
ZONE2	FE6	:__:	__:
ZONE3	FE7	:__:	__:
ZONE4	FE8	:__:	__:
ZONE5	FE9	:__:	__:
ZONE6	FEA	:__:	__:

R=LOOP RESPONSE TIME AND BELL SILENT OR AUDIBLE

- ENTER 0 FOR SLOW LOOP RESPONSE AND BELL AUDIBLE
- ENTER 1 FOR SLOW LOOP RESPONSE AND BELL SILENT
- ENTER 2 FOR FAST LOOP RESPONSE AND BELL AUDIBLE
- ENTER 3 FOR FAST LOOP RESPONSE AND BELL SILENT

T=ZONE TYPE

- ENTER 0 FOR DELAY CIRCUIT
- ENTER 1 FOR INSTANT CIRCUIT
- ENTER 2 FOR INTERIOR (INSTANT/DELAY OR FOLLOWER) CIRCUIT
- ENTER 3 FOR INTERIOR CIRCUIT WITH HOME AWAY
- ENTER 4 FOR 24 HOUR CIRCUIT (BELL ONLY)
- ENTER 5 FOR 24 HOUR CIRCUIT (BELL/BUZZER)
- ENTER 6 FOR 24 HOUR CIRCUIT (BUZZER ONLY)
- ENTER 7 FOR DOUBLE DELAY CIRCUIT

PROGRAMMABLE VOLTAGE OUTPUT

ADDRESS	DATA
FEB	:__:

- ENTER 00 FOR GROUND START PULSE
- ENTER 01 FOR BELL/SIREN FOLLOW MODE
- ENTER 02 FOR KEYPAD UTILITY FUNCTION(see keypad special function programming section)
- ENTER 03 FOR KEYPAD BUZZER FOLLOW MODE
- ENTER 04 FOR SYSTEM ARMED OUTPUT

COMMUNICATIONS MODE

ADDRESS

DATA

FFB

!__!__!

- ENTER 00 FOR NORMAL REPORTING
- ENTER 01 FOR EXTENDED REPORTING

ALARM RESTORAL DEFINITION

ADDRESS

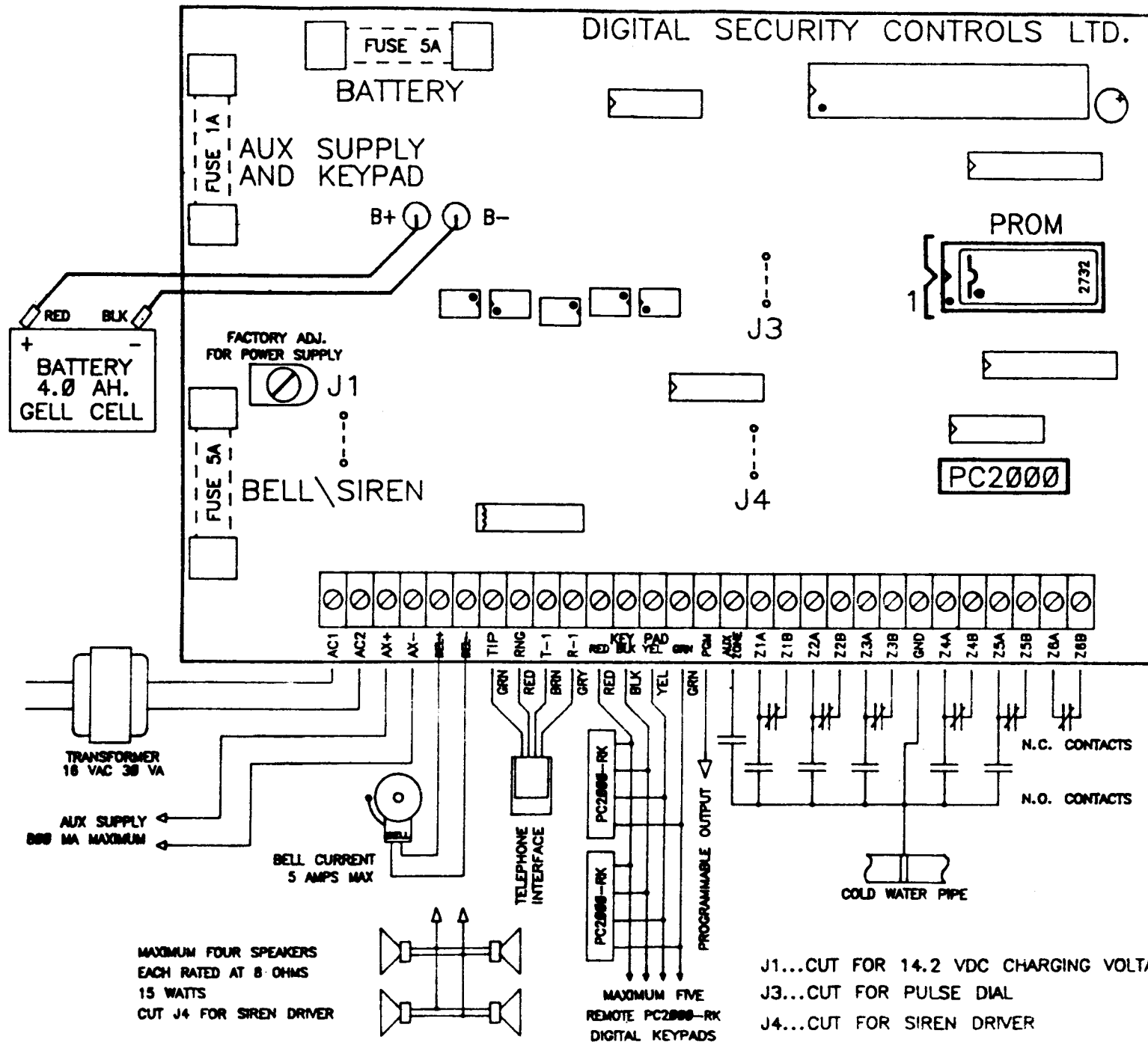
DATA

FFC

!__!__!

- ENTER 00 FOR RESTORAL TRANSMISSION WHEN BELL HAS TIMED OUT AND ZONE IS RESTORED.
- ENTER 01 FOR ZONE RESTORAL WHEN SYSTEM IS DISARMED (ONE ALARM PER ZONE DURING ARMED PERIOD)
- ENTER 02 FOR RESTORAL TRANSMISSION AS SOON AS ZONE IS RESTORED

DIGITAL SECURITY CONTROLS LTD.



- J1...CUT FOR 14.2 VDC CHARGING VOLTAGE
- J3...CUT FOR PULSE DIAL
- J4...CUT FOR SIREN DRIVER

MAXIMUM FOUR SPEAKERS
EACH RATED AT 8 OHMS
15 WATTS
CUT J4 FOR SIREN DRIVER

MAXIMUM FIVE
REMOTE PC2000-RK
DIGITAL KEYPADS