



# DSC 4050A

4 Zone Digital Dialer

The DSC 4050a must be used with the 2732 EPROM DSC4050a master chip. DSC 8000 dialers may be upgraded to operate with the DSC 4050a master chip by changing the jumper on the board from the 2716 to the 2732 position.

The Digital Security Controls DSC 4050a is a Micro-Computer based Digital Communicator. The DSC 4050a has 4 alarm input zones and is capable of reporting 21 alarm conditions including separate alarm and restore codes, low battery and 24-hour Self-Test. When used with receivers capable of receiving "HEX" codes the DSC 4050a can transmit 21 codes. It is compatible with and automatically selects the correct transmitting format for DCI, Ademco, Franklin, SESCOA and Silent Knight alarm receivers. It also can transmit 40 Baud Radionics format. The operating system, telephone numbers, account codes and alarm codes are stored in a re-usable 2732A EPROM which may be programmed by existing compatible programmers or with the Digital Security Controls EP-1 or EP-2 programmers.

## INSTALLATION INSTRUCTIONS

Mount the DSC 4050a communicator in the alarm control cabinet using the double sided foam tape provided or the mounting holes in the corners of the printed circuit board.

Wire all zone inputs to the DSC 4050a to provide the appropriate positive input voltages or contact closures as described in the section on Alarm Zone Inputs and in the connection diagram.

Connect approved telephone interconnect cable to the DSC 4050a as shown in the connection diagram. If telephone line is not intended for DTMF dialing cut jumper JMP2 to convert the DSC 4050a to pulse dialing. DO NOT plug the interconnect cable in yet.

Insert a programmed EPROM in the DSC 4050a board as shown in the connection diagram. The chip shipped with the unit is blank and must be programmed before the unit will operate. See the programming guide and programming worksheet included in this manual.

Connect the power supply to the + and - DC IN terminals. The line seizure relay and the off-hook LED should operate momentarily on applying power.

The DSC 4050a may be quickly checked for correct operation and programmed information before it is connected to the telephone network by using a DSC DTS-1 dialer test set. See DSC distributor for details.

Plug the interconnect cable into the telephone line jack supplied by the telephone company and proceed with testing alarm transmissions to the alarm receiver. If the DSC 4050a seizes the telephone line for a long period of time or if other difficulty is experienced in completing alarm transmissions, remove the interconnect cable and seek technical assistance from your equipment distributor or from Digital Security Controls.

#### SPECIFICATIONS

Dimensions:	3.5" x 5" (8.9cm x 12.7cm)
Input voltage:	11.5 to 14 VDC
Current:	
Stand by	125 mA
Transmitting	160 mA

#### ALARM ZONE INPUTS

Each of the 4 input zones requires a positive input voltage to trip. This can be done by applying a positive voltage directly to the input terminal or by closing a normally open contact between the input zone and the positive supply voltage to the DSC 4050a as shown in the connection diagram. All inputs have a 200 msec. delay. An alarm input signal must be present for this length of time before it is recognized. This delay minimizes false alarms due to transients.

Each alarm input has a separately programmable alarm and restore code. An all restored code may also be programmed. This code will be transmitted when all zones, which do not have an individual restore code programmed, have returned to the normal state.

#### PROGRAMMABLE VOLTAGE OUTPUTS

The DSC 4050a has a programmable voltage output. The output is a transistor switch to ground with a 25mA rating. See programming guide for options on output.

#### LOW BATTERY ALARM

The low battery alarm is created if the input supply voltage drops below 11 volts for more than 5 seconds. The alarm restoral is created as soon as the input voltage goes above 12 volts. The low battery alarm will not be transmitted if the low battery alarm or restoral code is not programmed. By using a programmable voltage output, a local low battery alarm may be generated whether or not low battery alarm transmission is selected.

#### LINE SEIZURE

The DSC 4050a has full line seizure to completely disconnect the house phones when the DSC 4050a is communicating.



## OFF-HOOK DIAL PULSE INDICATOR

The red LED indicator is on when the communicator searching for a dial tone, handshake or kiss-off signal.

## PROGRAMMING GUIDE

The DSC 4050a is shipped with a blank 2732a EPROM chip. This chip must be programmed using a DSC EP-1 or DSC EP-2 chip programmer, a DSC 4050a master chip and information from the completed DSC 4050a programming worksheet. The programming worksheet is included in this manual. See the EP-1 or EP-2 operating instructions for procedure.

The following headings in the programming guide correspond to headings in the programming worksheet.

## CUSTOMER IDENTIFICATION CODE

The customer identification code is sent by the communicator to identify, to the monitoring station, where the transmission is coming from.

Two customer I.D. codes can be programmed. One for each of the two telephone numbers. The first one must be programmed for the dialer to function. If the second one is not programmed but the second telephone number is programmed, the first customer I.D. code will be transmitted to both telephone numbers.

The customer I.D. code can be a 3 or 4 digit code. The code digits can be decimal digits (1 to 9) as well as hex digits (A to F). Where a "0" code digit is required use "A" for 10 pulses. The 1st data digit for each address is "0". The 2nd data digit at each address is the customer code digit.

For example to program a Customer I.D. of 102 for the 1st telephone enter:

ADDRESS	DATA
FB0	01
FB1	0A
FB2	02
FB3	

For a 3 digit code address "FB3" is left unprogrammed ( data is "FF").

## TELEPHONE NUMBERS

Two telephone numbers may be programmed into the EPROM. Only the first telephone number need be programmed. The second number is optional. There are 15 address locations for each telephone number. The 1st data

entry at each address ("P" or pause column in work sheet) represents the pause before the digit is dialed. The 2nd data entry at the same address ("N" or number column in work sheet) represents the number which is to be dialed.

Allowable entries for the "P" or pause column are:

- "0" for normal pause before dialing digit
- "1" to "9" for a 1 to 9 second delay before dialing digit
- "D" for dial tone detection before dialing digit

For most numbers to be dialed, a "D" before the first number and "0" before all other numbers in the telephone number is all that is necessary. Where one or two digits must be dialed in order to "dial out" before the telephone number is dialed, a "D" is required before the first access digit and another "D" is required before the 1st telephone number digit. When the dial tone is distorted or too weak to be recognized by the dial tone detection circuit, enter 5 up to 9 in the "P" column for a delay of between 5 and 9 seconds before dialing.

When entering the digits of the telephone number in the "N" column, use "A" where the telephone number digit is a "0".

For example to program a 1st telephone number of 665-8460 enter:

ADDRESS	DATA	TELEPHONE NUMBER
FB4	D6	6
FB5	06	6
FB6	05	5
FB7	08	8
FB8	04	4
FB9	06	6
FCA	0A	0

### COMMUNICATIONS MODE

There is one communications mode address for each telephone number. These addresses are "FC3" for the 1st telephone # and "FD7" for the 2nd telephone #. The 1st data entry at each address determines whether the dialer will transmit in normal or extended format to the receiver called by that telephone number.

Programming "0" for the 1st data entry causes transmission in normal single line format. Programming "1" causes transmission in extended format. 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 a 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.

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. In the 2nd line, the type of alarm is repeated followed by the number of the zone which caused the alarm.

The 2nd data entry at each address determines which transmitting format the dialer will use at that telephone number.

Entering "0" causes the communicator to automatically select the proper data transmission speed by listening to the initial handshake tone frequency. When a 1400 Hz handshake/kiss-off tone is sent by the receiver, the communicator transmits 1900 Hz data at 10 Baud. This is the slow format required for Ademco, Silent Knight, Adcor and Vertex receivers. When a 2300 Hz handshake/kiss-off tone is sent by the receiver, the communicator transmits 1800 Hz data at 20 baud. This is the fast format required for Sescoa, Franklin, DCI and Vertex receivers.

Entering "1" causes the communicator to transmit at 10 BAUD.  
Entering "2" causes the communicator to transmit at 20 BAUD.  
Entering "3" causes the communicator to transmit at 20 BAUD but with the 1400 Hz handshake/kiss-off tone normally associated with 10 Baud.  
Entering "4" causes the communicator to transmit at 40 BAUD for "Radionics" format.

Before programming the communications mode addresses, check with the monitoring station to determine the correct receiver format.

#### ZONE REPORTING CODES

The data entered in the reporting code addresses is transmitted along with the Customer I.D. Code to provide the monitoring station with information about what alarm or restoral conditions have occurred at the communicator.

All reporting codes may be one or two digits long in decimal digits (1 to 9) including hex-digits (A to F). Not all monitoring station receivers will accept two digit reporting codes and not all will accept hex codes. If a reporting code is one digit, the first data entry at a reporting code address is "0". "0" is never used as the second entry. A "0" reporting code is programmed as an "A" as in telephone number programming and Customer I.D. Code programming. If no transmission is wanted for any of the reporting codes those addresses must be left unprogrammed (data "FF").

The addresses for programming alarm and restoral codes for zone inputs 1 to 8 are "FD8" to "FDF" for alarm and "FE0" to "FE7" for restoral.

The "ALL" alarm transmission (program address "FEB") takes place when all 4 zone inputs have gone into alarm. The "ALL" restore transmission (program address "FE9") takes place when all 4 zones inputs are restored. In some applications the "ALL" restore code is used in

combination with individually programmed zone alarm codes to provide individual alarm codes and one common restore code. In the case where more than one zone goes into alarm, the restore code is transmitted when all zones are restored instead of after each individual zone restoral.

Low battery alarm and restoral codes are programmed at addresses "FEA" and "FEB". If the battery voltage drops below 11 volts for more than 5 seconds a low battery alarm is transmitted. When the voltage raises above 12 volts again a low battery restoral is transmitted.

A test code is transmitted every 24 hours when address "FEC" is programmed. The 1st transmission takes place 12 hours after the communicator is powered up and then every 24 hours after.

### ZONE SAMPLE RATE

The data programmed in address "FED" defines the "SAMPLE RATE" for all 4 zone inputs. The "SAMPLE RATE" equals the HEX number entered in address "FED" converted to decimal equivalent times 10 milliseconds. The total zone response time equals the "SAMPLE RATE" times the "SAMPLE COUNT". The "SAMPLE COUNT" is programmed individually for each zone input at addresses "FEE" to "FF5". The "SAMPLE COUNT" can range from 2 to 256. The zone response time for a sampling rate of 100msec. varies from 200 msec. (.2 seconds) to 25600 msec. (25.6 seconds). If a delay time longer than 25.6 seconds is required, a longer sampling rate can be programmed. If "HEX 14" (decimal 20) is programmed into "FED", the response time will range from .4 seconds to 51.2 seconds. The zone input must be present at the end of the delay time for the alarm to be recognized and the transmission to take place. If address "FED" is left unprogrammed or "FF", it is set by default to Hex "A" which is equal to 10 decimal. The default sample rate is therefore 10x10ms or 100msec.

### TRANSMISSION TELEPHONE NUMBER AND TRANSMISSION DELAY BY ZONE

This programming section has two purposes. The 1st data entry at each address defines where the transmission will be sent.

Enter 1, 2 or 3 as the 1st data entry at each address.

- 1= Dial to 1st telephone number with back up to 2nd telephone number if successful communication is not made to 1st number.
- 2= Dial to 2nd telephone number only.
- 3= Dial to both telephone numbers.

The 2nd data entry at each address defines the "SAMPLE COUNT" as described in the previous section. The total delay time before transmission is started or the zone response time is defined by the "SAMPLE RATE" times the "SAMPLE COUNT".

## PROGRAMMABLE VOLTAGE OUTPUT

There is one programmable voltage output. This is programmed as follows at address "FF9" .

- 00 To provide a 2 second Ground Start pulse before the communicator searches for dial tone.
- 01 On failure to communicate provides a 2 second pulse output.
- 02 On failure to communicate provides a maintained output which is reset by a positive input to zone 4. When zone 4 is connected to a voltage which goes positive on system arming, zone 4 provides "Opening" and "Closing" signals then failure to communicate output will reset on arming.
- 03 To provide a voltage output during the time the telephone line is seized by the dialer.
- 04 Low Battery indication
- 05 not used
- 06 "Ringback" - Two second pulse on completion of alarm or restoral transmission on zone 4.
- 07 Can be used to provide 2nd telephone line access. Output switches on when the second telephone number is dialed.

DSC 4050a PROGRAMMING WORKSHEET

CUSTOMER IDENTIFICATION CODE

ENTER DECIMAL OR HEX DIGIT(1...9 A...F). LEAVE ADDRESSES "FB3" AND "FC7" UNPROGRAMMED FOR 3 DIGIT CUSTOMER CODES. (enter Hex "A" for 0)

CUSTOMER I.D. FOR  
1ST TELEPHONE NUMBER

CUSTOMER I.D. FOR  
2ND TELEPHONE NUMBER

ADDRESS	DATA
FB0	0   _
FB1	0   _
FB2	0   _
FB3	_   _

ADDRESS	DATA
FC4	0   _
FC5	0   _
FC6	0   _
FC7	_   _

TELEPHONE NUMBERS

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

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

1ST TELEPHONE NUMBER

2ND TELEPHONE NUMBER

ADDRESS	DATA	
	P	N
FB4	_	_
FB5	_	_
FB6	_	_
FB7	_	_
FB8	_	_
FB9	_	_
FBA	_	_
FBB	_	_
FBC	_	_
FBD	_	_
FBE	_	_
FBF	_	_
FC0	_	_
FC1	_	_
FC2	_	_

ADDRESS	DATA	
	P	N
FC8	_	_
FC9	_	_
FCA	_	_
FCB	_	_
FCC	_	_
FCD	_	_
FCE	_	_
FCF	_	_
FD0	_	_
FD1	_	_
FD2	_	_
FD3	_	_
FD4	_	_
FD5	_	_
FD6	_	_



## COMMUNICATIONS MODE

FOR 1ST TELEPHONE #

FOR 2ND TELEPHONE #

ADDRESS

DATA

ADDRESS

DATA

1 2

1 2

FC3

: \_\_\_ : \_\_\_ :

FD7

: \_\_\_ : \_\_\_ :

1ST DATA DIGIT

0= NORMAL REPORTING

1= EXTENDED REPORTING

2ND DATA DIGIT

0= 10/20 BAUD AUTO SELECTION

1= 10 BAUD ONLY

2= 20 BAUD ONLY

3= 20 BAUD INVERTED

4= RADIONICS 40 BAUD ROUNDS

5= RADIONICS 40 BAUD WITH PARITY

6= SESCOA 40 BAUD SUPER FAST (SEE APPLICATION BRIEF

AB 100 FOR PROGRAMMING DETAILS)

## ZONE REPORTING CODES

ZONE

ALARM CODES

RESTORAL CODES

ADDRESS

DATA

ADDRESS

DATA

1 2

1 2

ZONE1

FDB

: \_\_\_ : \_\_\_ :

FE0

: \_\_\_ : \_\_\_ :

ZONE2

FD9

: \_\_\_ : \_\_\_ :

FE1

: \_\_\_ : \_\_\_ :

ZONE3

FDA

: \_\_\_ : \_\_\_ :

FE2

: \_\_\_ : \_\_\_ :

ZONE4

FDB

: \_\_\_ : \_\_\_ :

FE3

: \_\_\_ : \_\_\_ :

ALL

FEB

: \_\_\_ : \_\_\_ :

FE9

: \_\_\_ : \_\_\_ :

LOW BATTERY

FEA

: \_\_\_ : \_\_\_ :

FEB

: \_\_\_ : \_\_\_ :

TEST CODE

FEC

: \_\_\_ : \_\_\_ :

## ZONE SAMPLE RATE

ADDRESS

DATA

FED

: \_\_\_ : \_\_\_ :

Defines the zone sampling period. Each count represents 10 ms. Normal setting programmed into master chip is: "HEX A" = 10 10x10ms = 100ms



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TRANSMISSION TELEPHONE NUMBER AND TRANSMISSION DELAY BY ZONE

	ADDRESS	DATA	
		1	2
ZONE 1	FEE	__	__
ZONE 2	FEF	__	__
ZONE 3	FF0	__	__
ZONE 4	FF1	__	__
ALL	FF6	__	__
LOW BATTERY	FF7	__	__
24 HR TEST	FF8	__	__

1ST DATA DIGIT= WHICH TELEPHONE NUMBER IS DIALED

- 1= 1ST NUMBER WITH BACK UP TO 2ND NUMBER
- 2= 2ND NUMBER ONLY
- 3= BOTH NUMBERS

2ND DATA DIGIT=SAMPLE COUNT (Number of sample times for which input must be present before alarm is recognized.)

TOTAL ZONE RESPONSE TIME:

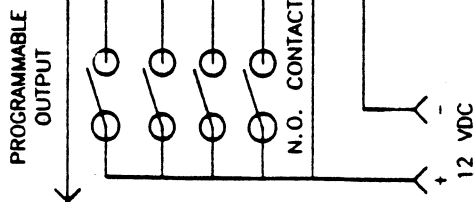
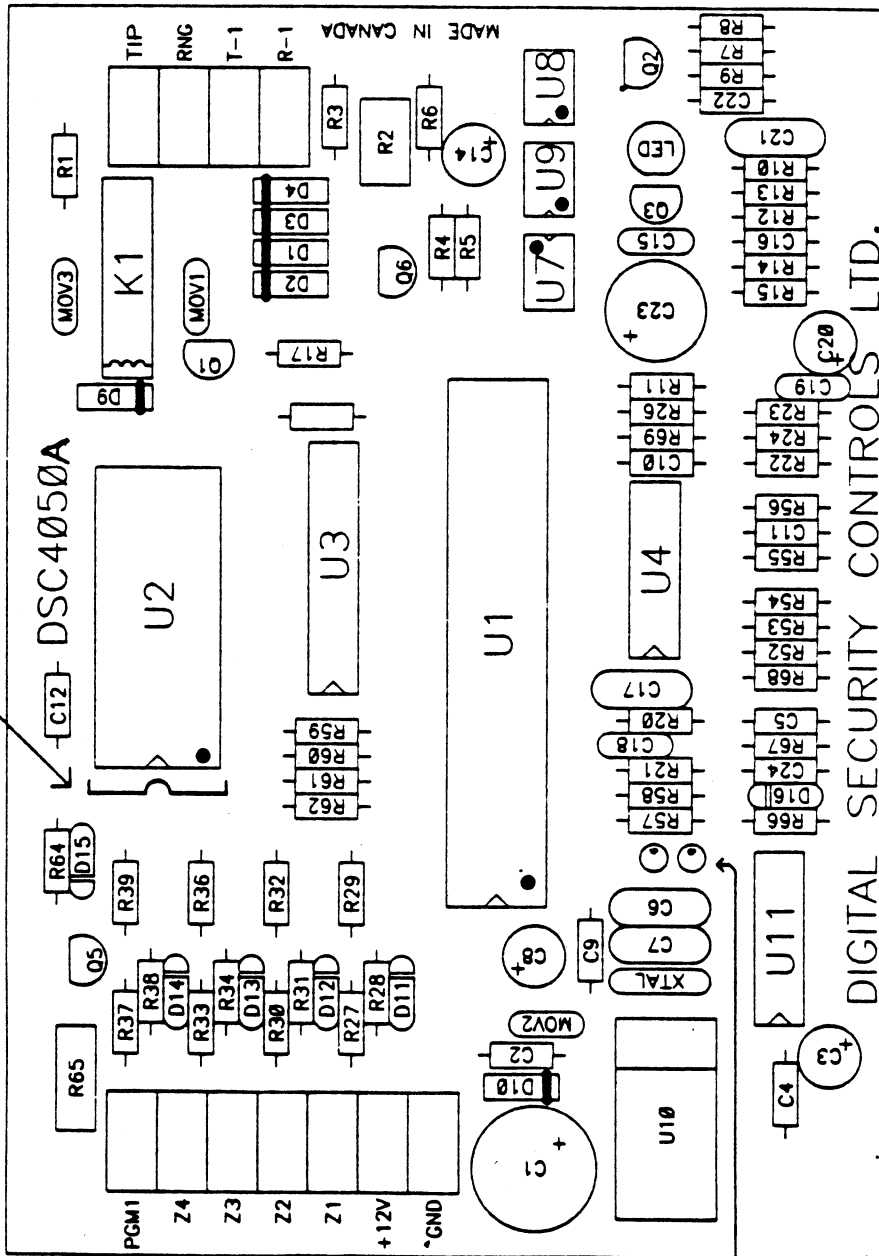
- 1= ZONE SAMPLE TIME x2
- 2= ZONE SAMPLE TIME x4
- 3= ZONE SAMPLE TIME x8
- 4= ZONE SAMPLE TIME x16
- 5= ZONE SAMPLE TIME x32
- 6= ZONE SAMPLE TIME x64
- 7= ZONE SAMPLE TIME x128
- 8= ZONE SAMPLE TIME x256

PROGRAMMABLE VOLTAGE OUTPUT

	ADDRESS	DATA
FGM1	FF9	__ __

00=Ground Start 01=Fail To Communicate(Pulse) 02=Fail To Communicate (transition of zone 4) 03=Line Seizure 04=Low Battery 05=not used 06=ringback on zone 4 07=2ND telephone number access

INSERT EPROM  
AS SHOWN



CUT FOR  
PULSE DIAL

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