APPLICATION EXAMPLE
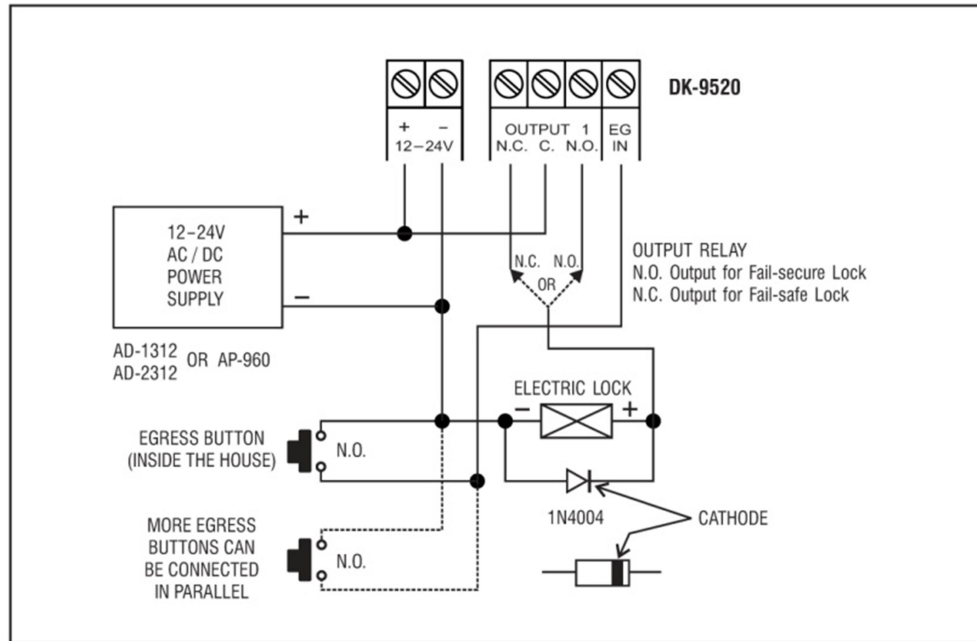
BASIC WIRINGS OF A STAND ALONE DOOR LOCK

NOTE:

* Connect the 1N4004 as close as possible to the lock in parallel with the lock power terminals to absorb the back EMF to prevent it from damaging the keypad. The 1N4004 is not required if the electric lock is AC operated.

* To avoid Electro-Static-Discharge from interfering with the operation of the keypad, always ground the (−) terminal of the keypad to earth.

SELF-CONTAINED

DIGITAL ACCESS CONTROL KEYPAD
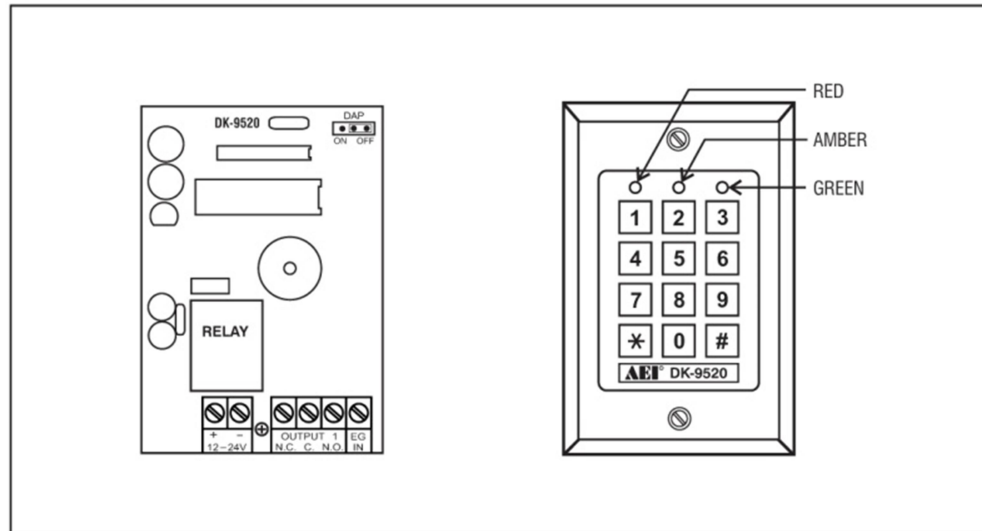

DK-9520

Programming & Installation Manual

FOR ELECTRIC LOCK INSTALLATION

INTRODUCTION

DK-9520 is an universal, self-contained digital access keypad offers field proven reliability and cost effective solutions for residential and commercial installations. It is designed for stand alone electric lock that operates from a 12 to 24V AC/DC power supply and virtually compatible with any electric locking device.

DK-9520 consists two application softwares of Single User Mode for the general Users, and Multi-User Mode for the advanced Users. The system offers a 4 digit length user code with 10,000 combinations in single user mode; and 100 user codes in length of 4-8 digits with combinations of more than 100 million in multi-user mode. Independent door lock inhibit authorization code is also available to control the operation of the keypad. Operation options of Auto Code entry and Manual Code entry are available in both two user modes. Programmed information that stored in the system are non-volatile in power failure.

CONNECTION TERMINALS

- **12–24V AC/DC** (POWER INPUT)

  Connect to 12-24V AC or DC power supply. The (−) supply is the common grounding point of the keypad system. No selection jumper is required for the full input voltage range.

  Connect DC power with the (+) and (−) polarity indicated; and there is no polarity discrimination for AC power input.

- **OUTPUT 1** (RELAY OUTPUT)

  5 Amp relay dry contacts, recommended for door strike controls. Normally Open (N.O.) and Normally Closed (N.C.) outputs are available. Use N.O. output for Fail-secure locking device and N.C. output for Fail-safe locking device. The relay can be programmed in Start/Stop (toggle) mode or timer mode from 1 to 999 seconds.

- **EG IN** (EGRESS INPUT)

  A Normally Open (N.O.) input terminal refers to (−) ground, with the help of a normally open button to activate the Output 1 for the same time period as the user code. Egress button is usually put inside the house near the door. More than one egress buttons can be connected in parallel to the terminal. Leave this terminal open if it is not used.

e) Try to put some random false codes to the keypad to test its Safety. The keypad generates 5 beeps for each unsuccessful code entry. The keypad locks itself during 15 minutes after 10 successive false codes are entered. Normal operation will resume after 15 minutes expired, or, it can be reset with the Master Code during the locking period.

  3 2 8 9 # ------ Locking is reset and keypad resumes normal operation

D) DELETE USER (MULTI-USER MODE)

If you need to delete a user who has left the company or who no longer has authority to enter the protected area:

1) Set system in programming mode with the Personal Master Code and the * key

   3 2 8 9 * ------------ The keypad is now in the programming mode

2) Enter the User Number (00-99 for output relay; 0-9 for authorization code) and the # key to delete a user code

   If you want to delete User Number 05, press 1 0 5 #

   If you want to delete User Number 03, press 1 0 3 #

   If you want to delete Authorization code 1, press 2 1 #

3) You may delete other user code(s) in this fashion

4) Exit the programming mode by pressing the * key after the work is done

SPECIFICATIONS

- **Operation Voltage:**
  12V–24V AC/DC, No Jumper is Required for voltage selection

- **Operation Modes:**
  a) Single User Mode, Auto, or Manual Code Entry
  b) Multi-User Mode, Auto or Manual Code Entry

- **User Code Combinations:**
  a) Single User Mode -- 10,000
  b) Multi User Mode --- 111,110,000
     Output 1 --- 100 user codes for door open (user number 00-99)
     Output 2 --- 10 user codes for Inhibit Authorization Control (user number 0-9)

- **Egress Input:**
  Normally open referring to (−) ground

- **Relay Output Contacts:**
  Normally Closed and Normally Open Dry Contacts, 5A / 30VDC Max. Rating

- **Auto Refreshing Time During Code Entry:**
  a) Each Digit Maximum Entry Time Limit -- 10 seconds
  b) Each Code Maximum Entry Time Limit -- 30 seconds

- **Dimensions:** 117(H) x 74(W)mm X 48(D)mm

- **Weight:** 160g net

Specifications are subject to change for modification without notice

2) Programming -- Set the above requirement into the keypad

`0` `0` `0` `0` `*` -------------------- System has been set in programming mode with the factory-set Master Code

`8` `9` `0` `1` `#` -------------------- System has been set for Multi User Mode** (please see NOTE (a) below)

`0` `3` `2` `8` `9` `#` -------------- 3289 has been stored as the new Personal Master Code & Super User Code

`1` `0` `1` `8` `3` `2` `1` `#` ------ 8321 has been stored as the 1st User Code for door open

`1` `0` `2` `1` `1` `2` `2` `3` `#` --- 11223 has been stored as the 2nd User Code for door open

`1` `0` `3` `3` `3` `2` `2` `1` `#` --- 33221 has been stored as the 3rd User Code for door open

`2` `1` `6` `8` `5` `4` `#` --------- 6854 has been stored as Authorization Code for inhibit control

`4` `0` `1` `#` --------------------- Output Relay has been set to Momentary Mode, 1 second for door strike

`5` `1` `#` ------------------------- Inhibit Authorization Control in Start / Stop Mode

`7` `2` `1` `0` `#` ----------------- The keypad has been set to lock during 15 minutes after 10 successive false codes

`*` -------------------------------- Keypad exits programming mode. All the above data are stored and ready for use

NOTE: a) **Enter the Multi User Mode Command Code "8901" may not be necessary if the keypad was already in Multi User Mode.

b) In case of wrong entry during programming, cancel it with `#` key, or, wait 10 seconds, then re-try.

---

3) Operate The Keypad -- Taking the data programmed above and other features in default values as reference

a) To command output 1, enter any one of the User Codes in Group 1 and validate via the `#` key

`8` `3` `2` `1` `#` ------ Output Relay activates for 1 second

`1` `1` `2` `2` `3` `#` --- Output Relay activates for 1 second

`3` `3` `2` `2` `1` `#` --- Output Relay activates for 1 second

b) To command Authorization Control, enter the Authorization Code and validate via the `#` key

`6` `8` `5` `4` `#` ------ Authorization Control Start / Stop

c) The Personal Master Code is a Super User Code to command the relay output and also make operation authorization control as like an authorization code for the keypad. This feature allows the owner to use only one code to operate two functions. Enter the Personal Master Code and validate via `#` and the corresponding function code.

`3` `2` `8` `9` `#` `1` --- Output Relay activates for 1 second

`3` `2` `8` `9` `#` `2` --- Authorization Control Start / Stop (if programmed)

d) The Accelerated Code is the First Two Digits of the User code(s). If the Relay Output has been programmed in Start / Stop mode with Accelerated Code (Programming Option 42), it is possible to activate the Relay Output with only the First Two Digits of the User Code(s). Deactivating of the Output always requires the composition of the Complete User Code(s).

Example:
Output Relay has been re-programmed to Start / Stop Mode with Accelerated Code (Programming Option 42) with the Complete Code of 1st User Code in Group 1: **8321**   The Accelerated Code is: **83**
2nd User Code in Group 1: **11223**   The Accelerated Code is: **11**

`8` `3` `#` ------------- Output Relay starts

`8` `3` `2` `1` `#` ------ Output Relay stops

`1` `1` `#` ------------ Output Relay starts

`1` `1` `2` `2` `3` `#` --- Output Relay stops

THE LED INDICATORS

- **RED** (INHIBIT)

  It lights up if the operation of output relay is inhibited. Please see "Door Lock Inhibit Authorization" for more details.

- **AMBER** (MAINS)

  This is a status indicator. Its signal is in synchronization with the pacifier tones from the built-in buzzer. Please see the Chart below for the indication details.

- **GREEN** (DOOR)

  It lights up during the time that output relay is active.

THE PACIFIER TONES & THE LED INDICATING SIGNALS

The built-in buzzer and the amber LED indicator give the following tones and signals for operation status:

STATUS	TONES *	LED SIGNALS
1. In programming mode	- - -	ON
2. Successful key entry	1 Beep	1 Flash
3. Successful code entry	2 Beeps	2 Flashes
4. Unsuccessful code entry	5 Beeps	5 Flashes
5. DAP jumper not replaced	Continuous Beeps	Continuous Flashes
6. In standby mode	- - -	1 Flash in 2 seconds interval
7. Output relay activated	1 second Long Beep **	- - -

NOTE: * All Pacifier Tones can be enabled or disabled through programming options at Location 83.

** The Output Activation Beep can be enabled or disabled through programming options at Location 82.

THE DAP JUMPER (**D**IRECT **A**CCESS TO **P**ROGRAMMING)

If the Personal Master Code is forgotten, use the DAP jumper to override the forgotten code permitting the keypad direct entry into programming mode. You are required to apply the following procedures precisely.

1. Disconnect power supply.

2. Displace the DAP jumper from OFF to ON position.

3. Reconnect power supply (buzzer is activated).

4. Put the DAP jumper back to OFF position (this done, the buzzer is de-activated).

5. The keypad is in programming mode and ready to receive new programming data.

6. As the old master code was forgotten, suggest you to put a 4 digit new master code into Location 0 first.

7. Enter the new programming data starting from Section (B) in the summary chart shown below.

THE FACTORY-SET MASTER CODE -- IMPORTANT NOTE

For the owner's convenience in programming at the first time, the factory has put a Master Code 0000 into the keypad. To compromise security, in all cases, the owner should program a Personal Master Code to invalidate the factory-set Master Code before use.

PROGRAMMING OPTIONS -- SUMMARY CHART

A) Use The Factory-set Master Code to Entry in Programming -- When starts for the first time

Entry of Code	Validation	Comments
`0` `0` `0` `0`	`*`	Set system into Programming Mode with the Factory-set Master Code

B) Set System to Single User or Multi User Mode & Refresh The System -- Installer Programming

User Mode Options	Validation	Comments
`8` `9` `0` `0`	`#`	Set system to Single User Mode, clear all the data previously stored and refresh system
`8` `9` `0` `1`	`#`	Set system to Multi User Mode, clear all the data previously stored and refresh system

C) Recording of Personal Master Code & User Codes -- User Programming

i) Recording of the master code and user codes for Single User (Digits may be repeated)

Locations	Entry of Codes	Validation	Comments
`0`	4 digits, fixed	`#`	Personal Master Code & Super User Code
`1`	4 digits, fixed	`#`	User Code for relay output for door open
`2`	4 digits, fixed	`#`	Authorization Code for door lock operation inhibit contol

ii) Recording of the master code and user codes for Multi-User (Digits may be repeated)

Locations	User Number	Entry of Codes	Validation	Comments
`0`		4 to 8 digits	`#`	Personal Master Code & Super User Code
`1`	00 to 99	4 to 8 digits	`#`	100 User Codes in Group 1 for relay output for door open, user number from 00 to 99
`2`	0 to 9	4 to 8 digits	`#`	10 Authorization Codes for door lock operation inhibit control

D) Configuration of Output Modes -- Installer Programming

Locations	Code of Duration	Validation	Comments
`4` `0`	1 to 999	`#`	Output relay in Momentary Mode from 1 to 999 seconds
`4` `1`		`#`	Output relay in Start / Stop Mode (toggle)
`4` `2`		`#`	Output relay in Start / Stop Mode (toggle) with accelerated code
`5` `0`	1 to 999	`#`	Authorization Control from 1 to 999 seconds
`5` `1`		`#`	Authorization Control in Start / Stop Mode (toggle)
`5` `2`		`#`	Authorization Control in Start / Stop Mode (toggle) with accelerated code

NOTE: a) **Enter the Single User Mode Command Code "8900" may not be necessary if the keypad was already in Single User Mode.

b) In case of wrong entry during programming, cancel it with `#` key, or, wait 10 seconds, then re-try.

3) Operate The Keypad -- Taking the data programmed above and other features in default value as reference

a) To command an output, only enter its user code. Press `#` is NOT required.

`8` `3` `2` `1` ---------- Output Relay activates for 1 second

`6` `8` `5` `4` ---------- Authorization Control Start or Stop

b) The Personal Master Code is a Super User Code to command the relay output and also make operation of authorization control as like an authorization code for the keypad. This feature allows the owner to use only one code to operate two functions. Enter the Personal Master Code and validate via `#` and the corresponding function code.

`3` `2` `8` `9` `#` `1` --- Output Relay activates for 1 second

`3` `2` `8` `9` `#` `2` --- Authorization Control Start / Stop (if programmed)

c) The Accelerated Code is the First Two Digits of the User Code. If Output Relay has been programmed in Start / Stop mode with Accelerated Code at Location 42, it is possible to activate the Output Relay with only the First Two Digits of the User Code. Deactivating of the Output Relay always requires the composition of the Complete User Code.

Example: Output Relay has been re-programmed to Start / Stop Mode with Accelerated Code (Location: 42) with the Complete Code of: **8321** The Accelerated Code will be: **83**

`8` `3` `#` ------------- Output Relay starts

`8` `3` `2` `1` ----------- Output Relay stops

d) Try to put some random false codes to the keypad to test its Safety. The keypad considers 4 digits as one code and it generates 5 beeps for each unsuccessful code entry. The keypad locks itself during 15 minutes after 10 successive false codes. Normal operation will be resumed after 15 minutes expired, or, it can be reset with the Master Code during the locking period.

`3` `2` `8` `9` `#` ------ Locking is reset and keypad resumes normal operation.

C) MULTI-USER MODE OPERATION -- An Example

1) Requirement

a) Multi-User Mode Operation

b) Change the factory-set Master Code 0000 to a Personal Master Code 3289

c) Set 1st User Code of 8321 for door open

d) Set 2nd User Code of 11223 for door open

e) Set 3rd User Code of 33221 for door open

f) Set an Authorization Code of 6854 for inhibit control

g) Set Output Relay to Momentary Mode, 1 second for door strike

h) Set Inhibit Authorization Control in Start / Stop Mode

i) Set the keypad to lock itself during 15 minutes after 10 successive false codes

PROGRAMMING AND USE OF THE KEYPAD -- OPERATION EXAMPLES

A) PROCEDURES OF PROGRAMMING

a) All programming is accomplished entirely from the front of the keypad. The keypad may be programmed in your shop or at the installation site. Programmed information is stored in non-volatile memory so it will not be lost if power is removed.

b) When programming is required. It is necessary to set the keypad into programming mode first with the master code and validating it with ⁎ key.

| MASTER CODE | ⁎ |

NOTE: If the master code is forgotten, please use DAP jumper to set the keypad into programming mode. See DAP JUMPER description in previous section for the details.

c) After the keypad is in programming mode, you may go to any Location for your programming options one by one, please see Programming Options Summary Chart for the feature details.

d) You may make continuous programming until all desired options are programmed. Repeated programming at the same Location is allowed if the previous entry was mistaken.

| LOCATION 1 | OPTION | # |
| LOCATION n | OPTION n | # |

e) Exit programming mode with the ⁎ key after all your required options are programmed. The new information that you have just programmed is saved.

⁎

B) SINGLE USER MODE OPERATION -- An Example

1) Requirement

a) Single User Mode Operation
b) Change the factory-set Master Code 0000 to a Personal Master Code 3289
c) Set User Code of 8321 for door open
d) Set an Authorization Code of 6854 for inhibit control
e) Set Output Relay to Momentary Mode, 1 second for door strike
f) Set Inhibit Authorization Control in Start / Stop Mode
g) Set the keypad to lock itself during 15 minutes after 10 successive false codes

2) Programming -- Set the above requirement into the keypad:

`0 0 0 0 ⁎` ------- System has been set in programming mode with the factory-set Master Code

`8 9 0 0 #` ------- System has been set for Single User Mode** (please see NOTE (a) below)

`0 3 2 8 9 #` -- 3289 has been stored as the new Personal Master Code & Super User Code

`1 8 3 2 1 #` -- 8321 has been stored as User Code, for door open

`2 6 8 5 4 #` -- 6854 has been stored as Authorization Code for inhibit control

`4 0 1 #` --------- Output Relay has been set to Momentary Mode, 1 second for door strike

`5 1 #` ------------- Inhibit Authorization Control in Start / Stop Mode

`7 2 1 0 #` ----- The keypad has been set to lock during 15 minutes after 10 successive false codes

`⁎` ---------------------- Keypad exits programming mode. All the above data are stored and ready for use

E) Personal Safety -- Installer Programming

Locations	No. of False Entry	Validation	Comments
7 0		#	After 10 successive false codes, the keypad locks during 30 seconds
7 1		#	After 10 successive false codes, the Duress output switches to ground
7 2	5 to 10	#	Selectable of after 5 to 10 successive false codes, the keypad locks during 15 minutes. The keypad can be reset to release locking with the Master Code at any time during the locking period
7 6	00	#	Disappearance of all the above securities

F) Output Activation Announcer -- Installer Programming

Locations	Code of Functions	Validation	Comments
8 1	1	#	1 second notifying beep is given to notify the person outside to open the door when output relay is activated with an user code or egress button. Good for the locking device that gives no sound when it activates, such as a magnetic lock.
8 1	0	#	Notifying beep disabled and replaced by 2 short successful code entry beeps for valid user codes

G) User Code Entry Mode (Auto or Manual) -- Installer Programming

Locations	Code of Functions	Validation	Comments
8 2	1	#	Auto Entry Mode is selected. # key that follows the user code is NOT required in code entry. The User Codes MUST be set in the same digit length as the Master Code in Auto Entry Mode and the code length can be 4-8 digits
8 2	0	#	Manual Entry Mode is selected. # key that follows the user code is required in code entry. The user codes can be 4-8 digits and they are not required to be in the same length as the Master Code

NOTE: In Single User Mode, no matter the selection is Auto or Manual mode, the Master Code and the User Code MUST be set in the length of 4 digits.

H) Pacifier Tones (Keypress Acknowledgement Tones) -- Installer Programming

Locations	Code of Functions	Validation	Comments
8 3	1	#	Pacifier tones available on keypress
8 3	0	#	All pacifier tones are inhibited. Good for place requires silent environment

I) Exit Programming Mode

Validation	Comments
⁎	Keypad exits programming mode and returns to normal operation

SINGLE USER MODE OR MULTI-USER MODE SELECTION

The keypad consists two sets of software for owner's selection in user code programming. They are "Single User Mode" and "Multi-User Mode".

The keypad has been set with a Master Code of "0000" and in Single User Mode at the factory. If your required mode is Multi-User, you have to refresh the system with the appropriate comment code, 8901, to set it into Multi-User Mode.

Single User Mode (Command Code: 8900)

Single User Mode is prepared for the simple users, which allows only one user code to operate the output relay. The user codes are fixed to 4 digits and 10,000 code combinations are possible. User code can be programmed directly into the User Code Location 1. Please see Programming Summary Chart Section (C), item i) for details.

This mode is always set with Auto Code Entry in default. The user does not require to press the [#] key in user code entry. The user only needs to enter the 4 digit user code. The relay will activate for the programmed time.

NOTE: The system can be set for Manual Entry with programming option 0 at Location 82 if required.

Multi-User Mode (Command Code: 8901)

Multi-User Mode allows up to 100 individual user codes to operate the output relay. The user codes can be 4 to 8 digits with over 100 million code combinations. The user codes can be set for Auto Entry or Manual Entry with programming options at Location 82. As Manual Entry Mode is in default. The user code followed by [#] key is required.

Once the keypad is programmed in Auto Entry, the Master Code and the User Codes MUST be set in the same digit length, and the need for the user code not to be followed by [#] key is required.

The Default Values

Default Values	Comments
401	Output Relay in 1 second Momentary Mode
70	After 10 successive false code, the keypad locks during 30 seconds
811	Output relay activation beep ON
820	User code Manual Entry Mode ** (For Multi-User Mode)
821	User code Auto Entry Mode ** (For Single-User Mode)
831	Pacifier Tones ON

NOTE: ** The default values in Multi-User Mode and Single User Mode are exactly the same except the User Code Entry Mode.

Code Entry Limitation in Multi-User Mode due to Duress Code

This simplified version of keypad comes without Duress function but the system was designed to set up the Duress Code by itself automatically with the first digit of the User Code "+2". To prevent the other User Codes fall into the Duress Code, or the Duress Codes fall into other User Codes, the first digit of a "Stored" User code "+2" or "-2" is not allowed for the later User Code entry in programming. The system will refuse those code entries.

For example: An User Code 56789 was stored in the system, then 36789 and 76789 are not allowed for other User Codes.

SET THE SYSTEM TO SINGLE USER MODE

The system can be set to Single User Mode with the command code "8900" and will stay in that mode until the system is refreshed for other mode. Make sure that the Master Code was already in 4 digits before setting system to Single User Mode.

[MASTER CODE] [∗] [8][9][0][0] [#] ----- Single User Mode on Duty (please wait 2-3 seconds until the confirmation beeps are heard after the [#] key is pressed)

SET THE SYSTEM TO MULTI-USER MODE

The system can be set to Multi Users Mode with the command code "8901" and will stay in that mode until the system is refreshed for other mode.

[MASTER CODE] [∗] [8][9][0][1] [#] ----- Multi-User Mode on Duty (please wait 2-3 seconds until the confirmation beeps are heard after the [#] key is pressed)

REFRESH THE SYSTEM -- WHEN IN CHANGE OF OPERATION MODE

The system can be changed from Single User Mode to Multi-User Mode; or vice versa with the above operation command codes.

When this is done, the keypad will reset itself as a fresh unit with the default values; and all the programmed data that stored previously will be cleared except the Master Code.

IMPORTANT NOTES:

1) Make sure the User Code, Authorization Code and Master Code are in the length of 4 Digits if the system is in Single User Mode operation. Otherwise, code entry will not be accepted.

2) It is necessary to change the Master Code in the length of 4 digits first (no matter it was in 4 digits or more than 4 digits in Multi- User Mode) before refreshing it from Multi-User Mode to Single User Mode.

3) The system takes approximate 2 to 3 seconds to refresh itself for the new operation mode after the command code is entered. DO NOT enter any code during the system is being refreshed until the 2 confirmation beeps are heard.

DOOR LOCK INHIBIT AUTHORIZATION

This is an optional feature of the system. An authorization code can be set up for the keypad to control its operation. The owner may key in the code to temporarily stop the electric lock in the night time or after office hour with nobody inside the house to prevent unauthorized access.

The authorization code is for disabling or enabling the operation of the keypad output. The Red LED is ON for keypad output disabled and it is OFF while the keypad is in normal manner for door strike.

The following are the procedures of setting up the authorization code:

1) Set system in Programming Mode

[MASTER CODE] [∗]

2) Set an Authorization Code of your own

   a) If in Single User Mode (The Authorization code is 4 digits)

   [2] [AUTHORIZATION CODE] [#]
   4 DIGITS

   b) If in Multi-User Mode (The Authorization code can be 4-8 digits)

   [2] [1] [AUTHORIZATION CODE] [#]
   4-8 DIGITS

3) Set the Authorization Code in Start / Stop Mode

   [5] [1] [#]

4) End of Programming

   [∗]

```
WARNING
* FOR SAFETY, MAKE SURE
  NOBODY INSIDE THE HOUSE
  BEFORE YOU START THE DOOR
  LOCK INHIBIT FUNCTION. THE
  LOCK LOCKS ALL THE TIME
  DURING "INHIBIT" IS ON DUTY.

* THE INHIBIT AUTHORIZATION
  CODE SHOULD ALWAYS BE KEPT
  BY THE OWNER BUT NOT OTHER
  USER(S).
```