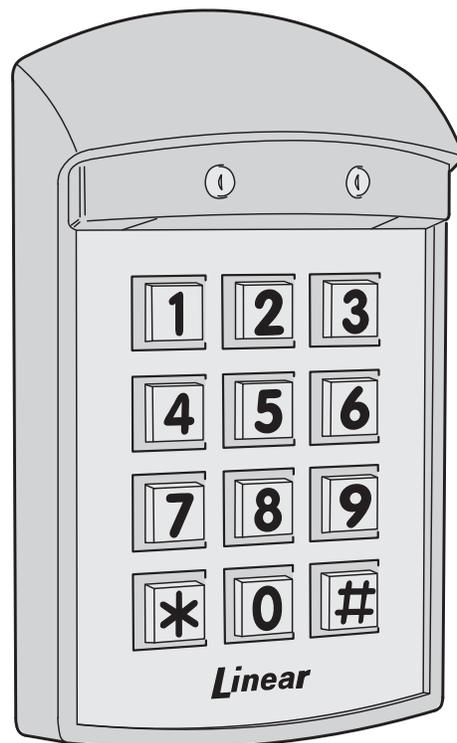# LinearACCESS

AK-21W

Weather Resistant Digital Keyless Entry System

Installation and Programming Instructions

Linear®

CONTENTS

INTRODUCTION

Linear's AK-21W is a digital keyless entry system designed for access control applications. The keypad is housed in a rugged, die-cast metal enclosure and is designed to be mounted in a single-gang electrical box. The die-cast keys have bright, easy-to-read yellow graphics.

Up to 480 entry codes, from 1 to 6 digits in length, can be programmed. They can activate either, or both, of the relay outputs. The "anti-passback" feature prevents using the same code again before the programmed time elapses.

All system indicators and lights are long-lasting, solid-state LEDs. Two indicators show the status of the entry system. The left indicator lights red to indicate power, then turns green when access is granted. The right indicator lights yellow when the keypad is in "lockout" condition (from too many incorrect code entries). The keypad's courtesy light dimly illuminates the keys at all times. The courtesy light brightly illuminates the keys for two minutes after any key is pressed. An internal sounder beeps when each key is pressed. An internal jumper sets the sounder volume high or low.

The **SENSE** input can be used two ways. If programmed for "door sense" the input is wired to a normally closed switch on the door to detect when the door is open or closed. Forced entry or door ajar situations can then be detected. Using door sense, the "Auto-relock" feature will prevent "tailgating" by turning off the Main Relay output immediately when the door is closed after access has been granted. If the **SENSE** input is programmed for "inhibit", the input can be wired to a "service" switch or automatic timer that will disable the Main Relay when required.

The **REQUEST-TO-EXIT** input can be wired to a pushbutton to provide codeless activation of Main Relay, Auxiliary Relay, Output #3, or Output #4 (programmable).

The **ALARM SHUNT** output activates when access is granted. This output can be wired to shunt alarm contacts on the access door/gate to prevent triggering of an alarm when authorized access occurs.

The AK-21W is powered from a 12-24 Volt AC or DC source. Power can be obtained from the access device or a separate power supply. The EEPROM memory retains all entry codes and programming, even without power. An internal jumper is provided to reset the master code. The Main Relay has a 5 Amp capacity. The Auxiliary Relay has a 1 Amp capacity. Two solid state outputs, capable of switching 100 mA to common, are programmable to signal forced entry, door ajar, lockout, alarm circuit shunting, request-to-exit, and keypad active conditions.

FEATURES

✓ **WEATHER RESISTANT DESIGN**
    For outdoor installation

✓ **KEYPAD PROGRAMMABLE**
    No programmer required

✓ **480 ENTRY CODE CAPACITY**
    Ideal for small & medium traffic installations

✓ **1-6 DIGIT ENTRY CODE LENGTH**
    Flexible code length for different applications

✓ **4 INDEPENDENT OUTPUTS (TIMED/TOGGLED)**
    Each output's action is programmable

✓ **4 INDEPENDENT TIMERS**
    Each output's activation time is programmable

✓ **TWO FORM "C" (N.O. & N.C) RELAY CONTACTS**
    Main Relay 5-Amp @ 28 VDC capacity,
    Auxiliary Relay 1-Amp @ 28 VDC capacity

✓ **EACH ENTRY CODE CAN ACTIVATE EITHER OR BOTH RELAYS**
    Specific entry codes can grant access to different doors

✓ **TWO SOLID STATE OUTPUTS**
    Auxiliary outputs can indicate access status on external devices

✓ **TWO STATUS INDICATORS (2-COLOR RED/GREEN & YELLOW)**
    Displays access, lockout, and programming information

✓ **WHITE SOLID-STATE LED COURTESY LAMP**
    Programmable off/on/timed

✓ **PIEZO SOUNDER (TWO SELECTABLE VOLUME LEVELS)**
    Programmable for beeps during key presses and output activations

✓ **TIMED ANTI-PASSBACK**
    Disables entry code for a programmed time after use

✓ **AUTO-RELOCK**
    Releases the main relay as soon as the door shuts

✓ **KEYPAD LOCKOUT**
    Locks the keypad after too many incorrect entries

✓ **TACTILE KEY FEEL**
    Assures complete key presses

✓ **DOOR SENSE INPUT**
    For sensing door position to control auto-relock and door-ajar features

✓ **INHIBIT INPUT**
    For temporarily disabling access with a timer or switch

✓ **REQUEST-TO-EXIT INPUT**
    For codeless activation with a pushbutton

✓ **KEYPAD CAN BE POWERED FROM 12-24 VOLTS AC OR DC**
    Power can be supplied from a transformer, battery, or power supply

COMPONENT LOCATIONS

RED/GREEN POWER/ACCESS INDICATOR

YELLOW "LOCKOUT" INDICATOR

MASTER CODE RESET JUMPER (JP2)

BEZEL

TERMINAL BLOCK #2 (TB2)

SOLID STATE WHITE LED DOWN LIGHT

TERMINAL BLOCK #1 (TB1)

FACEPLATE

KEYPAD

MOUNTING PLATE

BEEPER LEVEL JUMPER (JP1)

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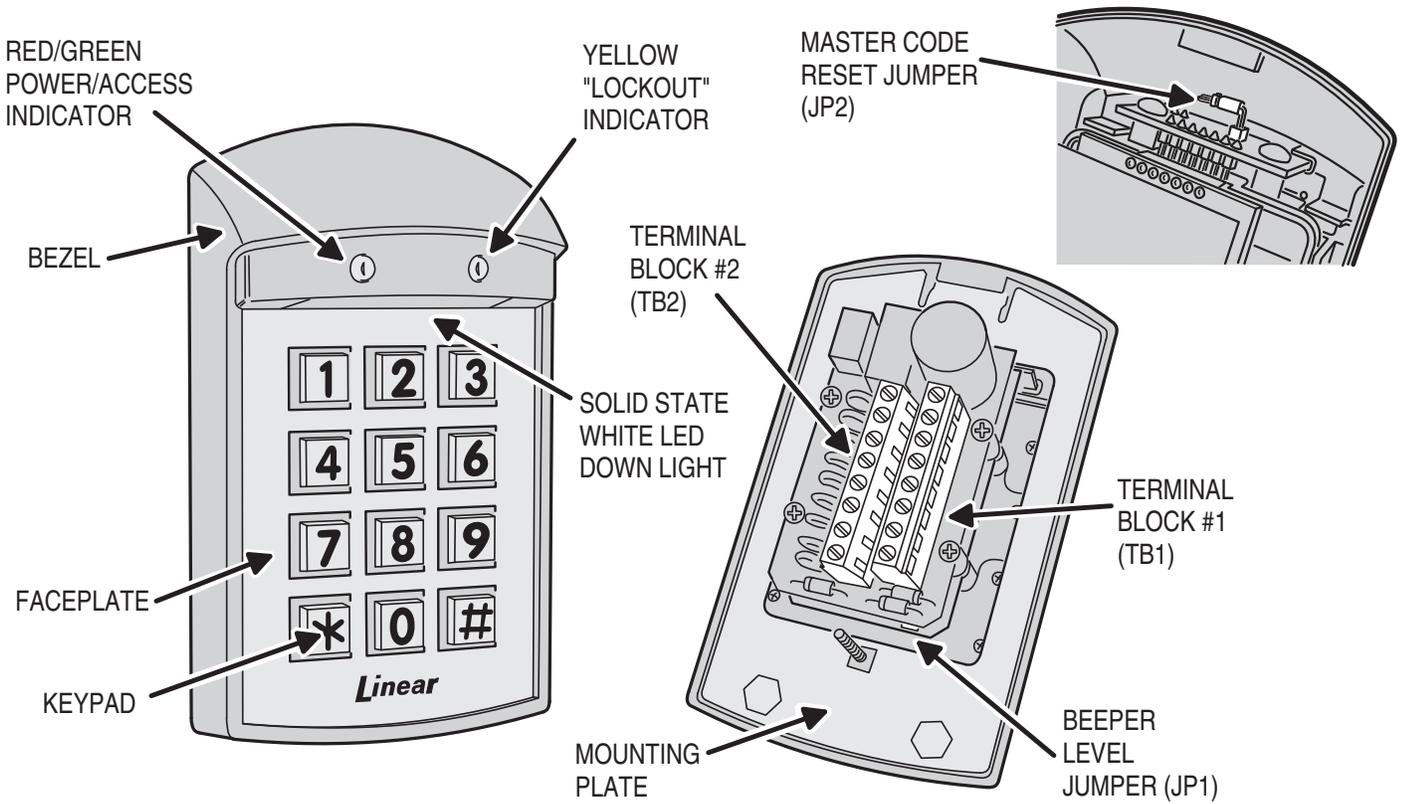
Figure 1. Component Locations

WIRING DIAGRAM

TYPICAL DOOR INSTALLATION WIRING

AK-21W TERMINALS

TERMINAL BLOCK 2

POWER SUPPLY

ELECTRIC DOOR STRIKE

1 - AC OR DC **+12-24 VOLT AC OR DC POWER**
2 - AC OR DC **–**
3 - N.O. **MAIN RELAY 5 AMPS @ 28 VDC MAX.**
4 - COM
5 - N.C.
6 - N.O. **AUXILIARY RELAY 1 AMP @ 28 VDC MAX.**
7 - COM
8 - N.C.

TERMINAL BLOCK 1

SENSE - 8
COM - 7
REQUEST-TO-EXIT - 6
EARTH GROUND - 5
OUTPUT #3 COM - 4
OUTPUT #3 - 3 } **AUXILIARY OUTPUTS 100 mA MAX. TO COMMON**
OUTPUT #4 - 2
OUTPUT #4 COM - 1

N.C. DOOR SWITCH

REQUEST TO EXIT BUTTON

GROUND STAKE

TO ALARM SYSTEM

ALARM CONTACT

REQUIRED WIRING

OPTIONAL WIRING

OTHER WIRING

NOTES:
1. ALARM SHUNT SET FOR AUXILIARY RELAY
2. TERMINAL BLOCK #2, TERMINAL 8 SET FOR DOOR SENSE

⚠ **CAUTION** ⚠

IF THE UNIT IS AC POWERED, MAKE SURE THE SECONDARY OF THE SYSTEM TRANSFORMER IS ISOLATED FROM EARTH GROUND

Figure 2. Wiring Diagram

1

INSTALLATION

Before installing the keypad, the unit must be partially disassembled to access the mounting plate.

Opening the Keypad

The keypad assembly is secured with two tamper-resistant screws. Refer to Figure 3 for disassembly details.

- ❏ Use the special allen wrench (supplied) to remove the two tamper-resistant screws.
- ❏ Separate the mounting plate from the keypad assembly.

① REMOVE THE TWO SCREWS

MOUNTING PLATE

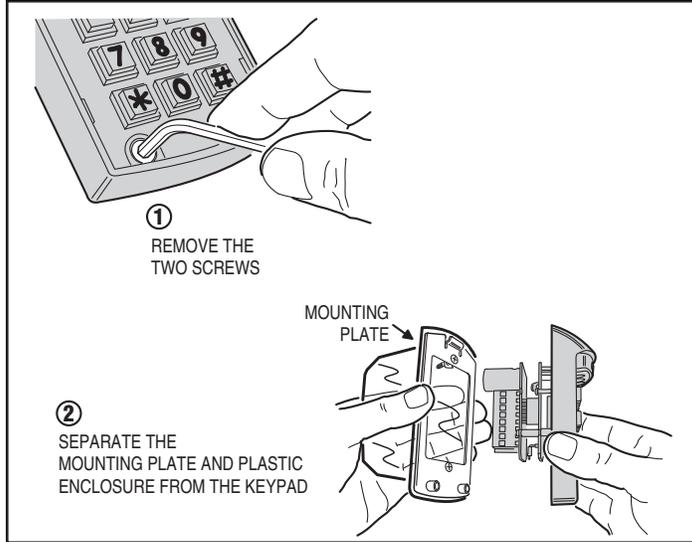**② SEPARATE THE MOUNTING PLATE AND PLASTIC ENCLOSURE FROM THE KEYPAD**

Figure 3. Opening the Keypad

Install the Electrical Box and Mounting Plate

The keypad is designed to fit into a single-gang electrical box. The box must be deep enough to accomodate the protective plastic enclosure. Select a location near the controlled door and choose a convenient height for the keypad. Be sure there is good wiring accessibility for the unit's power and the output to the door strike or access device.

- ❏ Install the electrical box in the wall.
- ❏ Place gasket on protective plastic enclosure and insert into electrical box.
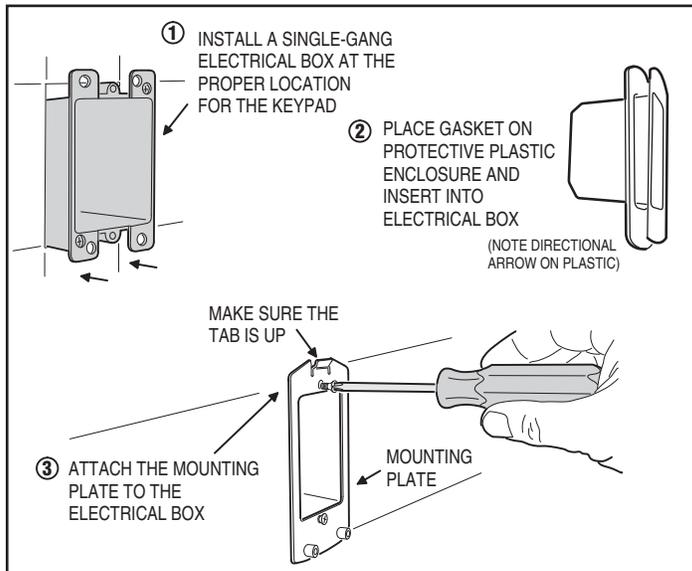- ❏ Screw the mounting plate onto the electrical box (see Figure 4).

① INSTALL A SINGLE-GANG ELECTRICAL BOX AT THE PROPER LOCATION FOR THE KEYPAD

② PLACE GASKET ON PROTECTIVE PLASTIC ENCLOSURE AND INSERT INTO ELECTRICAL BOX

(NOTE DIRECTIONAL ARROW ON PLASTIC)

MAKE SURE THE TAB IS UP

③ ATTACH THE MOUNTING PLATE TO THE ELECTRICAL BOX

MOUNTING PLATE

Figure 4. Installing the Mounting Plate

2

Final Keypad Installation

After wiring the keypad (see next page), complete the installation by securing the keypad to the mounting plate.

- ❏ If a lower beeper sound level is required, before installing the keypad, remove Jumper JP1 (place the jumper block on one pin to save the jumper).
- ❏ Hook the keypad assembly onto the mounting plate tab (see Figure 5).
- ❏ Use the special allen wrench (supplied) to install the two tamper-resistant screws.
- ❏ Fit the bottom tab on the faceplate into the slot on the keypad then snap the top of the faceplate in.

① HOOK THE KEYPAD ASSEMBLY ONTO THE MOUNTING PLATE

② INSTALL THE TWO SCREWS

③ FIT THE BOTTOM TAB OF THE FACEPLATE INTO THE SLOT ON THE KEYPAD

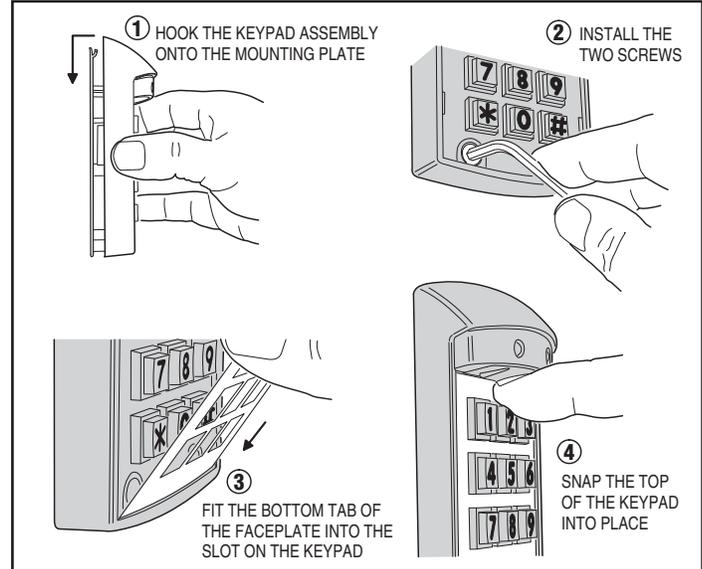**④ SNAP THE TOP OF THE KEYPAD INTO PLACE**

Figure 5. Connecting the Keypad to the Mounting Plate

Faceplate Removal

Refer to Figure 6 for details on removing the faceplate if keypad service is required.

① PRY UP ON THE FACEPLATE HERE
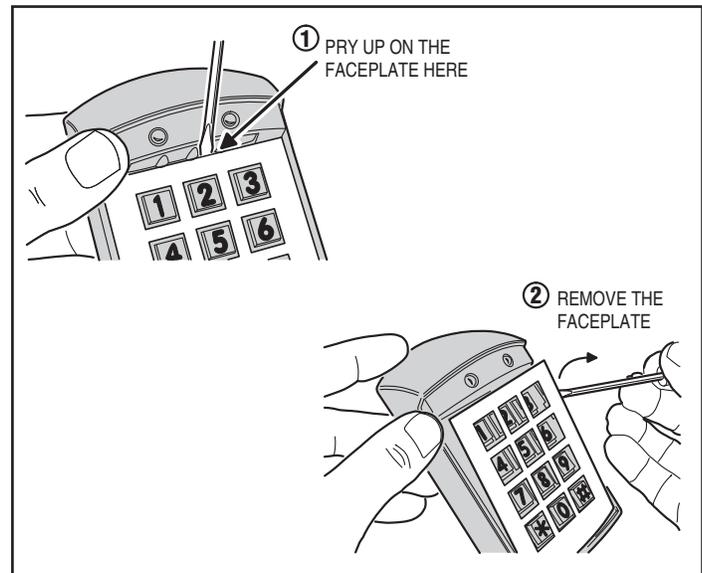
② REMOVE THE FACEPLATE

Figure 6. Removing the Faceplate

Keypad Wiring

See Figure 7 for an example of a basic door installation. The keypad is mounted adjacent to the door. An electric door strike is mounted in the door jamb to release the door lock. A magnetic switch is mounted on the top of the door jamb for detecting when the door is open.

Use the following steps to wire the keypad. Refer to the wiring diagram shown in Figure 8 to assist in the wiring.

☞ **NOTE:** *Up to 500 feet of 18 AWG wire can be run for power, use larger wire for longer runs. Use 22 AWG or larger (depending on the load) for other connections.*

OUTPUT
❑ Install a low voltage electric door strike for unlocking the door.
❑ Route two wires between the door strike and the keypad box. Connect one of the door strike wires to the keypad's **MAIN RELAY N.O.** terminal (TB2 #3). Connect the other door strike wire to the keypad's **AC/DC +** terminal (TB2 #1). Connect a wire between the keypad's **AC/DC -** terminal (TB2 #2) and the **MAIN RELAY COM** terminal (TB2 #4).

POWER
❑ Choose a location for the power supply or transformer.
❑ Route two wires between the power supply and the keypad box. Connect the power supply's output terminals to the keypad's **AC/DC** input terminals (TB2 #1 & #2). Observe wiring polarity if using DC.

✦ **CAUTION: If the unit is AC powered, make sure the secondary of the system transformer is isolated from earth ground.**

EARTH GROUND
❑ To avoid damage to the unit from static discharges, connect the **EARTH GROUND** terminal (TB1 #5) to a good earth grounding point. Suggested wiring size is 18 AWG for earth ground.

SENSE INPUT
☞ **NOTE:** *SENSE terminal (TB1 #8) can be programmed for either a door sense or inhibit input. Both features cannot be used at the same time.*
❑ To use the door sense feature to detect forced entry or door ajar conditions, install a *normally closed* door switch on the door and route two wires from the switch to the keypad box. Connect the door switch to the keypad's **SENSE** terminal (TB1 #8) and **COM** terminal (TB1 #7).
❑ If an inhibit switch or timer is going to be used for temporarily disabling the keypad, route two wires from the switch or timer to the keypad box. Connect the inhibit switch/timer *normally open* terminals to the keypad's **SENSE** (TB1 #8) and **COM** (TB1 #7) terminals.

REQUEST-TO-EXIT INPUT (wiring shown on Page 1, Figure 2)
❑ If a request-to-exit pushbutton is going to be used, route two wires from the keypad box to a normally open pushbutton mounted on the secure side of the door. Connect the wires to the pushbutton and to the keypad's **EXIT** (TB1 #6) and **COM** (TB1 #7) terminals.

Solid State Outputs

The two solid state outputs (Output #3 & Output #4) can be programmed to activate during various conditions. These outputs can be used to activate indicators or sounders. See Figure 9 for wiring examples using the solid state outputs.
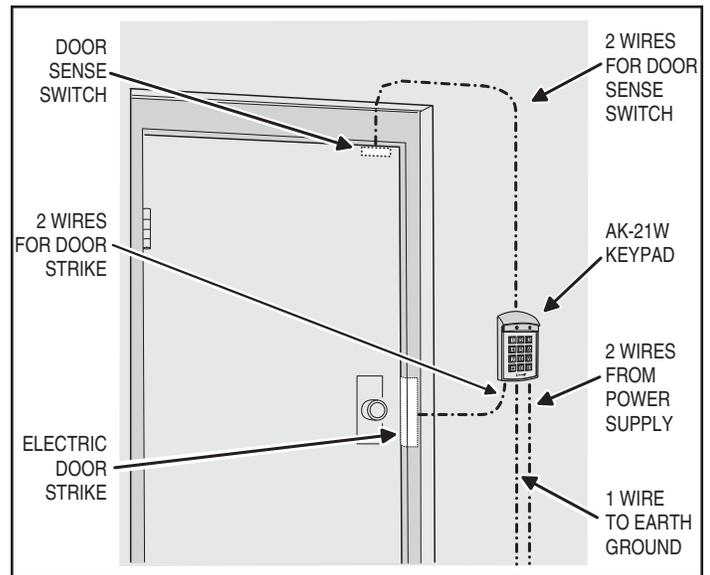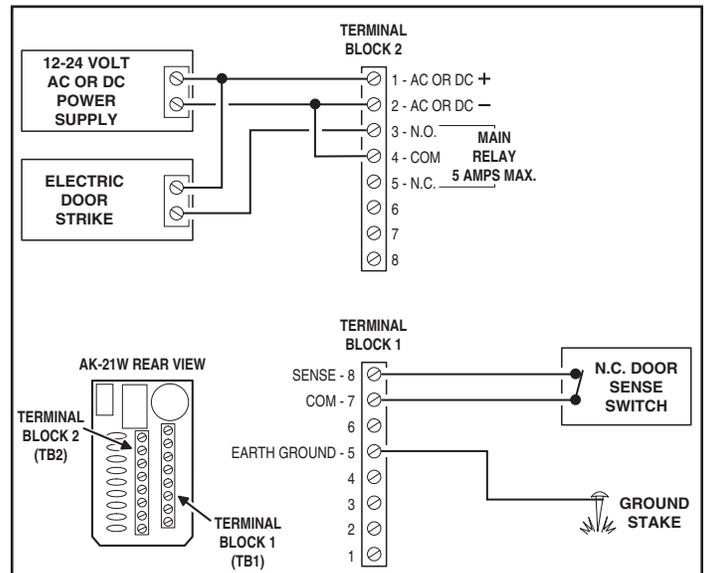

Figure 7. Basic Door Installation
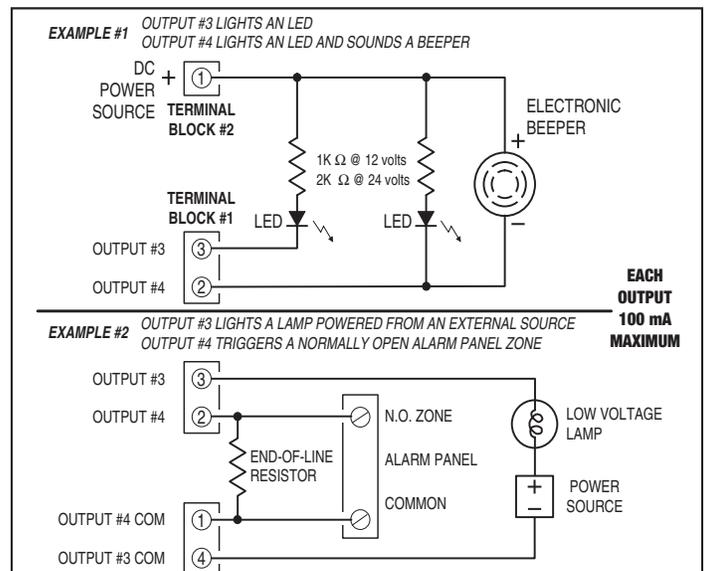

Figure 8. Basic Door Installation Wiring

Figure 9. Using Solid State Outputs

3

FACTORY DEFAULTS

MASTER PROGRAMMING CODE 123456
ENTRY CODE LENGTH . . . . 4 DIGITS
REQUEST-TO-EXIT OUTPUT RELAY . . . . MAIN RELAY
ALARM SHUNT OUTPUT . . . . DISABLED
FORCED ENTRY OUTPUT . . . . OUTPUT #3
DOOR AJAR OUTPUT . . . . OUTPUT #4
MAIN RELAY ON TIME . . . . 2 SECONDS
AUXILIARY RELAY ON TIME . . . . 2 SECONDS
SOLID STATE OUTPUT #3 ON TIME . . . . 2 SECONDS
SOLID STATE OUTPUT #4 ON TIME . . . . 2 SECONDS
DOWNLIGHT ON TIME . . . . 2 MINUTES
DOOR SENSE/INHIBIT INPUT . . . . DOOR SENSE
KEYPAD LOCKOUT OUTPUT . . . . DISABLED
KEYPAD ACTIVE OUTPUT . . . . DISABLED
BEEPER SOUNDS WHEN KEY PRESSED . . . . YES
BEEPER SOUNDS DURING RELAY #1 . . . . NO
BEEPER SOUNDS DURING RELAY #2 . . . . NO
BEEPER SOUNDS DURING OUTPUT #3 . . . . NO
BEEPER SOUNDS DURING OUTPUT #4 . . . . NO
KEYPAD LOCKOUT COUNT . . . . 3 TRIES BEFORE LOCKOUT
ANTI-PASSBACK TIME . . . . NO ANTI-PASSBACK
AUTO-RELOCK . . . . ON

BASIC PROGRAMMING

When the AK-21W is in Programming Mode, both indicators will turn off until programming begins. After a programming option number is entered the yellow indicator will blink. This shows that the AK-21W is ready to accept the new programming data. After the new data entry is complete, the yellow indicator will flash while the data is being stored. The green indicator will light if the data is accepted. The red indicator will light if any programming data is entered incorrectly, and the command will have to be fully re-entered.

Entering Programming Mode

The 6-digit Master Programming Code (default = 123456) is used to enter Programming Mode.

Press: **# 9 # *Master Code***

Master Code = the current 6-digit Master Programming Code

Exiting Programming Mode

Press: **✱ ✱ #**

The red indicator will light after exiting Programming Mode.

☞ **NOTE:** *The AK-21W will automatically exit Programming Mode after two minutes of inactivity.*

Re-entering a Command After a Mistake

If the red indicator lights, signaling an incorrect entry, or an incorrect key is pressed during programming, to clear the keypad and re-enter the command:

Press: **✱ 9 #**

Setting Entry Code Length   Default: 4 digits

Press: **O 3 # *Length* #**

Length = 1 - 6 for entry code length

☞ **NOTE: If the Entry Code Length is going to be changed from the factory default of four digits, make this change first, before programming any entry codes.**

Adding a New Entry Code

Press: **01 # Code # Code # Action #**

Code = The new entry code: 1-999999, depending on code length

   Action = Relay output entry code will activate as follows:
   1 = Relay #1, timed open
   2 = Relay #2, timed open
   3 = Both Relays, timed open
   10 = Relay #1, toggled
   20 = Relay #2, toggled
   30 = Both Relays, toggled
   12 = Relay #1 toggled; Relay #2, timed open
   21 = Relay #1 timed open; Relay #2 toggled

The yellow LED will flash quickly while the AK-21W searches its memory for available space and duplicate entries. The green LED will light when the new code is stored.

If the new entry code chosen is already being used for another entry code, the red LED will light. A new *unique* code needs to be entered.

☞ **NOTE:** *Leading zeros (zeros before the code number, i.e. 0001) do not need to be entered when programming a new entry code. The AK-21W will internally add any zeros to fill all digits determined by the entry code length setting. Leading zeros **will** have to be entered by the user when entering their code to gain access.*

Erasing a Single Entry Code

Press: **O 2 # *Code* # *Code* #**

Code *= The entry code to delete.*

The yellow indicator will flash quickly while the AK-21W searches its memory for the code to erase. The green indicator will light when the code is erased.

Erasing All Entry Codes

★ **WARNING: PERFORMING THIS COMMAND WILL REMOVE *ALL* ENTRY CODES FROM THE MEMORY.**

Press: **9 7 # 0 0 0 0 0 0 # 0 0 0 0 0 0 #**

☞ **NOTE:** *The green indicator will light while the memory is being erased. This may take up to 15 seconds.*

Changing the 6-Digit Master Programming Code

Press: **9 8 # *Master Code* # *Master Code* #**

Master Code *= The new 6-digit Master Programming Code*

   New master code: _____

PROGRAMMING OPTIONS

There are several AK-21W programming options. For most installations, the factory set default options are sufficient. The keypad must be in Programming Mode to make these changes.

Select Door Sense or Inhibit Input   **Default: Door Sense**

The input on Terminal Block TB1, Terminal #8 can be programmed for **DOOR SENSE** or **INHIBIT**.

Press: **1 0 #** *Input* **#**

Input = 0 for Door Sense, = 1 for Inhibit

When programmed for **DOOR SENSE**, if an open condition on the input occurs before access is granted (with an entry code or with the request-to-enter input) a **FORCED ENTRY** output will occur. If an open condition remains 60 seconds after a relay activation for access, a **DOOR AJAR** output will occur.

When programmed for **INHIBIT**, a closed condition on the input will prevent Relay #1 from activating when access is requested with an entry code. This mode is typically used with an external timer to disable the access device at certain times.

Select Forced Entry Output   **Default: Output #3**

Sets which output activates if the **DOOR SENSE** input opens before access is granted. This output is not timed.

Press: **1 1 #** *Output* **#**

Output = Output to Activate (0-4)

1 = Main Relay 2 = Auxiliary Relay 3 = Output #3 4 = Output #4 0 = No Output

---

Select Door Ajar Output   **Default: Output #4**

Sets which output activates if the **DOOR SENSE** input stays open 60 seconds after access is granted. This output is not timed.

Press: **1 2 #** *Output* **#**

Output = Output to Activate (0-4)

1 = Main Relay, 2 = Auxiliary Relay, 3 = Output #3, 4 = Output #4, 0 = No Output

---

Select Keypad Lockout Output   **Default: No Output**

Sets which output activates when the keypad is "locked out" after too many incorrect entry code attempts. The lockout time is 60 seconds.

Press: **1 3 #** *Output* **#**

Output = Output to Activate (0-4)

1 = Main Relay, 2 = Auxiliary Relay, 3 = Output #3, 4 = Output #4, 0 = No Output

---

Select Keypad Active Output   **Default: No Output**

Sets which output activates when any keys are pressed. This output is timed. If toggle mode is selected for the output, the timer value defaults to 2 seconds.

Press: **1 4 #** *Output* **#**

Output = Output to Activate (0-4)

1 = Main Relay, 2 = Auxiliary Relay, 3 = Output #3, 4 = Output #4, 0 = No Output

---

Select Alarm Shunt Output   **Default: No Output**

Sets which output activates during the time access is granted. (Use this output to shunt alarm contacts attached to the access door.) This output may be timed or toggled.

Press: **1 5 #** *Output* **#**

Output = Output to Activate (0-4)

1 = Main Relay, 2 = Auxiliary Relay, 3 = Output #3, 4 = Output #4, 0 = No Output

---

Select Request-to-Exit Output   **Default: Main Relay**

Sets which output activates when the Request-to-Exit input is grounded. This output may be timed or toggled.

Press: **1 6 #** *Output* **#**

Output = Output to Activate (0-4)

1 = Main Relay, 2 = Auxiliary Relay, 3 = Output #3, 4 = Output #4, 0 = No Output

---

Main Relay On-time   **Default: 2 Seconds**

Sets the length of time the Main Relay activates when triggered.

Press: **2 1 #** *Seconds* **#**

Seconds = Output time in seconds (0-60)

Auxiliary Relay On-time   **Default: 2 Seconds**

Sets the length of time Auxiliary Relay activates when triggered.

Press: **2 2 #** *Seconds* **#**

Seconds = Output time in seconds (0-60)

Solid-state Output #3 On-time   **Default: 2 Seconds**

Sets the length of time Output #3 activates when triggered.

Press: **2 3 #** *Seconds* **#**

Seconds = Output time in seconds (0-60), 99 = Toggle Mode

Solid-state Output #4 On-time   **Default: 2 Seconds**

Sets the length of time Output #4 activates when triggered.

Press: **2 4 #** *Seconds* **#**

Seconds = Output time in seconds (0-60), 99 = Toggle Mode

Set Downlight On-Time   **Default: 2 Minutes**

Sets the time duration that the downlight remains on after a key press.

Press: 2 5 # Duration #

0 = Always off, 1 = 1 minute, 2 = 2 minutes, 3 = 3 minutes, 4 = 4 minutes, 99 = Always on

---

Beep Sounds on Keystrokes   **Default: Yes**

Selects whether or not the keypad beeps as each key is pressed.

Press: **4 0 #** *Sound* **#**

Sound = 1 for Yes, = 0 for No

Beep Sounds During Main Relay   **Default: No**

Selects whether or not the keypad beeps during Main Relay activation.

Press: **4 1 #** *Sound* **#**

Sound = 1 for Yes, = 0 for No

Beep Sounds During Auxiliary Relay   **Default: No**

Selects whether or not the keypad beeps during Auxiliary Relay activation.

Press: **4 2 #** *Sound* **#**

Sound = *1 for Yes, = 0 for No*

Beep Sounds During Output #3   **Default: No**

Selects whether or not the keypad beeps during Output #3 activation.

Press: **4 3 #** *Sound* **#**

Sound = *1 for Yes, = 0 for No*

Beep Sounds During Output #4   **Default: No**

Selects whether or not the keypad beeps during Output #4 activation.

Press: **4 4 #** *Sound* **#**

Sound = *1 for Yes, = 0 for No*

Keypad Lockout Count   **Default: 3 Tries**

Sets the number of incorrect entry code attempts allowed before the keypad "locks out".

Press: **5 0 #** *Attempts* **#**

Attempts = *Number of attempts before lockout (2-7)*

Anti-passback Time   **Default: No Anti-passback**

Sets the length of time an entry code will not function after it is used.

Press: **5 1 #** *Minutes* **#**

Minutes = *Time in Minutes (1-4), 0 = No Anti-passback*

RESETTING KEYPAD

Master Reset

✦ **CAUTION: Performing a master reset will clear the entire memory of the AK-21W and return all programmable options to the factory default values. ALL ENTRY CODES WILL BE ERASED.**

STEP 1 Disconnect power from the keypad.
STEP 2 Press and hold down the ✳ and # keys.
STEP 3 Apply power to the keypad, continue holding the keys down until the red indicator starts flashing.
STEP 4 Release the keys. The red and yellow indicators will remain lit until the process is complete, then the yellow indicator will go out.

Resetting the Master Code

STEP 1 Open the AK-21W case.
STEP 2 Locate jumper JP2. This jumper is used to reset the master code.
STEP 3 With power applied to the keypad, remove jumper JP2. The keypad will begin to beep, signaling that the code has been reset.
STEP 4 Replace jumper JP2.
THE MASTER PROGRAMMING CODE IS NOW 123456.

AK-21W OPERATION

Keypad users request access by entering their code.

❑ Users of the AK-21W have up to 40 seconds to key in their entry code.
❑ Up to eight seconds are allowed between each keystroke.
❑ All digits of the entry code must be entered. Example: If the code is 0042, the user must enter "0 0 4 2".
❑ If the wrong key is pressed, pressing the ✳ key will reset the keypad. The correct code can then be re-entered.
❑ After a correct code is entered, the red indicator will turn green and the programmed relay will activate for the programmed time.
❑ If the number of incorrect codes entered exceeds the keypad lockout count, the yellow indicator will light, indicating that the keypad is locked out. The lockout will remain for one minute.
❑ After a valid code has been entered, it will be unusable until the anti-passback time expires.

SPECIFICATIONS

MECHANICAL
  Dimensions: 3.00" W x 5.00" H x 3.00" D

ELECTRICAL
  Voltage: 12-24 Volts AC or DC
  Current: 30 mA typical, 150 mA maximum
  Outputs: Main Relay:
      Form "C" 5 Amps @ 28 Volts maximum
    Auxiliary Relay:
      Form "C" 1 Amp @ 28 Volts maximum
    Solid state outputs (Outputs #3 & #4):
      Short-to-common 100 mA @ 24 VDC maximum

ENVIRONMENTAL
  Temperature: -22°F to 149°F (-30°C to 65°C)
  Humidity: 5% to 95% non-condensing

LINEAR LIMITED WARRANTY

This Linear product is warranted against defects in material and workmanship for twenty-four (24) months. The Warranty Expiration Date is labeled on the product. This warranty extends only to wholesale customers who buy direct from Linear or through Linear's normal distribution channels. Linear does not warrant this product to consumers. Consumers should inquire from their selling dealer as to the nature of the dealer's warranty, if any. **There are no obligations or liabilities on the part of Linear LLC for consequential damages arising out of or in connection with use or performance of this product or other indirect damages with respect to loss of property, revenue, or profit, or cost of removal, installation, or reinstallation.** All implied warranties, including implied warranties for merchantability and implied warranties for fitness, are valid only until Warranty Expiration Date as labeled on the product. **This Linear LLC Warranty is in lieu of all other warranties express or implied.**

All products returned for warranty service require a Return Product Authorization Number (RPA#). Contact Linear Technical Services at 1-800-421-1587 for an RPA# and other important details.

FCC NOTICE

Changes or modifications not expressly described in this manual or approved by the manufacturer could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help.