

# **INSTALLATION INSTRUCTIONS FOR THE MINI-KEY SYSTEM**

**Sentexsystems**



# IMPORTANT NOTICES

The Mini-Key system is a very reliable and easy to use system. However, damage could occur if it is installed incorrectly. In particular, ***it is critical that the Mini-Key system is grounded properly.*** The Mini-Key system contains static sensitive components that can be damaged if the system is subjected to static discharge and is not properly grounded. Incorrect installation also invalidates the system's warranty. Therefore, we ask that you take the time to read these instructions very carefully before attempting to install this system.

There are four (4) sections to this document. These sections are as follows:

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# **1 - BASIC INSTALLATION HINTS AND RULES**

PLEASE READ THIS SECTION CAREFULLY BEFORE BEGINNING YOUR INSTALLATION

In the sections that follow, detailed procedures are discussed for each step in installing the Mini-Key system. In addition to these specific procedures, there are a number of general hints and rules which will help ensure that your installation is done correctly and efficiently. These are discussed below:

1. **GROUND THE SYSTEM AND YOURSELF THOROUGHLY.** The Mini-Key system contains a number of static sensitive components which can be damaged by static discharge during installation or during regular use. This type of damage is not covered under Sentex's warranty. A proper earth ground connected to the system's chassis (at the grounding screw shown in Appendix 1) will greatly reduce the chances of damage or improper operation.

To be effective, the ground connection should be made by running 12 awg copper wire to a good ground point within 12 feet of the system. This ground point must be at an electrical panel, at a metallic cold-water pipe that runs into the earth, or at a grounding rod at least 10 feet in length that is driven into the earth. If you cannot meet these requirements, a ground will be of little value. Nonetheless, you should try to discharge any static before handling the circuit boards.

2. **PROVIDE POWER FROM A DEDICATED SOURCE.** If you are powering the system from an AC source, be sure that it is solely dedicated to the Minikey system. Specifically, the outlet in which you will plug the transformer provided should be wired back to its own circuit breaker. This will prevent two problems: **A)** other equipment cannot introduce spikes, noise, surges, or dips into the power circuit that will affect the Mini-Key system, and **B)** the Mini-Key's operation will not be affected if any other equipment develops a short circuit across the power line.
3. **DO NOT OVERLOAD THE TERMINAL BLOCKS.** The terminal blocks used in the Mini-Key system make field wiring simple, but they do have their limits. The terminal blocks are unpluggable and the pins are soldered into the boards. To connect your wires, remove the "head" from the correct terminal and open the screws. Insert the wire into the correct opening in the front and tighten the screw until the wire is held snugly. A slight tug on the wire will tell you whether or not you have a secure connection. When you have made all connections for a given "head", plug it back onto the pins designated for that terminal block.
4. **READ THE MARKINGS CAREFULLY.** The connection points are marked on the boards clearly. Before making any connection, make sure you read the markings and understand what that connection point is made for.

## **2 - MOUNTING THE CABINET**

1. Remove the four (4) screws from the front panel of the Mini-Key system with the hex tool provided with the system. Carefully remove the keypad and the boards from the cabinet and set aside onto a static-free surface. **Try to discharge any static that you may have built up before handling the board.**
2. Determine which of the two openings into the cabinet (back or bottom) will be used to run wires into the cabinet. If the wires can be pulled through the wall or pedestal on which the unit is to be mounted, you should use the back opening into the box since it provides better protection against tampering/ vandalism. If this cannot be accomplished, run the wires through 3/4 inch conduit into the bottom opening of the cabinet. Be sure to connect the conduit to the unit securely.
2. Carefully remove the knockout plug from the opening to be used.
3. Mount the unit on the wall or pedestal securely. Mounting hardware is provided if you are using Sentex's pedestal mount post. Do not put the keypad and the circuit board back into the cabinet until all connections are made as described in the following sections.

### **3 - MAKING ALL CONNECTIONS**

1. **System Power:** Take a 2 conductor cable (for wire size, see Table 1 below) and connect one end of the cable to the 12VAC, 20 VA transformer supplied by Sentex (or 13.5 VDC power supply that you provide). Next, take the opposite end of the cable and attach it to the connector located in area TB4 of the circuit board. **Do not connect the power to the system until all connections have been made to the system.**

**PLEASE NOTE:** If you are using a DC power supply, the Mini-Key system will not trickle charge a battery, so the DC power must be supplied by an uninterruptible power supply (UPS).

<b>DC POWER WIRE SIZE</b>	<b>DISTANCE</b>	<b>AC POWER WIRE SIZE</b>
18 AWG	30' and under	18 AWG
18 AWG	30'-75'	18 AWG
18 AWG	75'-150'	14 AWG
16 AWG	150'-250'	12 AWG
12 AWG	250'-500'	10 AWG

**Table 1 - Power Wire Distance**

2. **Door/Gate Control:** Connect the 2 conductor cable from your door strike and door strike power supply or from your gate operator to the relay contacts in area TB1 as follows:
  - a. **For normally locked strikes:** For relay 1, connect one conductor from your strike power to the "NO1" terminal and one conductor from the door strike to the "COM1" terminal. For relay 2, connect one conductor from your strike power to the "NO2" terminal and one conductor from the door strike to the "COM2" terminal. Then connect the remaining conductors from the source and the strike by tying them together (for example, using a wire nut).
  - b. **For magnetic strikes or normally open strikes:** For relay 1, connect one conductor from your strike power to the "NC1" terminal and one conductor from the door strike to the "COM1" terminal. For relay 2, connect one conductor from your strike power to the "NC2" terminal and one conductor from the door strike to the "COM2" terminal. Then connect the remaining conductors from the strike power and the strike by tying them together (for example, using a wire nut).

**WARNING:** In order to prevent voltage spikes generated by magnetic lock or DC powered strikes from being induced into the system, it is strongly recommended that a IN4001 diode be installed across the magnetic lock coil, so that the cathode of the diode (the end with the band) is connected to the positive connection of the coil and the anode is connected to the negative connection of the coil.

- c. **For dry contact closure (most gate operators):** For relay 1, connect one conductor to the "NO1" terminal and the other to the "COM1" terminal. For relay 2, connect one conductor to the "NO2" terminal and the other to the "COM2" terminal.

## **4 - INSTALLING ADDITIONAL FEATURES**

1. **Aux open/request for access:** Any device (e.g., exit button or Knox box) that provides a contact closure can be hooked up to "EXIT1" and "COM" in area TB3 to activate relay 1, or "EXIT2" and "COM" in the same area to activate relay 2. Shielded cable should be used and the shield should be connected to the lower left chassis ground screw shown in Appendix 1. When a contact closure occurs, the system will activate the appropriate relay for the programmed period of time.
2. **Time clock:** You may install a timer or clock to the Mini-Key system to be used in conjunction with the time clock feature. This timer or clock must provide a floating contact closure (a floating contact closure is a contact closure that is not grounded). To install a timer or clock, attach one wire to the plug in area TB3 marked "TZONE" and the other wire to the plug in the same area marked "COM".

**WARNING:** Any clock or timer that is connected to the Mini-key system must provide a floating contact closure. If the clock or time does not provide a floating contact closure, there is a very strong chance that the clock will "burn-out" the circuit board, and may start a fire. Any use of these devices will also void any Sentex warranty. If your clock or timer plugs directly into an AC power source and it has an AC output terminal, it does not provide a floating contact closure and should not be used with the Mini-Key system.

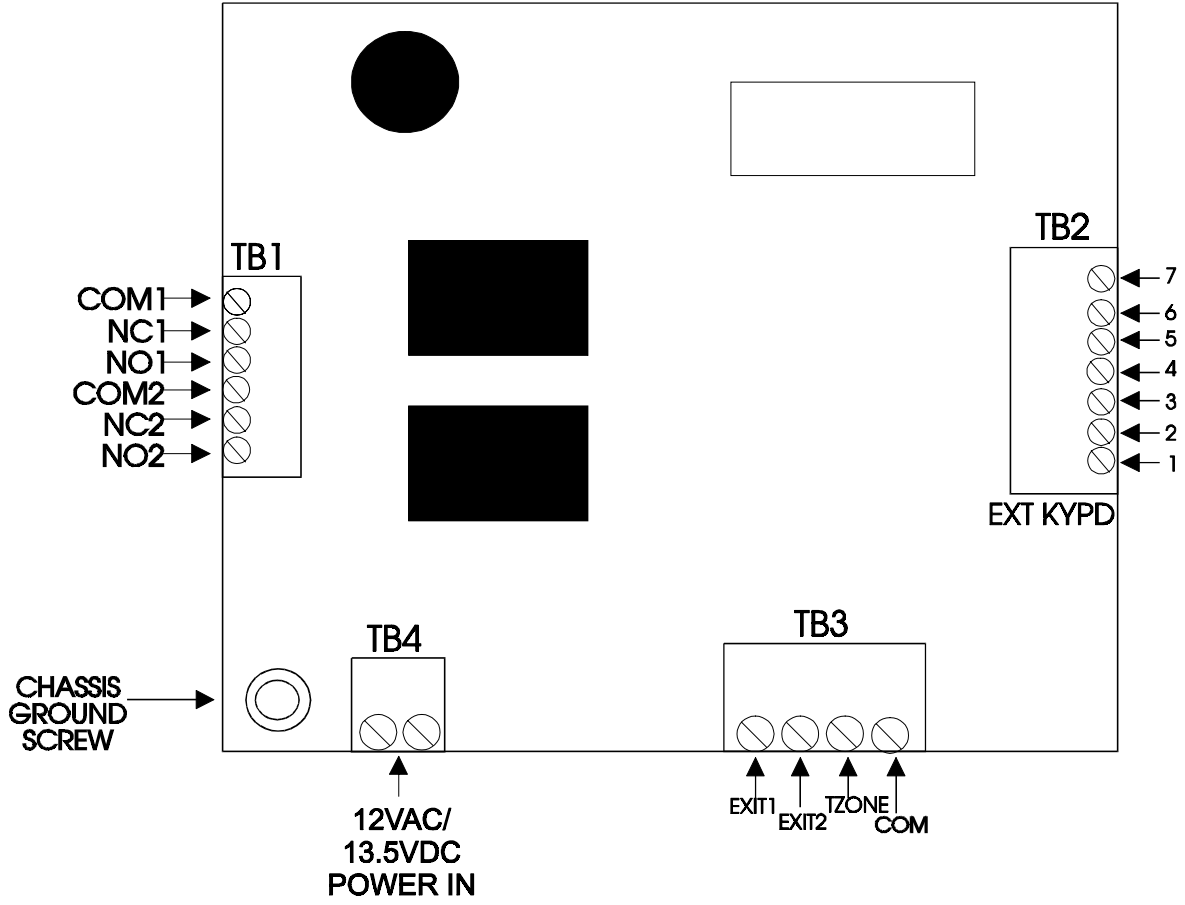
3. **Remote Keypad:** You may install a remote keypad to work with the Mini-Key. All information that is programmed into the Mini-Key will be the same information that is read by the remote keypad (refer to the manual titled "PROGRAMMING AND USE INSTRUCTIONS FOR THE MINI-KEY SYSTEM" for more information). The remote keypad should be located within 500 feet of the Mini-Key system. For this connection, you will need a 7 conductor, 20 to 24 awg shielded cable. We suggest using Belden Datalene #9932 (which has both a foil and a braided shield) or equivalent.

To install the remote keypad, attach one end of the wires to the pins located in area TB2 of the Mini-Key system. Next, take the opposite end of these wires and connect them to the pins in area TB2 of the remote keypad in the same order as the connection to the Mini-Key (for example, the wire which is attached to pin 1 on the Mini-Key should be attached to pin 1 on the remote keypad). Connect the shield to the ground screw on the Mini-Key (see Appendix 1).

**PLEASE NOTE:** The cables described above must be run in conduit. Where feasible, we strongly recommend using metal conduit (rather than PVC) and grounding the conduit as described in Point 1 on page 2 of this document. Do not run any wires other than the lamp power in this conduit.

If you have a lighted remote keypad, you will need to run the power for the lights from the Mini-Key system. For this connection, you will need a 2 conductor 18 awg wire. Take one end of the wires and connect them in parallel to the wires in area TB4 of the Mini-Key system. Then take the opposite end of these wires and insert them to the connector located in area TB1 of the remote keypad. **Do not connect the power to the Mini-Key system until all connections have been made.**

# MAIN PROCESSOR BOARD



# **FCC REQUIREMENTS**

## **RADIO FREQUENCY**

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 when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, 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.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the FCC helpful: "How to Identify and Resolve Radio-Television Interface Problems". This booklet is available from the United States Government Printing Office, Washington, D.C., 20402. Stock No. 004-000-00345-4.