KP2000E/EM Series Style Keypad

SCHLAGE

Installation and Programming Instructions
Models KP2000EXX and KP2000EMXX

Specifications

Parameter	Specifications	
Voltage Requirements	10-30 VDC; 12-24VAC	
Keypad Current Requirements (Max)	VDC	VAC
	10V: 85mA	12V: 150mA
	30V: 115mA	24V: 200mA
Relay Contact Rating	2A @ 30VDC (Main & Aux)	
REX Input	Normally Open Dry Contact	
Door Position Switch Input	Normally Closed Dry Contact	
Mechanical Dimensions	4.50" H x 2.75" W x 0.60" D	
Environment	Indoor or Outdoor	
Temperature Tolerance	-31°F to 151°F (-35ºC to 66°C)	
Front End Cable Type	Stranded and Shielded	
Front End Distance and Wire Gauge	1000 Ft. – 18AWG; 500 Ft – 20 AWG; 250 Ft. – 22 AWG	
Firmware Version	1.0x ("1" is the major version; "0" is the minor version; "x" is a minor version, reserved for bug fixes, which is indicated with a letter, such as "a".)	

Keypad Operating Modes

The KP2000E/EM Series keypad has two operating modes: Standalone Mode and Wiegand Front End Mode. Below is a brief explanation of each mode. Refer to the programming section for details about selecting each mode.
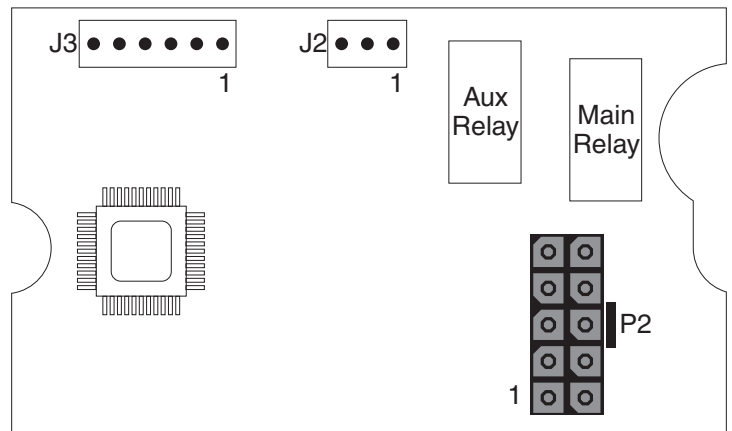
Standalone Mode:
By default, the keypad is programmed for Standalone Mode. In this mode, all the users and other programming options are maintained within the keypad and no additional controller is required. The lock and all other inputs and outputs are connected directly to the keypad.
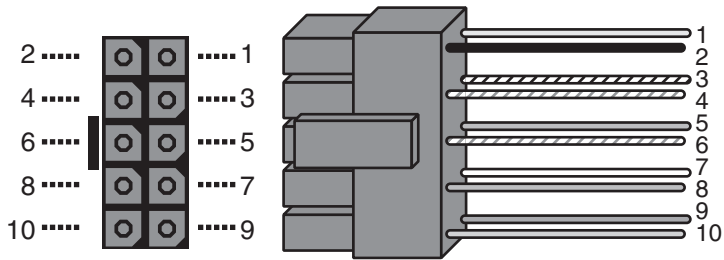
Wiegand Front End Mode:
In Wiegand Front End mode, a separate UL Listed compatible Wiegand Access Control panel is required. When you enter a code on the keypad it is then sent to the control panel as Wiegand card data, depending on which format you've programmed it for. The control panel maintains the users and programming options and makes all the access control decisions. The locking device and all inputs and outputs are connected to the control panel.

Mounting the Keypad

The keypad is designed to be flush mounted using a standard UL Listed single-gang electrical box. Mounting height can vary depending on requirements. An appropriate range is typically between 48 and 52 inches on center off the floor.

For outdoor installations, use a UL Listed weatherproof back box and seal the wire entry locations with silicone and provide a drain hole. For additional protection, install the provided foam gasket between the keypad and the back box. In addition, use the anti-oxidant grease pack for the wire harness connectors.

48 - 52"

Circuit Board Diagram

Note: J3 is NOT USED

Main Wire Harness (P2)

Pin	Wire Color	Description
1	Red	V+ (Keypad Power)
2	Black	V- (Keypad Power)
3	White/Black	Wiegand Data 0/Secured Series Data
4	White/Yellow	Wiegand Data 1/Secured Series Data
5	Brown	Request to Exit (REX)/LED1
6	White/Orange	Loop Common
7	White	Door Position Switch Input
8	Green	Main Relay Normally Open
9	Blue	Main Relay Common
10	Gray	Main Relay Normally Closed

Auxiliary Relay Wire Harness (J2)

Pin	Wire Color	Description
1	Green	Aux Relay Normally Open
2	Blue	Aux Relay Common
3	Gray	Aux Relay Normally Closed

UL Requirements

The KP2000E/EM Series keypad is a UL Listed access control unit. This section contains information regarding the requirements necessary to meet UL compliance.

Wiring methods shall be in accordance with the National Electrical Code (ANSI/NFPA70), local codes, and the authorities having jurisdiction.

All wires and cables used must be a minimum of 22 AWG, stranded and shielded UL Listed and/or recognized wire suitable for the application. In addition, input and output cables that extend from the unit must be shielded, twisted pair. Ground the shield only at one end, usually the circuit end.

All interconnecting devices (ie. door contacts, REX, locking devices, alarm devices, doorbell, etc.) must be UL Listed.

A UL Listed access control power limited power supply, capable of 4 hours standby, must be used to power the keypad.

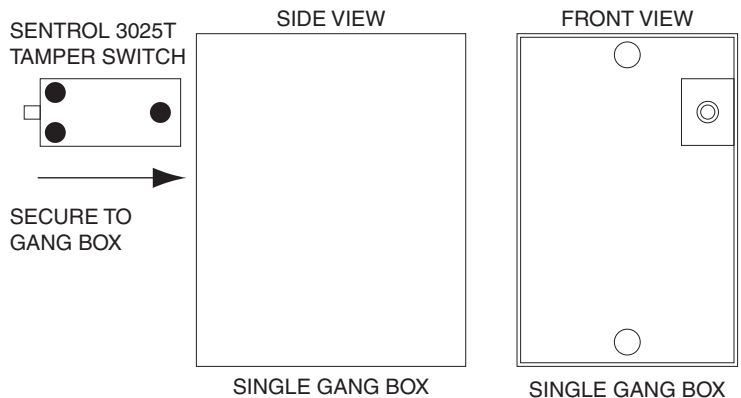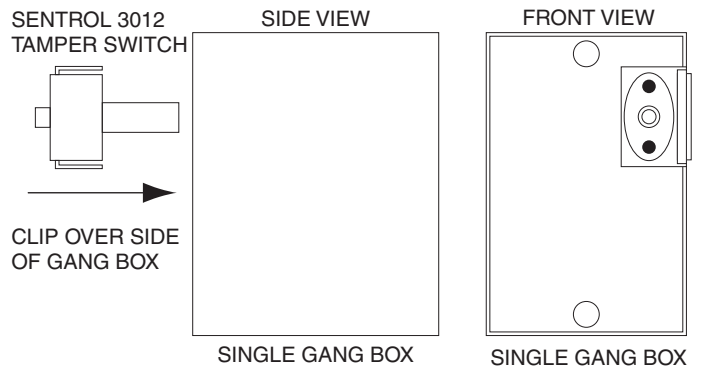A minimum of three user codes must be programmed for controlling access.

The following Wiegand card formats were not evaluated by UL: 28-bit, 29-bit, 30-bit, 31-bit, 32-bit or 36-bit (formats 2-8 from Wiegand format chart. UL did evaluate the 26-bit card format (format 1).

8-Bit Burst Mode was not evaluated by UL.
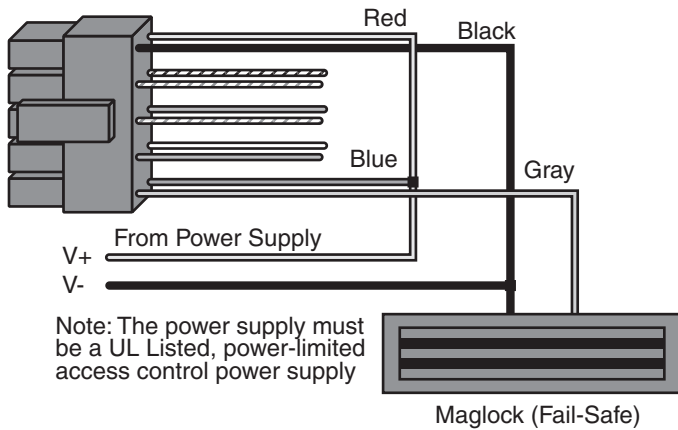
Installing a Tamper Switch

To meet UL requirements, a UL Listed tamper switch must be installed in a UL Listed single-gang box used for mounting the keypad. The tamper switch must activate if the keypad is removed from the box and must disconnect power from the lock. The lock must be a fail-secure device, meaning the lock remains locked when power is removed.

In addition, once the tamper device is activated, it must be configured so that it can only be reset from within the protected area. Only a Sentrol 3012 or Sentrol 3025T tamper switch can be used. The diagrams below show the suggested mounting location for each device.

SENTROL 3012 TAMPER SWITCH

SIDE VIEW

FRONT VIEW

CLIP OVER SIDE OF GANG BOX

SINGLE GANG BOX

SINGLE GANG BOX

SENTROL 3025T TAMPER SWITCH

SIDE VIEW

FRONT VIEW

SECURE TO GANG BOX
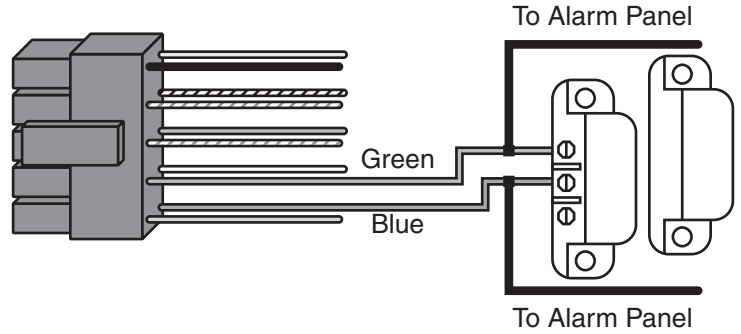
SINGLE GANG BOX

SINGLE GANG BOX

Wiring a Maglock (Fail-Safe)

1. Connect the red wire (V+) to the blue wire (common), and then connect them to the positive on the power supply.
2. Connect the gray wire (normally closed) to the positive on the Maglock.
3. Connect the black wire (V-) to the negative on the Maglock, and then connect them both to the negative on the power supply.

Red   Black

Blue   Gray

From Power Supply

V+
V-

Note: The power supply must be a UL Listed, power-limited access control power supply

Maglock (Fail-Safe)

Wiring an Electric Door Strike (Fail-Secure)

1. Connect the red wire (V+) to the blue wire (common), and then connect them to the positive on the power supply.
2. Connect the green wire (normally open) to the positive on the strike.
3. Connect the black wire (V-) to the negative on the strike, and then connect them both to the negative on the power supply.

Red   Black

Green   V+

V-

Blue

From Power Supply

V+
V-

Note: The power supply must be a UL Listed, power-limited access control power supply
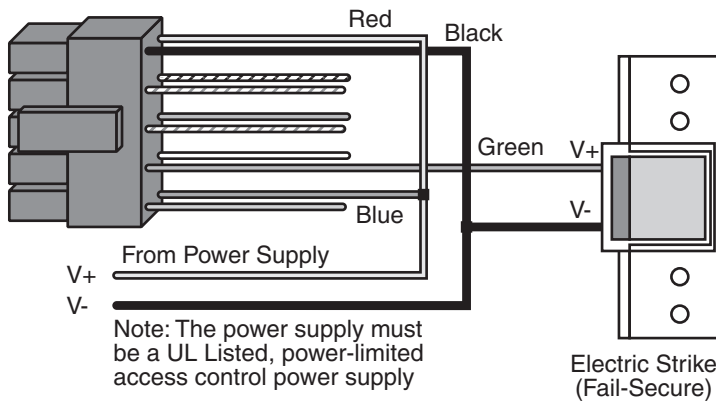
Electric Strike (Fail-Secure)

Shunting a Normally Closed Zone

1. Connect the blue wire (common) to the common connection on the door position switch.
2. Connect the green wire (normally open) to the normally closed connection on the door position switch.

To Alarm Panel

Green

Blue

To Alarm Panel

## Wiring the REX and Door Position Switch

1. Connect the brown wire (REX Input) to the normally open connection on the REX device.
2. Connect the white/orange wire (loop common) to the common on the REX device and the common on the door switch.
3. Connect the white wire (door loop) to the normally closed connection on the door switch.

EXIT

Brown   Normally Open Momentary Contact

White   White/Orange

Normally Closed Door Switch
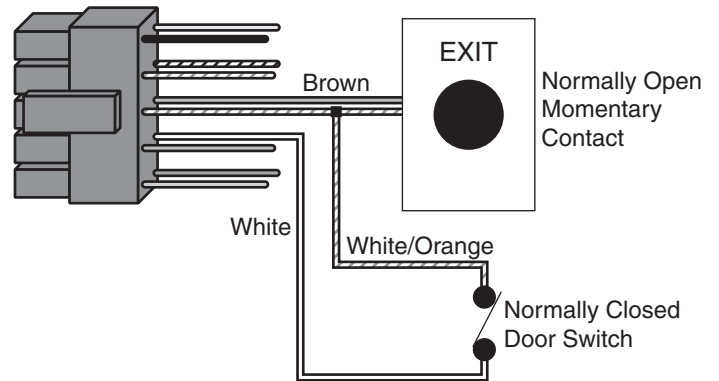
Note: By default, the forced door and propped door outputs are assigned to the audio alerts. When you power up the keypad for the first time and door contacts are not connected, you may hear audio alert #1 immediately followed by audio alert # 2 thirty seconds later. If you are not using door contacts you must either short the white and white/orange wires together or disable the audio alerts.

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Wiegand Front End Wiring Diagram

To use the keypad as a Wiegand Front End, connect the red, black white/black, white/yellow and brown wires on the main keypad wire harness to the corresponding terminals on the UL Listed compatible Wiegand control panel. The drain wire must be connected at the panel side only. Refer to the wiring distance and gauge in the specifications chart.

To Keypad — To Wiegand Panel

Black V-
Red V+
White/Black Data 0
White/Yellow Data 1
Brown LED 1

Drain Wire
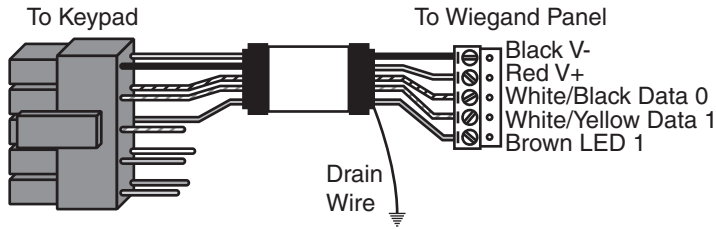
Changing the Master Code

The first step in setting up your keypad is to enter program mode and change the master code. The default master code is 1234.

1. Enter Program Mode
   Press: 99 # master code * (Yellow LED Flashes Slowly)
2. Change Master Code
   Press: 1 # new master code * repeat code * (Yellow LED Flashes Slowly)
3. Exit Program Mode
   Press: * (Yellow LED Stops Flashing)

Programming a Supervisor Code

Use the following command sequence to program a supervisor code, which is stored user location 2. The supervisor is only allowed to add, delete and disable users .

1. Enter Program Mode
   Press: 99 # master code * (Yellow LED Flashes Slowly)
2. Change Supervisor Code
   Press: 2 # supervisor code * repeat code * (Yellow LED Flashes Slowly)
3. Exit Program Mode
   Press: * (Yellow LED Stops Flashing)

Selecting Wiegand Front End Mode

To select Wiegand Front End Mode, use the following steps:

1. Enter Program Mode
   Press: 99 # master code * (Yellow LED Flashes Slowly)
2. Select Wiegand Front End Mode, press:
   1032 # 0 # 1 # ** (Yellow LED Flashes Slowly)
3. Exit Program Mode
   Press * (Yellow LED Stops Flashing)
4. Any other LED blinking sequence indicates a programming error. Repeat the steps listed above to correct the problem.

Selecting Standalone Mode

Standalone Mode is the default operating mode. If you've changed the operating mode and want to revert back to Standalone Mode, use the following steps:

1. Enter Program Mode
   Press: 99 # master code * (Yellow LED Flashes Slowly)
2. Select Standalone Mode
   Press: 1032 # 0 # 0 # ** (Yellow LED Flashes Slowly)
3. Exit Program Mode
   Press * (Yellow LED Stops Flashing)
4. Any other LED blinking sequence indicates a programming error. Repeat the steps listed above to correct the problem.

Note: If the unit is not connected, the Yellow LED turns on solid after the yellow flash. Press the * key to clear.

Programming Users
(Standalone Mode Only)

The unit can hold up to 500 users. Codes are 1 to 10 digits in length.

Command/Action	Keys to Enter/Details
Add Standard User (short)	user location # code * code *
Add Standard User with Specific Unlock Time	unlock time # user location # code * code *
Add Enhanced User	60 # user type # user location # code * code *
Add User to Trigger Specific Outputs (Lock, OUT2-10)	59 # outputs # user location # code * code * (1 = Lock, 2 = OUT2, 3 = OUT 3, Etc)
Disable User	56 # 0/1 # user location # ** (0 = enabled; 1 = disabled)
Delete User	user location # **

User Types
(Standalone Mode Only)

User Types	Description
Toggle User (0)	A toggle user latches the Lock Output like an on/off switch. When you enter the code the first time, the Lock Output is activated and remains activated until you enter any toggle code.
Standard User (1)	This user type is a standard timed user that activates the lock output for the time duration programmed with command 11 or with the master code.
Lockout User (3)	A Locks Out User is used to lock out users from the keypad. After entering a lock out code, users in a higher user location are denied access. To clear a lock out, enter the same lock out code you used to enter lock out mode.
Single Use Code (5)	This user code can only be used once. After entering the code, the user is deleted from memory. To verify a single use code is still programed, enter 5 # code *. If the code wasn't used, the green LED flashes for ½ a second.
Emergency User (7)	An emergency user operates as a standard timed user, with one exception, it can't be Locked Out by a lock out user.
Duress User (8)	The duress user is another type of emergency user. This user activates both the Lock and Duress Outputs. You would use this code if you wanted to activate an alarm, as well as gain entrance through the door.
Two-Part User Type A (9)	This user type is one half of a two-part user combination. When you enter a type A user code, you must enter a Type B user code to gain access through the door. After entering the code the bi-color LED alternates red and green. You have 15 seconds to enter the second code.
Two-Part User Type B (10)	This user type is the second half of a two-part user combination. After entering a Type B code you must enter a Type A code to gain access through the door.

Assigning Virtual Outputs to Physical Outputs
(Standalone Mode Only)

The keypad is equipped with nineteen Virtual Outputs and twelve Physical Outputs. Virtual Outputs are functions that you can assign to operate any Physical Output. Physical Outputs include the main relay and the two audio alerts on the keypad..

- Using command 10, you can assign any Virtual Output to any Physical Output or disable a Physical Output.
- Each Physical Output can have multiple Virtual Output assigned to it.

Assigning Outputs
(Standalone Mode Only)

Command/Action	Keys to Enter/Details
Assign Outputs	10 # virtual output # physical output # **
Virtual Outputs	Physical Outputs
1 – Lock Output	1 – Main Relay
2 – Alarm Shunt	2 – Aux Relay
3 – Propped Door	
4 – Forced Door	
5 – OUT2	
6 – OUT3	
7 – OUT4	
8 – OUT5	
9 – OUT6	
10 – OUT7	
11 – OUT8	11 – Audio Alert 1
12 – OUT9	12 – Audio Alert 2
13 – OUT10	Note: The keypad is equipped with only two relays.
14 – Duress Output	
15 – Panic Output (see page 5)	
16 – Keypad Active Output	
17 – Doorbell Output*	
18 – REX Input Active	
19 – Door Loop Input Active	
*Note: The Doorbell Output also works in both Front End Modes.	
Disable Virtual Output	10 # virtual output # 0 # **
Disable Physical Output	10 # 0 # physical output # **
Programming the REX/Door Loop Outputs (Lock, OUT2-10)	49 # outputs # input # ** Outputs: Lock =1, OUT2 = 2, OUT3 = 3, OUT4 = 4, etc Input: REX = 0; Door Loop = 1)

Note: The default output settings are: Lock Output = Main Relay; Alarm Shunt = Aux Relay; Forced Door = Audio Alert 1; Propped Door = Audio Alert 2.

Programming Output Times
(Standalone Mode Only)

Command/Action	Keys to Enter/Details
Change Lock Output Time	11 # time # 0 # ** (1-255 sec)
Set OUT2 Time Duration	12 # ttt # mmm # **
Set OUT3 Time Duration	13 # ttt # mmm # **
Set OUT4 Time Duration	14 # ttt # mmm # **
Set OUT5 Time Duration	15 # ttt # mmm # **
Set OUT6 Time Duration	16 # ttt # mmm # **
Set OUT7 Time Duration	17 # ttt # mmm # **
Set OUT8 Time Duration	18 # ttt # mmm # **
Set OUT9 Time Duration	19 # ttt # mmm # **
Set OUT10 Time Duration	110 # ttt # mmm # **
Set Propped Door Time	44 # time # 0 # ** (10-990 sec)
Set Forced Door Time	45 # time # 0 # ** (10-990 sec)

Note: OUT2-10: ttt = time units; mmm = multiplier. Ex: "12 # 2 # 5 # **" = 10 seconds (2 time units multiplied by 5 seconds = 10 seconds). The maximum value of ttt and mmm is 255 (255 x 255). The default output times (Lock Output, OUT2-10) are 5 seconds. To toggle the output enter 0 for both ttt and mmm; Ex: 12 # 0 # 0 # **.

Programming Keypad Options
(Default settings are in bold)

Command/Action	Keys to Enter/Details	
Change Keypad Options	30 # option # setting # **	
Option	Setting	
0 – Audio Keypress Feedback	0 = Disabled	1 = Enabled
1 – Visual Keypress Feedback	0 = Disabled	1 = Enabled
2 – Auto Entry	0 = Disabled	1 = Enabled
3 – Error Lockout	0 = Disabled	1 = Enabled
4 – User Lockout	0 = Disabled	1 = Enabled
5 – Two-Part Users	0 = Disabled	1 = Enabled
6 – Keypad Backlighting	0 = Disabled	1 = Enabled
7 – Keypad Backlight Dimming	0 = Disabled	1 = Enabled
8 – REX Processing Select	0 = Only when door closed	1 = Always
9 – Red LED Dimming	0 = Off when backlighting dim	1 = Always On
10 – Door Loop Output Processing	0 = Not when lock latched	1 = Always
16 – Secured Series In/Out	0 = Records IN	1 = Records Out
18 – 8-Bit Burst Output	0 = Disabled	1 = Enabled
19 – WFE Red LED Select	0 = Disabled	1 = Enabled
20 – WFE Red LED Active State	0 = Low	1 = High
21 – WFE Green LED Select	0 = Disabled	1 = Enabled
22 – WFE Green LED Active State	0 = Low	1 = High
Note: WFE means Wiegand Front End		

Programming Keypad Parameters
(Default settings are in bold)

Command/Action	Keys to Enter/Details
Change Keypad Parameters	32 # parameter # value # **
Parameter	Value
0 – Duress Output Duration	1 – 255 Seconds (default = 5)
1 – Panic Output Duration*	1 – 255 Seconds (default = 5)
2 – Error Lockout Threshold	1 – 50 Attempts (default = 3)
3 – Error Lockout Duration	1 – 255 Seconds (default = 10)
4 – Auto-Entry Count	2 – 10 Digits (default = 4)
7 – Auto-Entry Keypress Timeout	2 – 15 Seconds (default = 2)
10 – Wiegand Format	1 – 8 (default = 1, 26-Bit)
11 – Wiegand Pulse Width	1 – 255 (default = 8, 160μS)
12 – Wiegand Interpulse Spacing	1 – 255 (default = 32, 640μS)
Note: Refer to the Wiegand Format Chart below for parameter 8.	
Change Wiegand Parameters	34 # parameter # value # **
Parameter	Value
0 – Wiegand Site ID	Refer to Wiegand Format Chart
1 – Wiegand Group ID	Refer to Wiegand Format Chart
Note: The default setting for both settings is 0.	

*Note: The Panic Output is activated by pressing the * and # keys at the same time. This is used in case of emergency to activate an auxiliary alarm device, such as a siren, that is used to indicate an emergency condition only. This output should not be used to gain access. All access control functionality should be programmed and remain separate from the Panic Output functionality.

Resetting the Keypad
Note: This does not reset the keypad operating mode.

Command/Action	Keys to Enter/Details
Reset Defaults Only	40 # 00000 # 00000 # **
Reset Entire Keypad	46 # 00000 # 00000 # **

Wiegand Format Chart
The keypad supports the following Wiegand formats (parameter 10).

Format Value	Wiegand Format	Largest PIN Value	Largest Site Value	Largest Group Value
1	26 bit	65535	255	N/A
2	28 bit	32767	255	N/A
3	29 bit	524287	255	N/A
4	30 bit	65535	255	15
5	31 bit	65535	255	31
6	32 bit	8191	2047	63
7	36 bit	999999	1023	N/A
8	29 bit	524287	255	N/A

Wiegand Data
When the keypad is configured in Wiegand mode, the keypad data is sent as a complete Wiegand data packet, as though you presented a card.

LED/Sounder Indications

| Indicator	Description
Steady Red*	Door Locked
Steady Green*	Door Unlocked (timed or latched)
Yellow Flashing Slowly	Program Mode
Solid Yellow	Program Error or Error Lockout
Alternating Red/Green	Awaiting 2nd PIN of Two-Part User
LED's Cycling Left to Right	Over Voltage Warning
LED's Cycling Right to Left	Under Voltage Warning
3 Rapid Beeps	Invalid Code
Pair of Double Beeps	User Lockout Activated
Single Double Beep	User Lockout Canceled
1 Long Beep, 1 Short Beep	Access Denied, User Disabled
1 Long Beep, 3 Short Beeps	Access Denied, User Lockout
1 Long Beep, 5 Short Beeps	Access Denied, Code Mismatch
6 Quick Beeps	Toggle Mode Activated
Sounder ¼ sec on, ¼ sec off	Audio Alert 1
Beep Every 2 seconds	Audio Alert 2

*Note: The Red/Green LED descriptions above are for Standalone Mode only. The operation of these LED's in Wiegand Mode is determined by the LED control wire (brown) and how it is configured. The LED control is configured using keypad options 19, 20, 21 and 22, which are programmed with command 30.

Performing the Programming Mode Loopback
The keypad has a special loopback connection you can make to enter program mode if you do not know the master code. Use the following steps below and refer to the diagram.

Note: This procedure should only be performed by a qualified security or lock industry professional.

1. Power down the keypad.
2. Connect the white/yellow, brown and white wires together and disconnect any other connections to these wires.
3. Power up the keypad
4. Change the master code or default the keypad
5. Power down the keypad and remove the loopback connections and reconnect any other wiring to these wires.
6. Power up the keypad.

White/Yellow to Brown and White
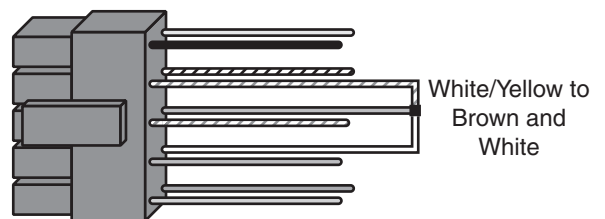
Performing the Keypad Self-Test

After installing the keypad, Schlage recommends that you perform the keypad self-test once a year to ensure that the keypad is working properly.

1. To perform the self-test, with the unit powered up, press the following keys on the keypad: 7890#123456*
2. If all 12 key presses are accepted, the keypad enters self-test mode.
3. The LEDs then turn on one at time with a beep in the following order Red, Yellow then Green.
4. After the Green LED, the unit then flashes an LED to indicate which operating mode the keypad is programmed mode. Below shows which LED flashes for each mode:
   - Standalone Mode: Red Flash
   - Wiegand Front End Mode: Green Flash

Programming Wiegand Front End Mode Options

This section contains programming commands that apply only to Wiegand Front End Mode.

Enabling/Disabling 8-Bit Burst Output

8-Bit Burst Mode is an alternate keypad output format. This mode functions only when the keypad is programmed as a Wiegand Front End. When enabled, normal Wiegand operation is disabled and each key press is sent as a separate 8-bit number. The chart below shows these numbers.

1. Enter Program Mode.
   - Press: 99 # Master Code *
   - The yellow LED flashes slowly.
2. To enable 8-Bit Burst Output, press: 30 # 18 # 1 # **
   - The yellow LED continues to blink slowly.
   - To disable 8-Bit Burst Output, press: 30 # 18 # 0 # **
   - The yellow LED continues to blink slowly.
3. Exit Program Mode.
   - Press: *
   - The yellow LED stops flashing.

Key	Binary Data
1	11100001
2	11010010
3	11000011
4	10110100
5	10100101
6	10010110
7	10000111
8	01111000
9	01101001
0	11110000
*	01011010
#	01001011