



Falcon Elevator Setup

The Falcon system is capable of controlling up to eight (8) elevators. Each elevator can have up to nine (9) floors. The elevators are controlled by a single keypad or APEX device in the elevator or lobby, and a relay board connected to the elevator controls. The Falcon must be assigned an elevator number for each keypad that controls an elevator. For each elevator, the Falcon must be assigned the number of floors for that elevator. For each floor of the elevator, the Falcon must be assigned the following information:

1. Relay Board
2. Relay Number
3. Starting Unit
4. Ending Unit

In addition, the floor specific elevator interface must be installed by the elevator company. If the keypad or APEX device is to be located in the elevator, the elevator company must also install a traveling cable for the keypad.

Typically, the number of floors for an elevator is the number of controlled floors not counting the ground or entry floor. For example, a four (4) story building would have elevators with three (3) floors.

The Relay Board is the selectable unit address of the relay board that controls the elevator.

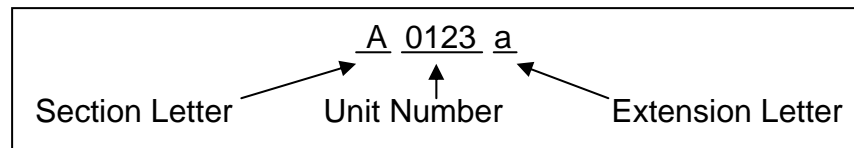
The Relay Number is the relay number on the relay board that controls the elevator access to that floor.

The Starting Unit is the lowest unit number on the controlled floor. The Ending Unit is the highest unit number on the controlled floor. Any users that have unit numbers greater than or equal to the starting unit and less than or equal to the ending unit will have access to this floor. For this reason, the unit numbering scheme that is used with elevators is very important.

The relays are intended to enable the control buttons in the elevator for a specific floor. For example, if the relay for floor 2 is engaged, the user can press the button for floor 2. The system does not intercept the call button for the elevator or enable the lobby button. The lobby button should remain active at all times. If the keypad is not located in the elevator, then it will typically activate the call button instead of specific floors (see Example 7).

When a user attempts to access the elevator from the keypad assigned to the elevator, the Falcon will look up that user's unit number in the database. It will then perform a comparison with the starting and ending units for each floor of the elevator. If the unit is found to be on one of the floors for the elevator, the Falcon will tell the relay board to engage the relay number that enables that floor. If the user has units on more than one floor, the Falcon will engage the relays for all of the authorized floors.

The comparison made by the Falcon is based on both the Section Letter and Unit Number as shown below. The Falcon goes through a comparison for every floor of an elevator. The first step in the comparison routine is to check the section letter. If the unit section letter is less than the starting section letter, the Falcon knows the user unit is not authorized for this floor and exits the comparison routine.



If the unit section letter is greater than the starting section letter then there is no need to check the unit number. The Falcon will set a flag that tells it the user unit is greater than the starting unit and go on to check the ending unit. If the user unit section letter is equal to the starting section letter, the Falcon will check the unit number. If the user unit number is greater than or equal to the starting unit number, the Falcon will set a flag that tells it the user unit is greater or equal to the starting unit and go on to check the ending unit. If not, it knows the user unit is not authorized for this floor exits the comparison routine.

If the flag is set that tells the Falcon the user unit is greater than or equal to the starting unit, the Falcon will check the ending unit. If the user section letter is greater than the ending section letter, the Falcon knows the user is not authorized for this floor and exits the comparison routine.

If the user section letter is less than the ending section letter, the Falcon knows the user is authorized to access this floor. It will set a flag that tells it the user is authorized and exit the comparison routine.

If the user section letter is equal to the ending section letter, the Falcon will compare the user unit number with the ending unit number. If the user unit number is less than or equal to the ending unit number, the Falcon knows the user is authorized to access this floor. It will set a flag that tells it the user is authorized and exit the comparison routine. If the user unit number is greater than the ending unit number, the Falcon knows the user is not authorized for this floor and will exit the comparison routine.

If the Falcon is set to display section numbers instead of section letters, the comparisons will be done in the same manner. The easiest way to think of this is to assign the letter A to number 1, B to 2 and so on. The Falcon will still compare the section first before looking at the unit.

This comparison routine is run once for each floor of an elevator. Because of the nature of this comparison routine, care must be taken when assigning unit numbers to make sure there is no overlap between floors.

Note: Any user assigned to the exempt time zone will automatically be given access to all floors of an elevator regardless of unit number.

The following pages contain examples of elevator setups.

Example 1:

This is an example of simple unit numbering.

Floor 1 has the following units:

A0001 – A0299

Floor 2 has the following units:

B0001 – B0299

Floor 3 has the following units:

C0001 – C0200

Floor 4 has the following units:

D0001 – D0200

The elevator will be controlled by relay board #16. Since the Falcon only controls access to floors 2 – 4, it will only need to use the first three (3) relays on the relay board.

The elevator would be setup as follows:

Number of floors: 3

Floor #1 will be set up as follows:

Relay Board: 16

Relay Number: 1

Starting Unit: B0001

Ending Unit: B0299

Floor #2 will be set up as follows:

Relay Board: 16

Relay Number: 2

Starting Unit: C0001

Ending Unit: C0299

Floor #3 will be set up as follows:

Relay Board: 16

Relay Number: 3

Starting Unit: D0001

Ending Unit: D0299

Since there is no overlap between any of the unit numbers on the floors, this example will work very well.

Example 2:

This is another example of simple unit numbering.

Floor 1 has the following units:

A0001 – A0199

Floor 2 has the following units:

A0200 – A0399

Floor 3 has the following units:

A0400 – A0599

Floor 4 has the following units:

A0600 – A0799

The elevator will be controlled by relay board #17. Since the Falcon only controls access to floors 2 – 4, it will only need to use the first three (3) relays on the relay board.

The elevator would be setup as follows:

Number of floors: 3

Floor #1 will be set up as follows:

Relay Board: 17

Relay Number: 1

Starting Unit: A0200

Ending Unit: A0399

Floor #2 will be set up as follows:

Relay Board: 17

Relay Number: 2

Starting Unit: A0400

Ending Unit: A0599

Floor #3 will be set up as follows:

Relay Board: 17

Relay Number: 3

Starting Unit: A0600

Ending Unit: A0799

This example is shows how the elevator might be configured for a building number A on a site with multiple buildings. Again, since there is no overlap between any of the unit numbers on the floors, this example will work very well.

Example 3:

This is an example of more complex unit numbering.

Floor 1 has the following units:

A0001 – A0199, B0001 – B0099, and C0001 – C0124

Floor 2 has the following units:

D0001 – D0199, E0001 – E0050, and F0001 – F0119

Floor 3 has the following units:

G0001 – G0200, H0001 – H0212, and I0001 – I0089

Floor 4 has the following units:

J0001 – J0202, and K001 – K0312

The elevator will be controlled by relay board #12. Since the Falcon only controls access to floors 2 – 4, it will only need to use the first three (3) relays on the relay board.

The elevator would be setup as follows:

Number of floors: 3

Floor #1 will be set up as follows:

Relay Board: 12

Relay Number: 1

Starting Unit: D0001

Ending Unit: F0119

Floor #2 will be set up as follows:

Relay Board: 12

Relay Number: 2

Starting Unit: G0001

Ending Unit: I0089

Floor #3 will be set up as follows:

Relay Board: 12

Relay Number: 3

Starting Unit: J0001

Ending Unit: K0312

Again, since there is no overlap between any of the unit numbers on the floors, this example will work very well.

Example 4:

This is an example of very complex unit numbering that **will not work**.

Floor 1 has the following units:

A0101 – A0135, B0101 – B0153, and C0101 – C0121

Floor 2 has the following units:

A0201 – A0237, B0203 – B0247, and C0201 – C0249

Floor 3 has the following units:

A0301 – A0327, B0328 – B0367, and C0312 – C0365

The elevator will be controlled by relay board #19. Since the Falcon only controls access to floors 2 – 3, it will only need to use the first two (2) relays on the relay board.

The elevator would be setup as follows:

Number of floors: 2

Floor #1 will be set up as follows:

Relay Board: 19
Relay Number: 1
Starting Unit: A0201
Ending Unit: C0249

Floor #2 will be set up as follows:

Relay Board: 19
Relay Number: 2
Starting Unit: A0301
Ending Unit: C0365

This example has several problems. Unit B367 is on the top floor. But, since B367 falls between A0201 and C0249, it will activate all floors for the elevator. Because of the comparisons made, any unit greater than A0201 and less than C0249 will be given access to floor #1 (the second floor). This includes A0301 – A0327 (assigned to floor 3), and any unit in section B (on any floor). Any user assigned to section B will have access to all floors. Because of this overlap, **this example will NOT work properly.**

Example 5:

Now consider one of the most complex of configurations. Let's say that you have a four (4) story building built on the side of a hill or adjacent to a two (2) story parking garage. You have a lobby entrance on the ground floor and one on the second floor. Access to the building lobbies is controlled by keypads at the entrances to the building.

In this example, any user in the building can enter on either the first or second floors (see the next example for the same configuration with greater security). The elevator keypad would be located in the elevator. The call button will open the elevator door allowing access to the keypad. The elevator buttons for the first and second floors must always be enabled. This will allow a user on the fourth floor to select which lobby to return to from the fourth floor. At the same time, a user on the first floor can enter on the second and use the elevator to access the first floor. He can then return to the second floor using the elevator. Any user who enters the building can access floors 1 and 2 without entering a code at the elevator. Because the first and second floors are always enabled, the Falcon is only controlling access to the third and fourth floors.

Floor 1 has the following units:

A0100 – A0199

Floor 2 has the following units:

A0200 – A0299

Floor 3 has the following units:

A0300 – A0399

Floor 4 has the following units:

A0400 – A0499

The elevator will be controlled by relay board #7. Since the Falcon only controls access to the third and fourth floors, it will use the first two (2) relays on the relay board.

The elevator would be setup as follows:

Number of floors: 2

Floor #1 will be set up as follows: (controls access to the third floor)

Relay Board: 7

Relay Number: 1

Starting Unit: A0300

Ending Unit: A0399

Floor #2 will be set up as follows: (controls access to the fourth floor)

Relay Board: 7

Relay Number: 2

Starting Unit: A0400

Ending Unit: A0299

Example 6:

Now let's consider a more secure version of the previous example. The elevator will be set up according to example 5. However, we will now control the access to the first and second floors through external keypads. These keypads are not linked in any way to the elevator. The keypad on the first floor will be configured to allow users on the first, third and fourth floors to enter. The keypad on the second floor will allow users on the second, third and fourth floors to enter. In other words, users on the first floor can only enter through the first floor keypad. Users on the second floor can only enter on the second floor. Users on the third and fourth floors can enter at either keypad. (Exempt users can enter at any point and have access to all floors).

To make this configuration work, you will need to set up three different time zones. For this example, let's use time zones 4, 5 and 6. Users on the first floor would be assigned to time zone 4. Users on the second floor would be assigned to time zone 5. Users on the third and fourth floors would be assigned to time zone 6.

The keypad at the lobby door on the first floor will be configured in time zones 4 and 6. This will allow users on the first floor (time zone 4) and the third and fourth floors (time zone 6) to enter the building through the first floor lobby. Users on the second floor (time zone 5) will be denied access to the first floor.

The keypad at the lobby door on the second floor will be configured in time zones 5 and 6. This will allow users on the second floor (time zone 5) and the third and fourth floors (time zone 6) to enter the building through the second floor lobby door. Users on the first floor (time zone 4) will be denied access to the second floor.

Because the first and second floors in the elevator are always enabled, we have to put additional keypads outside the elevator to control access to the elevator call button. These keypads will be installed on the wall next to the elevator on the first and second floors. The relays on the keypads will be connected to the elevator call button. Both keypads will be assigned to time zone 6. This will prevent any user on the first or second floor from accessing the elevator. The elevator keypad would still be inside the elevator. The drawback to this is that any user would have to enter his or her code three times; first to enter the building, second to access the elevator, and third to access the floor.

To eliminate the third code entry and reduce cost, the keypads outside the elevator can both be assigned to control the same elevator. This eliminates the need for a keypad in the elevator and will require a user to enter his or her code only twice; first to enter the building and second to access the elevator. The drawback to this configuration is for users that have units on both the third and fourth floors. A user with a unit on both floors would have to return to one of the lobbies before going to the other floor.

Example 7:

This example is for a single keypad controlling access to a building and elevator simultaneously. In this example, an APEX keypad is being used in a lobby that has free entry and exit. The lobby has one door that controls access to the first floor and one elevator that controls access to the second floor.

Floor 1 has the following units:

A0001 to A0125

Floor 2 has the following units:

B0001 to B0119

In this application, the APEX (remote address 3) will be set up to control the elevator and act as the relay board for the elevator (two relays).

The elevator will be set up as follows:

Number of Floors: 2

Floor #1 will be set up as follows (controls access to the first floor):

Relay Board: 3

Relay Number: 1

Starting Unit: A0001

Ending Unit: A0125

Floor #2 will be set up as follows (controls access to the second floor):

Relay Board: 3

Relay Number: 2

Starting Unit: B0001

Ending Unit: B0119

Relay #1 on the APEX will be connected to control the door strike for the door from the lobby to the first floor units. Relay #2 will be connected to the elevator controls and will activate either the elevator call button, or the second floor button.

Tenants on the first floor can access the door to the units but cannot access the elevator. Tenants on the second floor can access the elevator (and subsequently the second floor units) but cannot access the first floor units.

If more than two floors are in the building, the second and higher floors can be accessed by setting the second floor ending unit to the highest unit number on the highest floor and using the APEX relay #2 to activate the elevator call button. For a more secure installation, the call button can remain active and a relay board can be connected to the elevator controls to enable the floor buttons in the elevator.