

GUIDE TO THE
SENTEX INFINITY SYSTEM
TELEPHONE ENTRY SYSTEM

Sentexsystems

PART 1 THE INFINITY SYSTEM

The Infinity system is one of the most powerful and flexible access control systems in existence today. Yet, its user-friendly design also makes it one of the easiest to use. This section gives you an overview of how the system operates before we enter into a detailed discussion of the decisions you must make in specifying an Infinity system.

There are actually five series of systems that are covered by the name Infinity, each of which has a letter designation.

- The "**L**" **series** is a telephone entry system which features a large liquid crystal display (LCD) that provides an electronic directory using pages of 24 names at a time. In addition, it can display directions and feedback for visitors and for programming the system on-site. The Infinity L unit offers card and/or code access control for two doors.
- The "**M**" **series** has the same capabilities as the "L" series; but it has a 2-line by 20 character LCD display with characters 1/2" high. The electronic display on the "M" series displays one name at a time and allows fast forward and reverse capabilities.
- The "**S**" **series** is like the "M" series, except that the LCD display has 2-lines with 16-characters on each line that are 3/8" high.
- The "**B**" **series** is a card/code access-only system that comes in an enclosure which must be installed in a controlled area. It does not have an LCD display.
- The "**DI**" **series** has the same capabilities as the "L" series, but uses a typed directory instead of the electronic directory.

Each of these systems can be used on a stand-alone basis; or any combination of the systems can be linked using Multi-Link firmware (see Part 2, Section A) to control up to 32 doors or gates. There is also an Auxiliary Relay Module (Part 2, Section F) that can be used as part of the Multi-Link "chain" of Infinity systems to control elevator access on a floor-by-floor basis for visitors and occupants, or to provide area-by-area control of Heating, Ventilation, and Air Conditioning (HVAC) and/or lighting.

All Infinity series can carry out the functions discussed below unless otherwise noted:

1. **TELEPHONE ENTRY** (Not available on "B" series): The Infinity system can store, recall, and dial the telephone numbers of the building's occupants and responds to signals from their telephones to unlock a door or activate a gate operator. Normally, the Infinity dials the occupant's telephone through the public telephone network, which results in the monthly and per call charges that any business telephone would incur. However, if the "No Phone Bill Interface" is purchased (see Part 2, Section B), the system rings the occupant's telephone directly without using the public telephone network. Thus, a monthly telephone bill is not generated and there is no per call charge. The occupant may activate any of four relays in the system to grant access or perform other control functions (the system will recognize a tone or rotary signal for the main relay, but only tone signals for the other three relays). The occupant may also hang up the system without granting access. A record of this event is sent to each of the system's two RS-232 serial ports (either of which can be hooked to a printer for real time recording of activity) and is also stored in a "transaction" memory that retains the most recent events. The transaction memory can be accessed at any time to review system activity. All transaction records include the time and date (taken from the system's 365 day clock/calendar) as well as the source of the activity, the name of the person involved, and the action taken by the system.
2. **CARD/CODE ENTRY** (Optional in the "L", "M", "S", and "DI" series): The Infinity system can be used to control access by people who have been authorized to be inside the building or complex. This can be accomplished using entry codes (4- or 5- digits) or cards (Proximity, Weigand, Barium Ferrite, and Klikcard technologies are available). Each code or card is unique and thus validated, restricted, and/or invalidated individually as desired (cards may also be group loaded).

The Infinity system allows you to restrict the use of entry codes/cards by using one or more of the following features:

Door/Gate Restrictions allow you to restrict access of a given card/entry code to a specific door/gate.

Time Zones limit the days and/or times that a given card/entry code is valid. There are seven restricted "time zones" each of which can contain up to three time periods per week during which access will be granted. These multiple time periods accommodate split work shifts, time zones that extend past midnight, and different access times on different days.

Anti-passback is a feature which greatly reduces the possibility of a card/entry code being used by more than one person. "True Anti-Passback" restricts the card/entry code by requiring that it be used to exit before it can be used to enter again (and vice versa). "Timed Anti-Passback" restricts the card/entry code by requiring a specific period of time to pass before you are able to use that card/code again on that reader/keypad.

Date-Limited Codes are special cards/entry codes that will become invalid after a specific date which you specify. These cards/codes can only be used on Infinity systems that have full-control codes with names and they can ONLY be programmed using SPS (versions 1.02 or later) or SPSWin (versions 1.02 or later). They may not be programmed from any other programming source.

Use-Limited Codes are special cards/entry codes that will become invalid after a specific number of uses which you specify. These cards/codes can only be used with Infinity systems that have Multi-Link firmware and full-control codes with names. In addition, they can ONLY be programmed using SPS (versions 1.02 or later) or SPSWin (versions 1.02 or later). They may not be programmed from any other programming source.

Cards or codes that provide the ability to restrict access by time, day, or usage are called "full-control" codes. "Full control" codes are standard in the "B" series, but are optional in the "L", "S", "M", and "DI" series. You may also be able to associate a name with each full-control code or card. "Simple" entry codes (which provide no ability to restrict access by time, day, or usage) are standard in the "L", "S", "M" and "DI" series.

Every time a code/card is used in the system, the transaction can be recorded on the system's printer (optional) and stored in a "transaction buffer" memory.

3. **ALARM SHUNTING OR SIGNALING:** The Infinity system has four relays as standard equipment. Two of these relays are always used to control a door, gate, or any auxiliary device. The remaining two relays can also be used to control auxiliary devices or they may be used to shunt alarm contacts or signal an alarm condition for the doors controlled by the first two relays.
4. **TIMED ACTIVATION AND DEACTIVATION OF RELAYS:** The Infinity system has a 365 day clock/calendar as a standard feature. The system can use this clock to automatically activate and deactivate any of the four relays (up to three times per day for each relay). The system can also accommodate a schedule of 16 holidays during which these timed schedules will not operate - unless your customer wants them to operate on the holidays also. All timed activity can be sent to devices connected to the two RS-232 ports, and is stored in the event/transaction memory.
5. **DIRECT OPERATOR CONTROL OF RELAYS:** The Infinity system allows direct control of the four relays by the system operator. The operator can latch a relay for an indefinite period (until a given command to unlatch) or activate them only for a preprogrammed period of time (up to 99 seconds). All operator controlled activity can be sent to devices, such as a printer, connected to the two RS-232 serial ports, and is stored in the event/transaction memory.

6. **DOOR STATUS MONITORING:** The Infinity system can monitor the status of either door controlled by the system. If the required sensors are installed, the system will respond if a controlled door is held open for more than 60 seconds longer than the system's programmed door unlock period or if a controlled door is opened without being unlocked by the system. If either of these two conditions occur, the system can be programmed to respond in either or both of the following ways:
 - A) Place a call to a preprogrammed telephone number and inform the recipient that a problem is occurring (this is done via modem).
 - B) Close a relay to turn on a light, activate a siren, or inform an alarm monitoring station.The system will also undertake these actions if someone enters too many incorrect entry codes consecutively within a 3 minute period. This number of incorrect entries is programmable from 1 to 9. All "alarm" conditions are recorded on the printer, if the system is equipped with one, and are also stored in the event/transaction memory.
7. **FREE EXIT:** The Infinity system has the capability of allowing "free exit" through either controlled entry to make sure that someone who entered the building properly does not cause the system to think that the door is being forced open when they leave.
8. **ACCESS FOR POST OFFICE AND FIRE DEPARTMENT:** Connections are included in the system to make sure that the post office and fire department can gain access to the facility without having to contact anyone to let them in.

PART 2 OPTIONS TO CONSIDER IN SPECIFYING AN INFINITY SYSTEM

The family of Infinity systems provides you with the ability to tailor an access control system to meet almost any application effectively and inexpensively. This flexibility is the result of a number of optional features that you may consider when specifying an Infinity system. These options are:

1. Stand-alone vs. linked operation
2. Telephone entry
3. Card and/or code entry
4. System programming
5. Programming and analysis software
6. Elevator, HVAC, and lighting control
7. Miscellaneous options

Each of these areas is discussed in turn in the remainder of this guide.

A. STAND-ALONE VS. LINKED OPERATION

Infinity systems can be used on a stand-alone basis or they can be linked together in an "open" chain (i.e., the first unit and the last unit are not directly wired to each other) using Multi-Link firmware. Multi-Link firmware lets you create a "chain" of up to 16 Infinity systems (of any type) that can control access through up to 32 doors and/or gates. In addition, the chain provides centralized programming, integrated event record printing, and distributed processing of all access decisions. It also allows use of the Auxiliary Relay Module (ARM) for elevator, HVAC, or lighting control applications (see Section F for further details).

Multi-Link firmware is a no-cost option on all Infinity series, but it must be specified at the time you order the equipment. Importantly, Infinity systems operating with Multi-Link firmware are just as user-friendly and easy to operate as those which contain the stand-alone version of firmware.

The decision about which configuration to use will be a function of the number of doors you need to control and the cost of wiring between them. If your application requires two or more Infinity systems and wiring is not overly expensive, you will almost certainly want to link the systems together and use Multi-Link firmware. The distance between systems is not a concern (other than in the cost of wiring) since Multi-Link systems now have, as standard equipment, short-haul modems that can reliably transmit data for up to 5000 feet. If wiring between systems is too expensive, you can operate each system on a stand-alone basis, or create several smaller chains in which distance and cost considerations are acceptable.

B. TELEPHONE ENTRY

The telephone entry capability is standard in the "L", "M", "S", and "DI" series. It is not available on the "B" series. However, there are a number of options to consider that determine how this capability will be utilized:

1. **"NO PHONE BILL" INTERFACE:** The "No Phone Bill" Interface (known as NPBI) allows an Infinity to operate without generating monthly or per call charges. The Infinity is connected to the NPBI which in turn is connected to a series of Line Interface Boards (LIBs). Each LIB connects into the telephone lines of up to 12 building occupants via RJ71 jacks (these jacks are generally installed by the telephone company). Thus, for example, a 135 unit apartment building will require one NPBI and 12 LIBs. Two LIB housings, each of which holds and provides power for up to 10 LIBs, would also be required. **Please Note:** The NPBI makes it more difficult to utilize the Infinity system's internal modem. If you wish to use both capabilities in the same application, please call your Sentex sales representative for more information.

2. **HANDSET OR HANDS-FREE COMMUNICATIONS:** The Infinity is available in configurations that will communicate using telephone handset or in a hands-free (speakerphone) mode.
3. **NUMBER OF TELEPHONE NUMBERS TO BE DIALED:** Infinity system capacities reflect the number of directory codes, telephone numbers, and names that the system memory will hold. Thus, a 115 capacity system will hold 115 directory codes, names, and telephone numbers.
4. **EXTRA NAMES FOR THE DIRECTORY ("L", "M", and "S" series only):** In some situations, the number of names required on the directory will be more than the number of telephone numbers to be called (e.g., when roommates share apartments). In these cases, you may order additional names on the directory in groups of 25 names. Thus, if there were 100 apartments in a building, but 135 names to display on the directory, you could specify a 115 capacity system with 25 extra names in the directory rather than a 250 capacity system.
5. **LENGTH OF NAME ON DIRECTORY ("L" series only):** The Infinity "L" series system allows 13 character directory names. This limit will not be a problem for most residential buildings, but will probably not be acceptable for many commercial buildings. Thus, you may order an "L" series with a "Commercial Building Directory" option that allows directory names to be 35 characters long. The number of names per page is reduced to 12 with this option.
6. **MULTIPLE ENTRY:** If more than one telephone entry system is required in an application, you may have the systems share one telephone line by including the multiple entry option in each unit. This option ensures that a conversation on one system is not interrupted by someone trying to use one of the other systems. There is no extra installation time or wiring required for this option - the telephone company will just put extensions of the same line at each location. **NOTE:** This option cannot be used if the systems are using "stand-alone" firmware and are to be programmed via modem.
7. **SPECIAL PACKAGE FOR OUTDOOR INSTALLATIONS:** The high contrast and bright backlight of the Infinity LCDs can make them easy to read under most conditions. However, excessive glare can make the displays difficult to see. Thus, we strongly recommend that you include the "outdoor installation" package whenever an Infinity "L", "M", and "S" will be installed in a location where the sun will frequently be shining on the Infinity or the person using the Infinity.

In the case of the "L" series system, there are two forms of the outdoor installation package. One package includes a stainless steel hood which minimizes the amount of direct sunlight hitting the LCD screen. The other outdoor package includes a coating on both the LCD and the lexan window, as well as fans to keep the LCD cool. If the outdoor installation option is not installed, the LCD may "blush" and become hard to read at high temperatures or when it is in the direct sunlight. The "M" and "S" series outdoor installation packages consist of a coating over both the LCD and the lexan window. It does not require fans to operate under these conditions.
8. **HEATER FOR COLD WEATHER INSTALLATIONS:** The "L" series will operate normally until the temperature gets to 0 degrees Fahrenheit. Below the temperature, the display takes quite a long time to change from one screen to the next and becomes very difficult to use. Thus, the heater option should be ordered if the system will be exposed to sub-zero temperatures. The "M" and "S" series do not require a heater to operate in sub-zero temperatures.
9. **SURFACE OR FLUSH MOUNTING:** The "L", "M", "S", and "DI" series systems are designed for surface mounting as a standard procedure. A kit is available that will allow each of these systems to be "flush mounted" into a wall (only the faceplate extends past the wall surface). See the appendix for dimensions.

C. CODE AND/OR CARD ENTRY

The Infinity "B" series systems will handle card and/or code entry as a standard feature, and allow either means of entry to be controlled with time zones, door restrictions, and/or anti-passback. The "L", "M", "S", and "DI" series have "simple" entry codes (the code is either invalid or is valid at all times and all doors) as a standard feature. Card entry and "full control" code entry (identical to the capability in the "B" series) are available as options.

Use of the card and/or code capabilities requires you to make several decisions (besides the basic choice of whether to use cards, codes, or both):

1. **NUMBER OF CARDS/CODES TO BE USED:** If you have the "simple" entry codes for the "L", "M", "S", and "DI" series, you get one code per telephone number. Thus, a 115 capacity system will have 115 entry codes. However, if you choose to use cards or full-control codes, you must specify what capacity you will need (this decision is always required in the "B" series).

If you are using the card/full control code option in an "L", "M", "S", or "DI" series and your application requires a large number of cards and/or codes, you will need to consider the memory space required for the telephone numbers and names. These series can easily handle 1000 telephone numbers/names and 2000 cards and/or codes with names (see next point) or 8000 cards and/or codes without names. If you need a larger capacity, please call you Sentex sales representative for more information.

2. **NAMES ASSOCIATED WITH CARDS OR CODES:** The same memory space (and thus the same price) will provide capacity for a certain number of cards or full-control codes that cannot have names associated with them or a smaller number that may have 13 character names (including all punctuation and spaces) associated with them. The name is included when a card or code use is printed and when a complete list of cards or codes is printed or displayed.
3. **TYPE OF CARD, CARD READER, AND/OR KEYPAD:** If you are using entry codes, your only decision is whether any remote keypads will be contained in an outdoor housing or in a flush mount bezel that mounts on any two-gang electrical box. The outdoor housings are available with or without lights.

If you are using cards, the decision of which card and reader technology to use is more complicated. You have four basic choices.

- ◆ **Clickcard** radio transmitters and receivers are the most convenient of the technologies in drive-up applications because the transmitters can be read from up to 150 feet away from the gate without rolling down the car window during a rain or snow storm. However, this is also the most expensive card reader.
- ◆ **Proximity** is the next most convenient technology, with the card being read when it is passed within 4 to 6 inches of the reader. This reduces lost cards since most cards are left in wallets/purses.
- ◆ **Weigand** cards and readers are moderately priced while being reasonably convenient to use and very weather and vandal resistant. The Weigand "key" reader and keys are especially good where space is limited or appearance is critical.
- ◆ **Barium Ferrite** cards and readers are inexpensive and particularly well designed for drive-up applications. They also work well in walk-up applications.

D. SYSTEM PROGRAMMING

There are 5 different methods for programming an Infinity system. Deciding which of these to use is important in putting together any Infinity specification since it can affect the cost and the ease of use of the system.

1. **12 KEY KEYPAD** (not available on the "B" series): This keypad is built into the "L", "M", "S", and "DI" series faceplates. Programming feedback is shown on the LCD (which is optional on the "DI" series). While this method can handle every entry (including names which are entered using two digits for each character), it is not very convenient in most cases. Thus, we recommend that it **not** be the primary programming device, but rather be used only when another form of programming is not available for some reason.

IMPORTANT NOTE: If you are using Multi-Link firmware, this programming method can only be used if an "L" series system is the first unit in the chain.

2. **HANDHELD DATA ENTRY TERMINAL:** This is a very popular form of on-site programming for the "L", "M", and "S" series because of its convenience and low cost. It contains all letters, numbers, and punctuation, so entering names and codes is quite simple. It also has 6 Function keys that allow quick access to the most frequently used programming steps (e.g., entering a telephone number, erasing a code, etc.). Programming feedback is shown on the displays. Since the "B" and "DI" series do not have displays as standard equipment, the hand-held terminal can only be used if you also order the 2-line by 16-character LCD option to provide programming feedback.

IMPORTANT NOTE: If you are using Multi-Link firmware, this programming method can only be used if an "L" series system is the first unit in the chain.

3. **TERMINAL CONNECTED DIRECTLY TO RS-232 SERIAL PORT:** This is a very convenient programming method since the terminal is generally located in the management office. The cost is dependent upon the office's existing equipment and how far the office is from the Infinity.

The terminal function can be performed by two different types of devices

- **Video display terminals** are relatively inexpensive devices whose primary functions are to transmit entries made on the computer-style keyboard and display what is sent back from the Infinity on a CRT screen. They can communicate at high speeds, so programming is quick and easy to follow. A serial printer port allows all reports and transactions to be printed. Any video display terminal used must be "Televideo 910+" compatible.
- **Personal computers** using "terminal emulation" software can be the least expensive and most convenient option if an MS-DOS 3.3-compatible computer already exists in the manager's office. Terminal emulation software is available as a separate item by purchasing the SENTERM software. All software packages are discussed in detail later.

If you are going to have a Multi-Link chain and the office is located more than 200 feet from the first unit in the chain, a Sentex stand-alone short-haul modem can be purchased for connection to the terminal/computer in the office.

4. **TERMINAL CONNECTED VIA MODEM:** This capability will allow an Infinity to be programmed from a remote location with the same ease as if the user were programming it on-site (see point 3 above for discussion of the devices that can perform the terminal function). The modem used at the remote location must be Hayes-compatible and must have the same baud rate as the modem being used at the Infinity location.

The Infinity modem can either be the internal 300 baud or 2400 baud modem (the internal modem is optional in the "B" series) or an external modem connected to the system's RS-232 serial port (external modems can be purchased from either Sentex or most computer stores). In the latter case, the modem speed can be set at any of the Infinity's four selectable baud rates-300, 1200, 2400, or 4800.

IMPORTANT NOTE: *If you are using Multi-Link firmware, you only need to have an internal modem in the first unit in the chain, or an external modem connected to the first unit in the chain.*

5. **TONE DIAL TELEPHONE:** Remote programming via tone dial telephone is an option that can be ordered with any Infinity, except those **with Multi-Link firmware**. It allows the programmer to handle most data entry and deletion tasks through an ordinary tone dial telephone (data retrieval is not possible). Since there is no visual feedback available at the remote site, this option also includes synthesized voice responses and prompts. For example, when the Infinity answers the call, it responds by saying "HELLO", indicating it is ready for the programming access code to be entered. Each letter or number entry is spoken back to the programmer. This option is ideal where programming changes are not frequent and where data retrieval is not necessary. However, for applications in which there will be a high level of change, this option will probably not be convenient enough for the programmer.

E. PROGRAMMING AND ANALYSIS SOFTWARE

There are five software packages available from Sentex that allow you to use a personal computer to program Infinity systems and/or to retrieve and analyze the transaction/event records that they store.

- 1. SENTEX PROGRAMMING SOFTWARE FOR WINDOWS (SPSWin):** SPSWin is a powerful, easy-to-use programming tool. You can program units offline, then upload or download information via modem or direct connection. SPSWin provides reports on unit programming. You can connect to units and directly control their functions, such as cycling or latching relays. Using SPSWin, you can download transaction records from Infinity and Multi-Link units, for use with Event Record Monitoring and Analysis software for Windows (ERMAWin). If a unit's memory should be damaged (e.g., by lightning or vandalism), you can reload the memory with data stored in SPSWin. **NOTE:** You must have Microsoft Windows 95 or 98 to run SPSWin.
- 2. EVENT RECORD MONITORING AND ANALYSIS SOFTWARE FOR WINDOWS:** ERMAWin works in conjunction with SPSWin to provide powerful tools for analyzing transactions retrieved from the unit(s). You can print four different types of reports that illustrate system usage. Once transactions are retrieved from SPSWin, ERMAWin allows you to sort and filter them several different ways, to get exactly the information you need. ERMAWIN provides exporting, archiving and purging features, as well as multiple database capabilities (use for tracking several systems). ERMAWin can also be used for real time monitoring of events at one or more units, via RS-232 direct connection. **NOTE:** You must have both Microsoft Windows 95 or 98 **and** SPSWin to run ERMAWin.

RECOMMENDED
Pentium processor
16 MB of RAM
20 MB hard disk
SVGA monitor
REQUIRED:
Hayes-compatible modem OR an open Com Port
CD ROM Drive
Mouse

Table 1. Hardware Needed To Run Sentex Windows Software.

- 3. SENTEX PROGRAMMING SOFTWARE (SPS):** If you do not have Microsoft Windows, you can run SPS for DOS instead. It has the same capabilities as SPSWin.
- 4. EVENT RECORD MONITORING AND ANALYSIS (ERMA):** ERMA for DOS can be used with SPS for DOS, if you do not have Microsoft Windows.
- 5. SENTERM** (Terminal Emulation Software): This software package can be used with either stand-alone systems or Multi-Link chains. It allows any computer that is compatible with MS-DOS (version 3.3 or higher) to be used as a terminal to communicate with a local system/chain via a direct connection to the system's RS-232 serial port and/or to communicate via modem with systems/chains at remote locations. One important advantage of Senterm over commercially available terminal emulation software is that it properly handles the "printer on/printer off" commands from the Infinity and thus allows you to print all of the reports the Infinity can generate.

F. ELEVATOR, HVAC, AND LIGHTING CONTROL

The Auxiliary Relay Module (ARM) must be used as part of a Multi-Link chain to provide floor-by-floor control of elevator access: **1)** for building occupants (based on the use of a card or code at a card reader or keypad in an elevator or at any other designated reader or keypad in the system); and **2)** for visitors (based on a building occupant granting them access via an Infinity telephone entry system). The ARM may also be used to control HVAC and lighting on an area-by-area basis based on occupant usage of cards or codes at building entrances or at prescribed locations in the building.

The ARM contains 16 SPDT relays each of which can be used to enable one floor button in one elevator or to control the HVAC, lighting, or other function for one area of the building or complex. If more than 16 relays are required to perform the desired control functions, multiple ARMs can be included in the Multi-Link chain.

The ARM also has inputs for two card readers and two keypads (which can be mounted in the elevator cab) to be connected directly to the ARM for faster decision making and lower costs. The EEPROM memory on the ARM always has the capacity for up to 3750 cards or codes (names are standard). Finally, the ARM has dual short haul modems that allow it to operate as part of the Multi-Link chain.

The ARM reviews every event record generated anywhere in the Multi-Link chain - including its own card reader and keypad inputs. For every event in which a building occupant grants access to a visitor or uses a valid card or code, the ARM compares the event "location" and the "group" number of the building occupant involved against the information programmed for each of its 16 relays. The ARM then activates any relays which "match" the event location and group for the period of time specified by the user. The ARM also can activate and deactivate each of its relays based on schedules specified by the user (for example, to allow free elevator access during periods when the building is open to the public).

You will need to program the following information for each of the relays that is going to be used for control functions (this programming is done through the same means used to program the other systems in the Multi-Link chain):

1. **Up to four authorized "locations"**. An authorized location consists of any telephone, card, or code entry point in the chain from which an ARM relay may be activated. For example, an "L" series that controls visitor entry through the front door could be the location which authorizes elevator access to specified floors in the building for visitors. A card reader connected to the ARM and located in the elevator cab could allow a building occupant access to that same floor.
2. **Up to six authorized "groups"**. An authorized group consists of any building occupant(s) who may cause the specified relay to be activated, based on granting access to a visitor or using a card or code at an authorized location. For example, all of the occupants of the third floor of an apartment building would have the same group number since they would all have the ability to activate a relay to provide elevator access to their floor, either for visitors or for themselves.
3. **The time period (from 1 second to over 4 hours) during which the relay will remain activated**, based on the location at which the event occurred. These location-specific activation times allow access to a controlled floor for a different period of time if a visitor is allowed entry through a perimeter door than if a card is used in a reader in the elevator cab by a building occupant. The ability to program the relays to activate for extended periods of time will generally be used when after-hours or weekend HVAC or lighting control is required.
4. **The time period during which you want the relay to activate automatically**. Typically, this would be used to allow unrestricted elevator access if the building was open to the public during normal business hours or to turn the HVAC and lighting on for all tenants during normal business hours.

In combination, these four items give you tremendous flexibility in controlling access to your building. While the most obvious applications are for elevator, HVAC, and lighting control, the ARM can be used to solve almost any auxiliary control challenge.

G. MISCELLANEOUS OPTIONS

In addition to the major decisions discussed above, there are several other options available that you should consider, as described below.

1. **EXPANDED TRANSACTION/EVENT RECORD MEMORY:** All Infinity systems store the most recent 1000 transaction/event records generated by the system as a standard feature. For installations in which there will be a very high level of activity or where the system must be able to retain records for an extended period, there is an option available that will expand the memory to hold 5800 records. Please note that it will take about 15 minutes to retrieve this larger number of records using the Infinity system's built-in 2400 baud modem. Thus, if you intend to retrieve these records on a regular basis, you should have a clear plan for when you will be able to disable the system's telephone capability for this amount of time. These records may, of course, be reviewed locally at any time without disabling the system in any way.
2. **BATTERY BACK-UP FOR THE TRANSACTION MEMORY AND CLOCK:** Most memory functions in the Infinity are handled by the EEPROM memory which is non-volatile. These functions will not be affected by any loss of power to the system. However, there are two exceptions - the transaction memory and the real time clock are held in RAM memory (due to limitations on how often the EEPROM memory can be rewritten). Since the Infinity systems do not have battery back-up as a standard feature, a loss of system power causes the clock to reset and all transactions are lost.

You can avoid this possibility by providing a battery back-up for the entire Infinity (the system requires 12 VDC and will draw between 2.0 and 3.2 amps depending on the features used) or by having the transaction memory/clock battery back-up option installed in the system. Both of these actions will cause the memory and date/time to be retained in the event of a power loss. However, only the first will allow the entire Infinity system to continue operating during the power outage.

3. **REQUEST FOR ACCESS/DOOR POSITION SENSING INPUTS:** Each of the doors that can be controlled by the Infinity has dedicated request for access and door position sensing inputs. The request for access inputs will cause the system to activate the appropriate control relay for the specified period of time when a contact closure is received (for example, from an exit button or motion detector). The door position sensing functions require that a switch be mounted in the door frame so that a contact closure is created when the door is opened. With this switch in place, the door position sensing inputs can perform several functions:
 - A. Deactivate the control relay once the door is opened, thus reducing the chance of "tailgating";
 - B. Set off the appropriate alarm response if the door is still open 60 seconds after the relay activation time has expired; and
 - C. Set off the appropriate alarm response if the door is open at a time when the system has not authorized access through that door.
4. **SURGE SUPPRESSION DEVICES:** Each of the Infinity systems has extensive built-in surge protection. Nonetheless, lightning is a very powerful force and experience suggests that the more protection provided, the greater the chances that the system will survive a nearby strike.

Since the Infinity system is such a powerful tool, we strongly recommend that external surge suppression devices be installed on systems that are located in high lightning strike areas. Sentex can provide two types of surge suppression devices; one for telephone lines and the other for card reader and/or low voltage inputs. For more information regarding these products, ask your sales representative.
5. **CLOSED-CIRCUIT TELEVISION:** You can include a CCTV on the "L", "M", and "S" series. This is a useful security feature. Connect the CCTV to your own monitor or television.

APPENDIX INFINITY INSTALLATION AND WIRING DATA

Dimensions

UNIT TYPE		HEIGHT	WIDTH	DEPTH
"L" & "DI" SERIES	SURFACE MOUNT	21.0"	16 7/16"	4 1/4"
	FLUSH MOUNT BACK BOX	21 1/4"	16 3/4"	3 3/16"
	FLUSH MOUNT TRIM BEZEL	23 11/16"	19 3/16"	
"M" & "S" SERIES	SURFACE MOUNT	16.0"	11 3/4"	3 1/4"
	FLUSH MOUNT BACK BOX	16 7/16"	12 1/4"	2 3/4"
	FLUSH MOUNT TRIM BEZEL	18 3/4"	14 3/4"	
"B" SERIES, AUX. RELAY MOD.	STANDARD BOX	23.0	14.0"	2 3/4"
& NO PHONE BILL INTERFACE	WEATHER-PROOF BOX (B only)	16.0"	12.0"	3 1/4"

Power and Grounding Requirements

Continuous current requirements for the various Infinity series, modules, and interfaces are as follows (not including current required for card reader operation, which can be as high as 0.6 amps):

"L" series = 1.7A (2.1A w/ fans) "DI" series = 1.2A No Phone Bill Interface = 1.0A
 "M" and "S" series = 1.2A "B" series = 0.9A Auxiliary Relay Module = 1.2A

A 12 VAC plug-in transformer is supplied. Transformer must be plugged into a dedicated 120 VAC outlet. Outlet can be up to 75 feet away, if 12 awg wire is used. A 13.5 volt DC power supply may also be used. However, none of these systems/modules provide any charging capability, and any battery system must be self-charging. Wiring requirements are smaller gauge than for the AC transformer.

Grounding the Infinity system is crucial to its proper operation. A minimum 12 awg copper wire must be run from the grounding screw on the system chassis to a good earth ground within 12 feet of the system.

Wiring Requirements

TYPE OF DEVICE OR CONNECTION	TYPE OF CABLE REQUIRED			MAXIMUM WIRE RUN
	# OF COND.	GAUGE	SHIELD	
ALL CARD READERS	5	20-24	Yes	500 feet
Clickcard RECEIVER To Infinity (for data)	5	20-24	Yes	500 feet
To transformer (provided)	2	16	No	500 feet
REMOTE KEYPAD For keypad without lights	7	20	Yes	500 feet
For lights in lighted housing	2	16	No	500 feet
TERMINAL, COMPUTER OR EXTERNAL MODEM	3	20-24	Yes	50 feet*
PRINTER For Stand-alone system	3	20-24	Yes	50 feet*
For Multi-Link chain	5	20-24	Yes	50 feet*
BETWEEN SYSTEMS IN MULTI-LINK CHAIN	2 (twisted)	24	No	5000 feet

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* Short-haul modems are required to communicate over distances in excess of 50 feet. If you will have a Multi-Link chain, dual short-haul modems are provided with the systems. However, you must purchase a stand-alone short-haul modem from Sentex for use with any external device. If short-haul modem is used, maximum distance increases to 5000 feet and twisted pair cable is used.