

# Security & Access Control Handbook

*A practical guide to application and system design*



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## **Security and Access Control Handbook**

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This handbook is for information only and is not intended as a substitute for verbatim legislated requirements.

For authoritative specifications regarding the application of life safety, security, and access control systems, consult current editions of applicable codes and standards. For authoritative interpretation of those codes and standards, consult your local authority having jurisdiction.

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# Foreword

Several years ago, *Access Control & Security Systems Integration* magazine conducted a survey to determine the state of integration used in buildings at the time. Almost 35 per cent of the 790 individual responding to the survey felt that they had an integrated security system. However, the survey left the definition of integration up to the respondents. This isn't surprising: the term, which has become an overworked industry buzzword, defies meaningful definition.

Case in point: to characterize the extension of EST3 architecture to include security and access control as an "integrated" system is to grossly underestimate the impact it has on the way building systems are controlled. EST3 doesn't merely combine separate fire, security, and access control systems – it is a control platform that orchestrates all these functions by means of a single fully-listed infrastructure.

This means shared wiring, shared power supplies, and intelligent devices that sense motion operating on the same data loop as those that detect smoke. It means lower installed costs, infinite programming capabilities, simpler maintenance, and reduced operating costs. It is a method so radically different from what has become known as integration, that the term "integration" does it an injustice. It is a whole that is much greater than the sum of its parts: true Synergy.

Synergy elevates the reliability and survivability of security and access control functions to a level found previously only in dedicated fire alarm systems. By doing so it brings unparalleled stability to building functions that have escaped the kind of intense regulatory scrutiny that fire alarm equipment has been subject to.

But by lowering boundaries that have traditionally existed between building functions, Synergy also challenges system designers, application specialists, and sales personnel in ways that many have never been before. Meeting these challenges calls for a certain finesse that comes with know-how and experience. This handbook is designed to provide the basic know-how so that the experience you gain with Synergy is successful and rewarding.

*Marketing Group  
Edwards Systems Technology, Inc.  
October, 2001*

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# Introduction

This handbook is intended for use by sales and application personnel. Its purpose is a sales reference guide, that provides solutions to typical application scenarios using Synergy enabled components.

Each application scenario is broken into three sections ...

The **Parts** section provides part numbers for the devices described on the page. In this section is a column titled Price. This space is provided so that the individuals using the Handbook can fill in their own prices for estimating a project. Please note that even though a specific device may be indicated in this section, it does not mean that this is the only device that can meet the application.

The **Diagram** section provides a block diagram of how this application may be configured. This diagram does not indicate how a device or devices should be installed. There is usually more than one way to install and locate devices and modules. Each project needs to be verified on-site to see what is the best and most economical method available to install the devices.

A section titled **Sales Tips** provides various bits of information that may help save costs when estimating a specific application or provide additional information on a specific feature or device.

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## **UL Listings for Synergy-enabled EST3**

EST3 has been tested to UL 609, UL 1620, UL 1076, UL 294, UL 365, UL 864, UL 1635, UL 1076, UL 1950, and ULC-S527. The applications discussed in this handbook are intended for general reference purposes only. Specific standards may require additional equipment. Please refer to the EST3 Installation and Service manual, Appendix C, for minimum hardware requirements as they relate to specific UL standards.



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# Security

There are two primary forms of security, physical and electronic. Physical security involves facility guards, structural barriers, crowd control and other elements that physically protect and inhibit damage to facilities. Electronic security involves surveillance, facility management and monitoring of people or facilities by electronic means with minimal human interaction. The Synergy Product Application Handbook will focus on the electronic elements of security, providing common solutions to typical applications.

Within the industry, there are literally hundreds of devices that will accomplish the same basic function for a specific problem. Some devices offer broader application uses while others are specific to individual applications. There is a broad range of prices for devices depending on the grade of security application provided. It is often up to you to determine which device fits the application best and offers the most viable economical approach.

“There is more than one way to skin a cat!” is a saying that applies very well to security. Keep this in mind when designing security solutions for your customers.

## Basic Principles

For the novice user, there are some basic security principles that are good to know and understand. For the purpose of this Handbook, the following explanations will be brief and to the point. There are several publications that go into more detail and these are strongly recommended reading to further your understanding of security principles and application solutions.

### Point Annunciation

Point annunciation provides annunciation at the security display on a per point basis. This is exact event reporting that is very useful, not only to the operator, but to the service organization having to maintain the system.

### Zones/Partitions

Many times devices will be grouped into security zones. This is often done to minimize costs. It is more expensive to provide point annunciation than it is to provide zoned annunciation. Using zones versus point annunciation is often determined not just by cost but also by the application. For example, it may be better to zone a large group of windows on the side of a building that contains magnetic switches rather than individually annunciating each window.

### Interior Protection

Interior protection covers the interior of a facility or area. Devices like motion detectors, photoelectric beams and video motion detection is used for monitoring an area for unauthorized entry. Often a facility monitored by a security control panel is grouped as “Interior” protection and “Perimeter” protection. Having groups allows a user the flexibility to turn off the interior protection group from reporting alarm

events while leaving the perimeter group protection active. This is useful when employees work late at night and want assurance that the facilities perimeter is protected against unauthorized entry.

### **Perimeter Protection**

Perimeter protection covers the exterior entries into a facility. Devices like magnetic switches, outdoor motion detectors and dowels are used for detecting unauthorized entry into a facility or area.

### **Supervisory Monitoring**

Security and fire panels are used to monitor non-security devices like flow switches, sump pumps, temperature devices and counters. Instead of reporting an alarm event when the devices are in an abnormal state, they report a supervisory event. Depending on the type of event, an owner may want to be immediately notified of the event and may want maintenance personnel dispatched when an event is triggered.

### **Duress**

There are a few ways to monitor duress events through a security control panel. The first is to use a duress device, such as a money clip or duress button, that can be activated without detection if the user is threatened. Usually these devices are annunciated at the security control panel and will transmit to a Central Station. The second way, supported in some systems, is to have a special PIN number to turn off the security control panel when a user enters a facility under duress. In this case, the user will enter an additional or different code that will initiate a duress event for transmission to a Central Station. The security panel will operate as normal and will not indicate that the duress event has been initiated, thereby protecting the user from the aggressor. (Synergy-enabled EST3 does not currently support the second duress operation.)

### **Central Station Monitoring**

When an alarm event is reported at the security control panel, the event triggers two things. First is the initiation of a sounder either at the security control panel or throughout the facility. Second is the transmission of the event to a certified alarm monitoring Central Station through phone lines, satellite, cellular or Internet transmission methods. Once received, the Central Station will follow instructions for dispatching police and emergency services and notifying the owner.

### **Synergy Security**

Using the Synergy-enabled components provided for security functions, EST can meet most applications, large and small. The real bonus of providing security function through Synergy-enabled components comes from the benefits of using the EST3 fire alarm backbone. For example, using fire alarm speakers to notify tenants that they have exceeded their security close time does not really cost anything more if you already have the fire alarm system installed with an EST3 system. But what this feature accomplishes is that it separates you from the competition, providing a system whose function far exceeds the normal security control panel, at little to no additional cost.

# Perimeter Doors

## Application

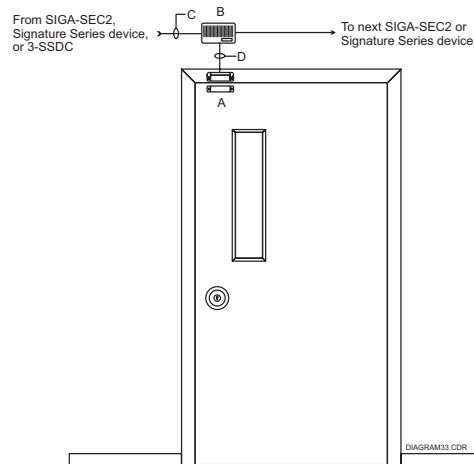
Protecting single entry perimeter doors can vary depending on the door and door construction. The only item that changes with the type of door is the door position switch. There are many types of door position switches for different door applications. This application contains a basic surface-mounted door position switch used for a variety of purposes.

## Entry Door

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	1085T	Magnetic Door Switch	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	

## Diagram



## Sales Tips



The SIGA-SEC2 contains two alarm input zones on each module. Two doors or a zone can be connected to a single SIGA-SEC2.



The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.

# Entry Door with Sounder

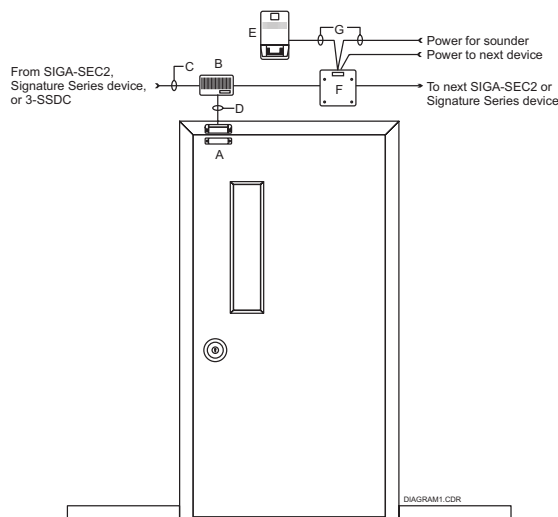
## Application

Protecting single entry perimeter doors can vary depending on the door and door construction. The only item that changes with the type of door is the door position switch. There are many types of door position switches for different door applications. This application contains a basic surface-mounted door position switch used for a variety of purposes. In addition, in this application a local sounder will activate when the door is opened without proper authorization. This is often used in large facilities to prevent unauthorized opening of the door. For example, an emergency door is one application where using a sounder is common.

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	1085T	Magnetic Door Switch	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
E	G1-P	Genesis Horn Steady Tone	EST	1	
F	SIGA-CC1	Signal Module	EST	1	
G	Obtained locally	2 Conductor 18 AWG to 22 AWG	Cable Supplier	Lot	

## Diagram



## Sales Tips



Reduce security sounder cost by using 24 Vdc horns or sounders. This eliminates the need for separate 12 Vdc power supplies.



If a fire evacuation speaker is in close proximity, a special security message can be programmed to sound when the door is open. This would save the cost of the horn, control relay module and the wires for power.



When supplying power for sounder make sure you perform the appropriate voltage calculation to assure the voltage at the device is at the proper level.

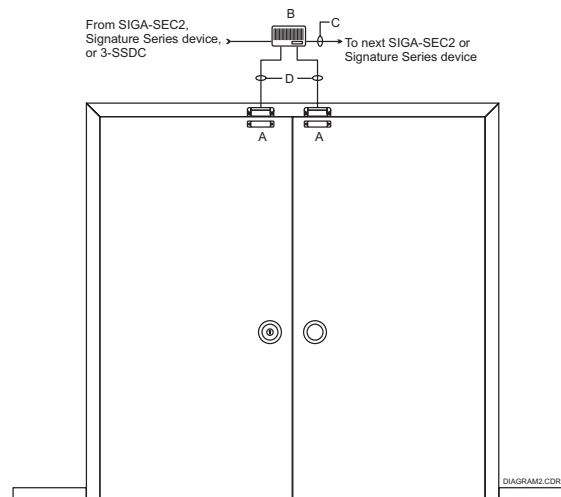
## Double Doors Application

Protecting perimeter double doors can vary depending on the door, door construction and door operation. Typically, only one side of the door will operate with the other side usually locked at the top or at the bottom. You must still protect both doors in case either door is opened. There are many types of door position switches for different door applications. This application uses a common surface-mounted door position switch. Usually both door position switches are wired to report as a single point, not two points.

### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	1085T	Magnetic Door Switches	Sentrol or equivalent	2	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	

### Diagram



### Sales Tips



The SIGA-SEC2 contains two alarm input zones on each module. It is common to connect both door position switches to a single alarm input zone on a SIGA-SEC2.



The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.

### Application

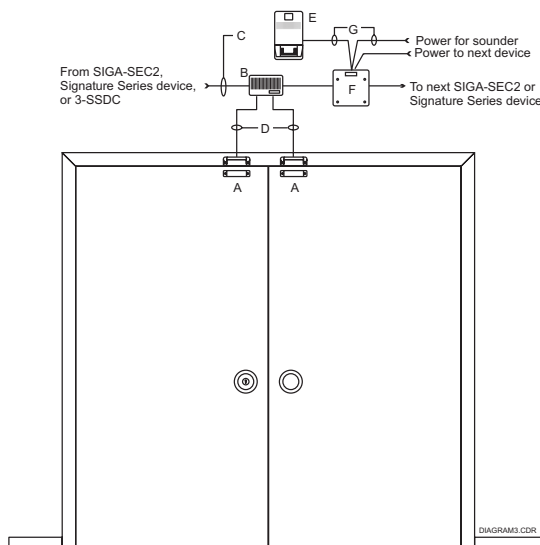
Protecting perimeter double doors can vary depending on the door, door construction and door operation. Typically, only one side of the door will operate with the other side usually locked at the top or at the bottom. You must still protect both doors in case either door is opened. There are many types of door position switches for different door applications. This application uses a common surface-mounted door position switch. Usually both door position switches are wired to report as a single point, not two points. In addition, this application contains a local sounder that activates when the door is opened without proper authorization. This is often used in large facilities to prevent unauthorized opening of the door. For example, an emergency door is one application where using a sounder is common.

## Double Doors with Sounder

### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	1085T	Magnetic Door Switch	Sentrol or equivalent	2	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
E	G1-P	Genesis Horn Steady Tone	EST	1	
F	SIGA-CC1	Signal Module	EST	1	
G	Obtained locally	2 Conductor 18 AWG to 22 AWG	Cable Supplier	Lot	

### Diagram



## Double Doors with Sounder

### Sales Tip



Reduce security sounder cost by using 24 Vdc horns or sounders. This eliminates the need for separate 12 Vdc power supplies.



If a fire evacuation speaker is in close proximity, a special security message can be programmed to sound when the door is open. This would save the cost of the horn, control relay module and the wires for power.



The SIGA-SEC2 contains two alarm input zones on each module. It is common to connect both door position switches to a single alarm input zone on a SIGA-SEC2.



The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.



When supplying power for sounder make sure you perform the appropriate voltage calculation to assure the voltage at the device is at the proper level.



### Application

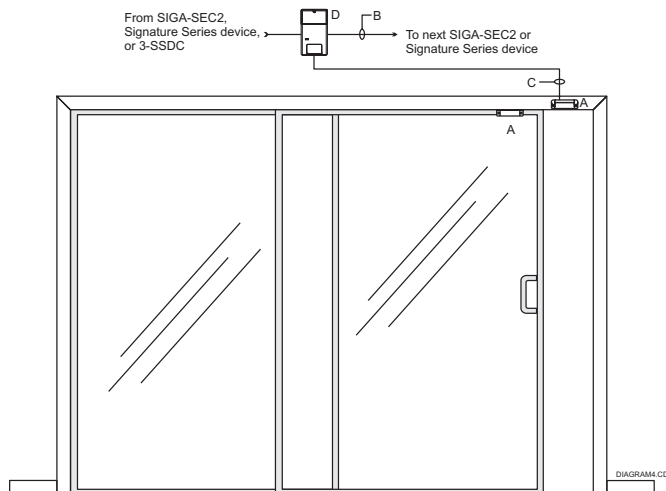
Sliding glass doors are vulnerable to unauthorized entry in two ways. An intruder can open the sliding glass door or they can break the glass on the sliding glass door. It is usually wise to provide a primary means of protection with a secondary means for backup in case one method of unauthorized entry is used over another.

## Sliding Glass Door


### Parts


Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	1085T	Magnetic Door Switch	Sentrol or equivalent	1	
B	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
C	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
D	SIGA-MD	Signature Motion Detector	EST	1	


### Diagram



### Sales Tips

- 

SIGA-MD motion detector provides both PIR motion detection as well as the ability to connect a dry security device contact. This can reduce equipment costs as shown in the application above.
- 

The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.
- 

Two magnets, spaced a few feet apart, can be mounted on the sliding glass door. This will allow a person to open the sliding door for air but maintain the alarm state of the door.

## Overhead Rollup Door

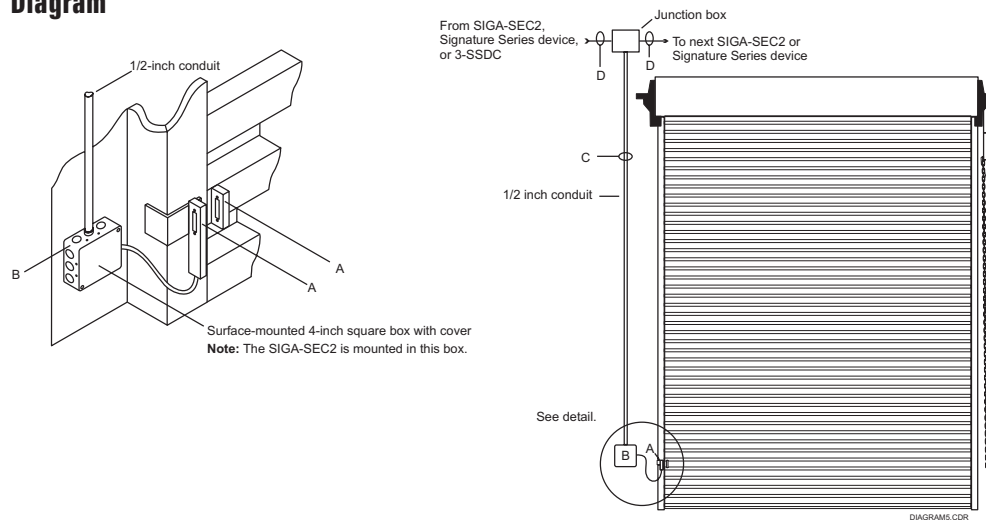
### Application

Overhead doors can be a nuisance to protect since they are subjected to damage and often do not align properly. To protect an overhead rollup door, you must allow for movement within the door, thus providing a switch that allows gap variances that will reduce false alarms or misalignment. This application uses a door position switch that provides the gap variances required for overhead doors. In warehouse environments it is often wise to protect your cables by using conduit at least 10 feet up the wall.


### Parts


Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	2515A	Magnetic Door Switch & Bracket	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	


### Diagram



### Sales Tips

- 

The SIGA-SEC2 contains two alarm input zones on each module. If you have multiple overhead rollup doors, you can secure two doors at a time by installing a single SIGA-SEC2 between them.
- 

The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.
- 

Conduit is used for protecting the wire against damage from machinery.

# Windows and Openings

## Application

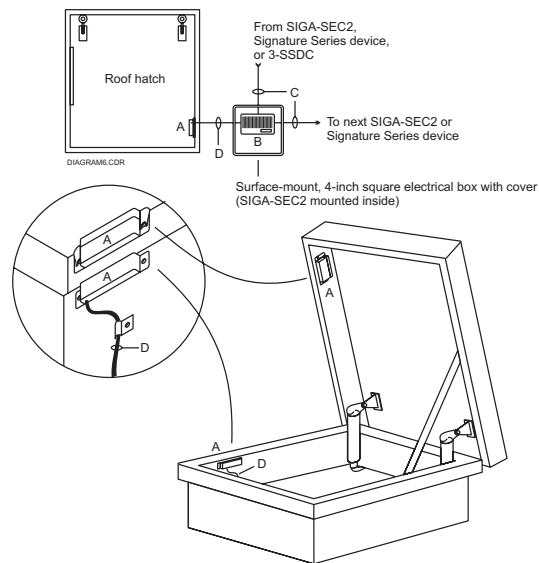
Roof hatches are often overlooked as an entry point into a facility. Providing a door position switch can prevent unauthorized entry from a roof hatch entry point. The use of a properly mounted door position switch will meet this type of application.

## Roof Hatches

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	1085T	Magnetic Door Switch & Bracket	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	

## Diagram



## Sales Tips



The SIGA-SEC2 contains two alarm input zones on each module.



The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.

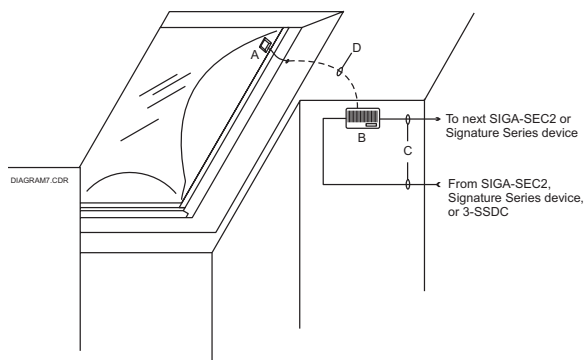
## Sky Lights Application

Skylights can be a vulnerable entry point to many businesses. Often, skylights are made of Plexiglas™, Lexan™ or other types of plastic. This type of construction eliminates the option of using acoustic glass break sensors since these sensors are designed for detecting glass, not plastic. To satisfy this application you should use a shock sensor mounted towards the corner of the skylight.

### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	5725T	Sentrol Shatter Switch shock sensor	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	

### Diagram



### Sales Tips



The SIGA-SEC2 contains two alarm input zones on each module.



The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.

### Application

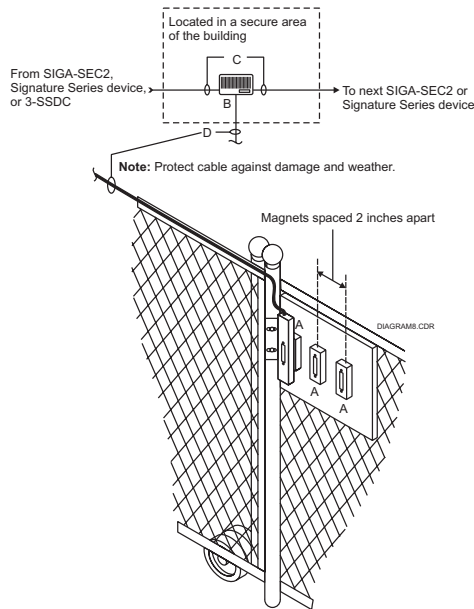
For most chain-link rolling gates, there is considerable tolerance and leeway in the closed position. This makes it difficult to assure proper alignment of the gate switch for alarm protection. Misaligned gates are prone to false alarms so it is often necessary to take the proper measures to reduce the risks of false alarms. This application uses a door position switch that provides the gap variances required to reduce the risk of false alarms.

## Fences (Chain Link Rolling Gates)




### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	2515A	Magnetic Door Switch & Bracket (Need to purchase additional magnets to meet the diagram application.)	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	4 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	

### Diagram



### Sales Tips

-  The SIGA-SEC2 contains two alarm input zones on each module.
-  The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.
-  Do not install the SIGA-SEC2 on the fence or gate. Install the SIGA-SEC2 inside the protected facility.

## Fences (Other Fence Gates)




### Application

Other chain link fence gates can be protected with door position switches and magnets. Depending on the diameter, gatepost and gatepost frame, brackets can be mounted to accommodate the gate structure. Many variables exist with fence construction that make it difficult to assure proper alignment of the gate switch for alarm protection. Misaligned gates are prone to false alarms so it is often necessary to take the proper measures to reduce the risks of false alarms. Because so many scenarios exist for fences and gates, this process can often be labor intensive and difficult to estimate.

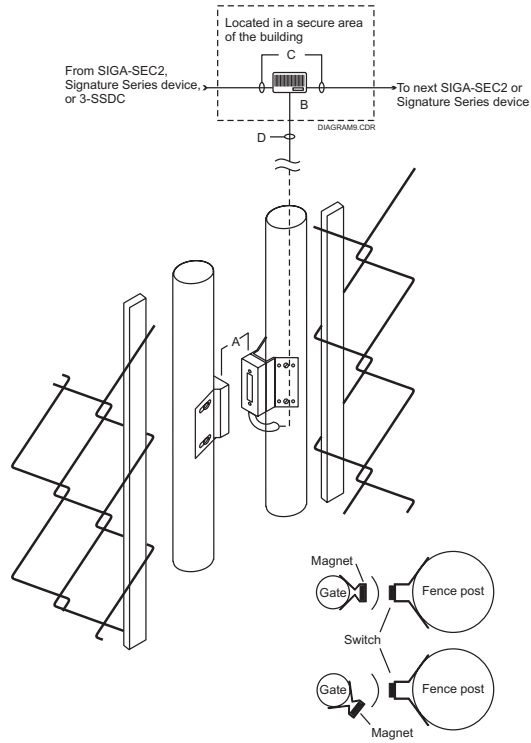
### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	1094A	Magnetic Door Switch & Bracket	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	1	
D	Obtained locally	4 Conductor 16 AWG to 22 AWG	Cable Supplier	1	

### Sales Tips

	The SIGA-SEC2 contains two alarm input zones on each module.
	The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.
	Do not install the SIGA-SEC2 on the fence or gate. Install the SIGA-SEC2 inside the protected facility.

**Diagram**



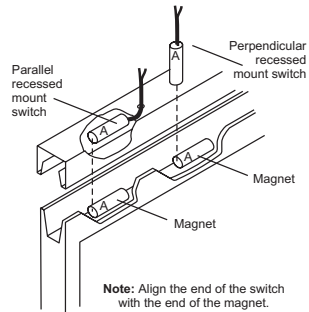
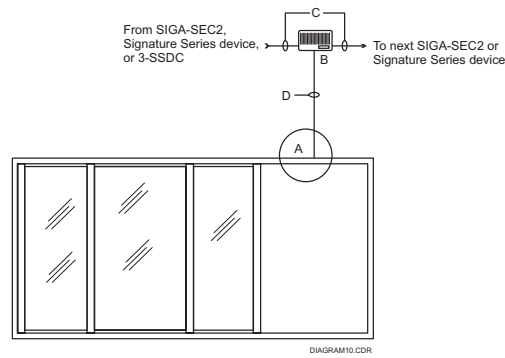
**Fences  
(Other Fence  
Gates)**

# Single Sliding Window

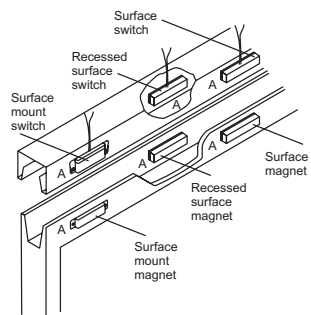
## Application

Protecting single sliding windows can be accomplished by using the same devices as used for doors. A position switch is mounted on the sliding glass window and wired as a single zone. This can be accomplished by using recessed or surface-mounted position switches.

## Diagram



**Recessed Diagram**



**Surface Diagram**



**Parts: Recessed Position Switch**

**Single Sliding Window**

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	1055W	Recessed Position Switch	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	

**Parts: Surface Mount Position Switch**

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	1035W	Surface Mount Position Switch	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	

**Sales Tips**

	The SIGA-SEC2 contains two alarm input zones on each module.
	The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.

## Multiple Windows (motion detectors)

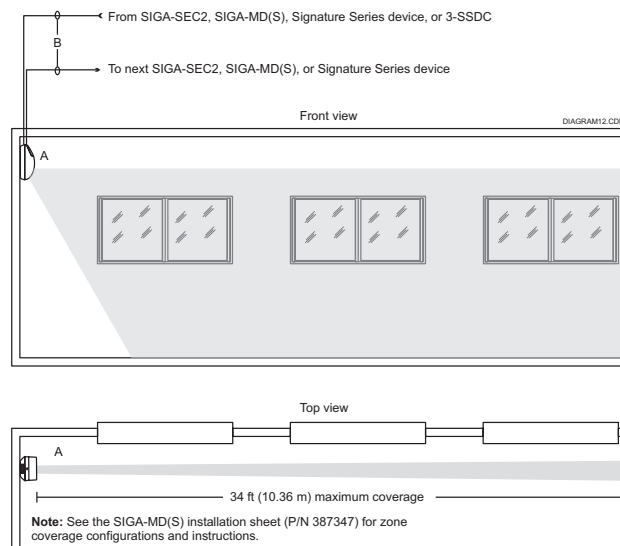
### Application

Protecting multiple windows can be accomplished individually, such as the example used under single sliding windows, or can be made more cost-effective by using a motion detector. Motion detectors often are provided with masks and curtains that modify the field of detection to provide varied alarm patterns. For this application we need an alley pattern of detection that protects from unauthorized entry each of the three windows used in our example.

### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	SIGA-MD	PIR Motion Detector	EST	1	
B	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	

### Diagram



### Sales Tips



The SIGA-MD does not require separate power. The power comes from the Signature loop controller.

### Application

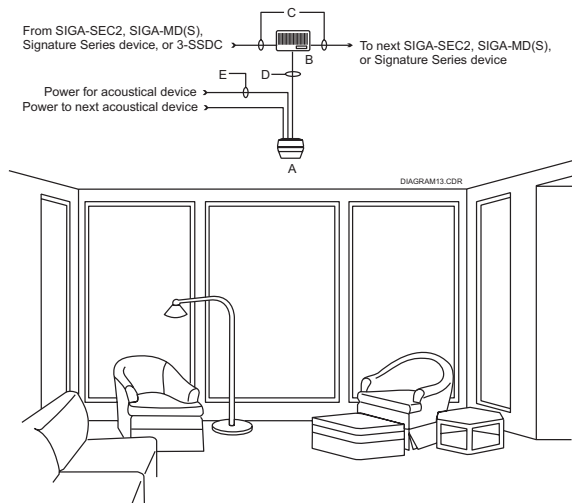
Protecting multiple windows where the windows do not open, or where a single motion detector cannot effectively protect against unauthorized entry, can be accomplished through means of acoustical sensors. Acoustical sensors will hear when the glass is broken within a given area. It is important to match the sensor to the room size. A sensor whose range extends well beyond the boundaries of the room is acoustically "hot" and vulnerable to false alarms. For protecting glass on more than one wall, ceiling mounting is most desirable.

## Multiple Windows (Acoustical sensors)




### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	5810A	Acoustical Sensor, ShatterPro II 25 Ft.	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
E	Obtained locally	2 Conductor 18 AWG to 22 AWG	Cable Supplier	Lot	

### Diagram



### Sales Tips

-  The SIGA-SEC2 contains two alarm input zones on each module.
-  The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.
-  When supplying power for sounder make sure you perform the appropriate voltage calculation to assure the voltage at the device is at the proper level.

# Interior Spaces

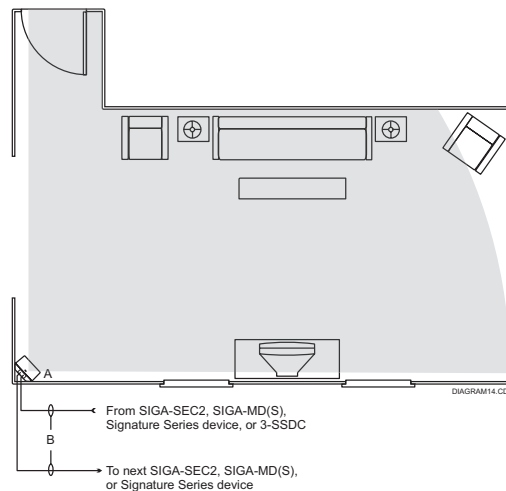
## Office Foyers Application

Large office foyers can be difficult to protect with a single PIR. However, with proper positioning, you can get effective coverage with a single PIR in most cases. This application uses the Signature Series motion detector mounted in the corner between intersecting walls.

### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	SIGA-MD	PIR Motion Detector	EST	1	
B	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	

### Diagram



### Sales Tips



The SIGA-MD does not require separate power. The power comes from the Signature loop controller.



*Passive Infrared Detector application practices:* Passive Infrared Detectors should not be aimed at sources of rapid heating or cooling. These include forced air ducts, space heaters, direct sunlight, strong white lights and mirrors that can reflect strong lights.

### Application

Partitions, half-walls, shelving and filing cabinets are typically encountered in the office environment. The most effective method of protecting all the space in the room is to mount the PIR in the ceiling. Correct positioning of the PIR detector is critical when covering the entire area.

## Offices with Partitions, Shelves & Obstacles

### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	6255	PIR Sureshot Motion Detector	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
E	Obtained locally	2 Conductor 18 AWG to 22 AWG	Cable Supplier	Lot	

### Diagram

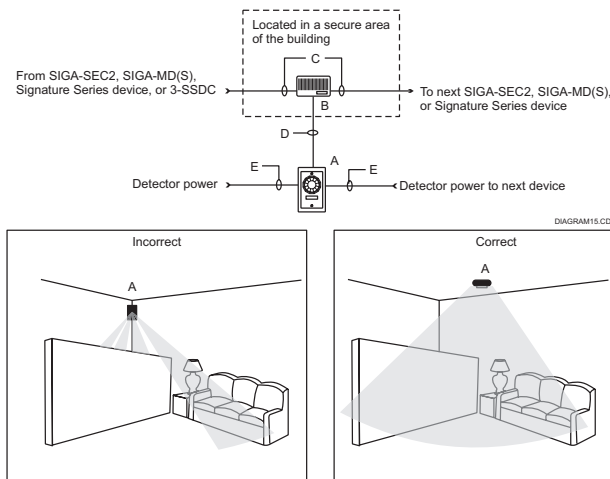






Figure 1: Wall mounted PIRs are more susceptible to blockage by partitions and shelving.

Figure 2: A ceiling mounted PIR can provide protection from partitions blocking the view.

### Sales Tips

-  The SIGA-SEC2 contains two alarm input zones on each module.
-  The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.
-  *Passive Infrared Detector application practices:* Passive Infrared Detectors should not be aimed at sources of rapid heating or cooling. These include forced air ducts, space heaters, direct sunlight, strong white lights and mirrors that can reflect strong lights.
-  When supplying power for sounder make sure you perform the appropriate voltage calculation to assure the voltage at the device is at the proper level.

# Loading Dock Doors

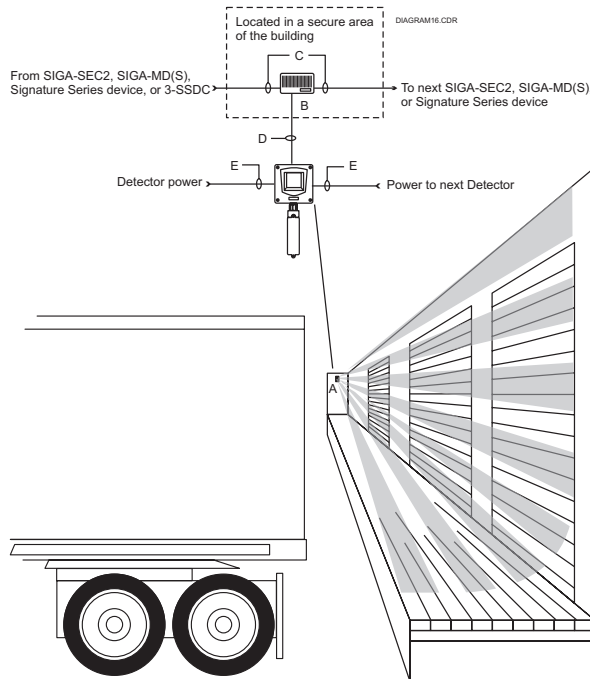
## Application

Loading dock doors are frequently the target of intruders. Early detection can prevent costly break-ins to truck trailers and to the warehouse itself. For this application it is wise to use a PIR that is made for the outdoor environment.

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	6187CTX	Outdoor PIR Motion Detector	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
E	Obtained locally	2 Conductor 18 AWG to 22 AWG	Cable Supplier	Lot	

## Diagram



## Sales Tips



The SIGA-SEC2 contains two alarm input zones on each module.



The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.



When supplying power for sounder make sure you perform the appropriate voltage calculation to assure the voltage at the device is at the proper level.

### Application

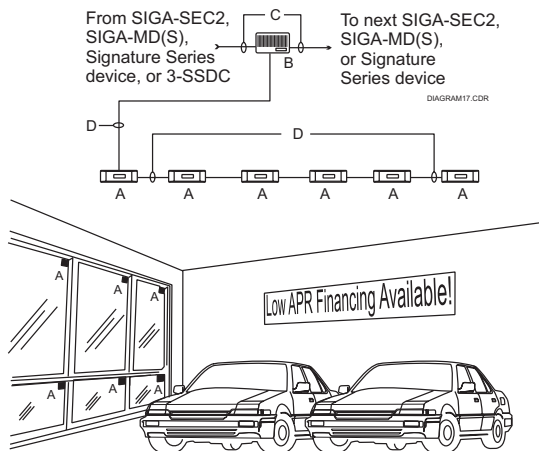
Storeowners often want glass-break protection on their front windows in order to have the alarm sound as soon as the glass is broken. While this does not prevent “smash and grab” losses, in most cases it will prevent burglars from actually entering the premises. For storefront windows, shock sensors are always the best choice. A shock sensor is visible from the outside, which might deter burglars before the glass is broken. Shock sensors are less likely to be set off by street noise or by rolling metal shutters than are acoustical sensors.

## Store Fronts (Shock Sensors)




### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	5415A	Shock sensor (Self- powered)	Sentrol or equivalent	6	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	

### Diagram



### Sales Tips

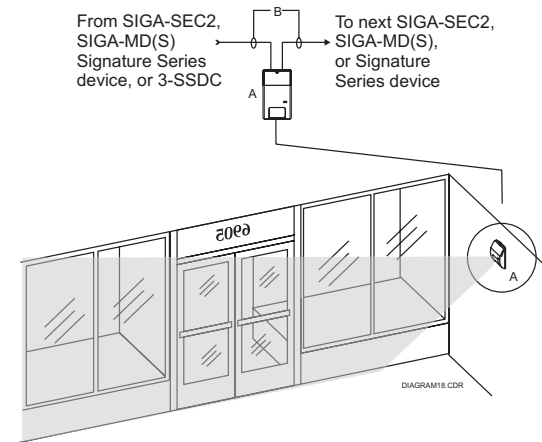
-  The SIGA-SEC2 contains two alarm input zones on each module.
-  The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.
-  The Sentrol 5415A does not require separate power. The power comes from a battery integral to the shock sensor. Sentrol also offers the 5425 which does require separate power.

## Store Fronts (Motion Detection)

### Application

Curtain PIR motion detectors provide an alternate method for protecting large windows and doors that are typically found in a storefront application. In many cases, the PIR motion detector provides a better cost-effective solution than multiple glass break detectors.

### Diagram



### Application Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	SIGA-MD	PIR Motion Detector	EST	1	
B	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	

### Sales Tips



The SIGA-MD contains masks and curtains that modify the field of detection to provide varied alarm patterns. These provide greater flexibility for a single detector.



## Application

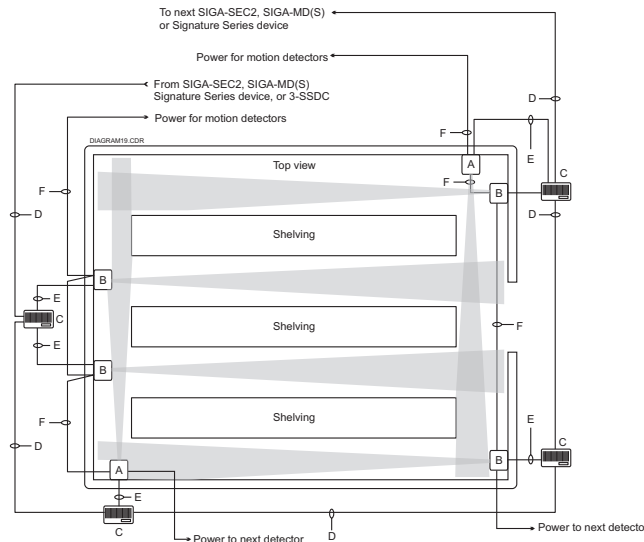
Many types of facilities such as warehouses, distribution centers, home improvement centers, etc., have areas where long aisles of shelving are a concern. The best approach is to protect the aisles with a combination of long and short-range motion detectors.

## Shelving

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	AP425/426	PIR Motion Detector 50' by 60' foot pattern with mirror masks	Sentrol or equivalent	2	
B	PR633/643	PIR Motion Detector 80' by 200' pattern with mirror masks	Sentrol or equivalent	4	
C	SIGA-SEC2	Dual Input Security Module	EST	4	
D	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
E	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
F	Obtained locally	2 Conductor 18 AWG to 22 AWG	Cable Supplier	Lot	

## Diagram



## Sales Tips



The SIGA-SEC2 contains two alarm input zones on each module.



The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.



Motion detectors can be powered by a central power supply or by a local transformer. It is usually better to power motion detectors from a central power supply. To provide local power for transformers, it may be necessary to have an electrician install 120 Vac power outlets where needed, increasing your project cost. Central power supplies can include battery backup, helping reduce false alarms due to power fluctuations.



When supplying power for sounder make sure you perform the appropriate voltage calculation to assure the voltage at the device is at the proper level.

# Supervisory Functions

## Temperature Monitoring

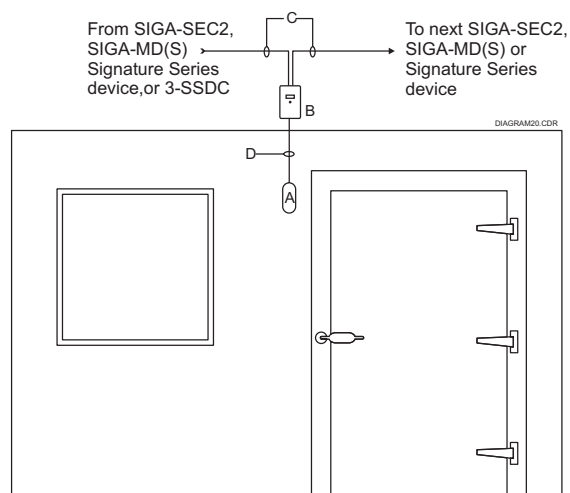
### Application

In facilities such as cold storage warehouses, department store fur vaults, and grocery refrigerated storage units, there is often a need to monitor refrigerant equipment to assure its continued operation. Temperature sensors are commonly used to monitor high or low temperature settings. Usually the temperature device is monitored at a remote monitoring facility such as a Central Station. If activated, the Central Station will notify personnel of the abnormal condition so that the problem can be corrected. Refrigerated areas store food or other items that are worth thousands of dollars and that could be destroyed if the proper temperature is not maintained.

### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	UTA1	Micro Temp Alert Sensor 1 - 99 minutes, 32 to 300 degree Fahrenheit	Windland	1	
B	SIGA-CT1	Supervisory Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 18 AWG to 22 AWG	Cable Supplier	Lot	

### Diagram



### Sales Tips



Using the MODCOM dialer in an EST3 cabinet will generate digital communication signals that can be monitored by a Central Station.

**Application**

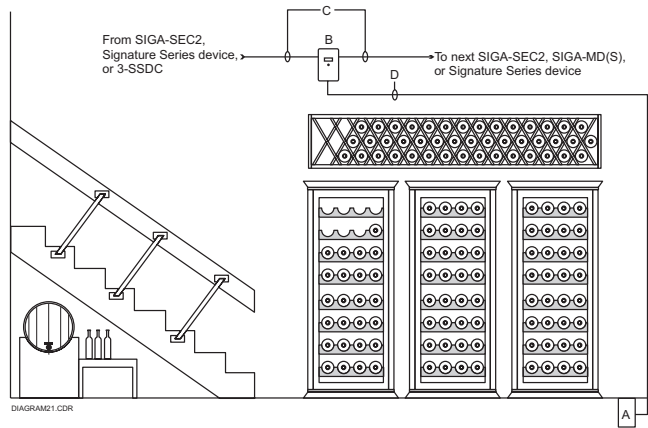
The flooding of cellars or basements can cause extensive damage. To avoid costly repairs, a device known as a sump pump is often used to keep water from building up in these areas. Usually the sump pump is monitored at a remote monitoring facility such as a Central Station. If activated, the Central Station will notify personnel of the abnormal condition so that the problem can be corrected.

**Sump Pumps**


**Parts**

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CS2029W	Sump Pump	Cellar Saver	1	
B	SIGA-CT1	Supervisory Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	1	
D	Obtained locally	2 Conductor 18 AWG to 22 AWG	Cable Supplier	1	

**Diagram**



**Sales Tips**



Using the MODCOM dialer in an EST3 cabinet will generate digital communication signals that can be monitored by a Central Station.

# Duress

## Cash Registers

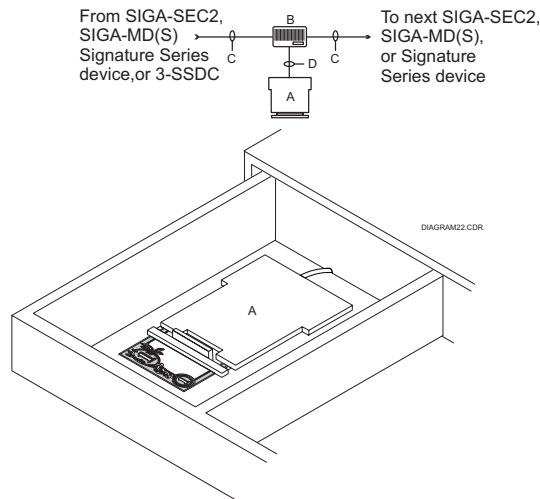
### Application

You can alert authorities to unauthorized removal of money from cash register drawers with a device known as a money trap. This device holds paper currency between a magnetized clip and back plate that contains magnetic reed contacts. Mounted in a drawer, the money trap will activate an alarm event when the money is removed from the money trap.




### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	3555	Money Trap	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG Stranded	Cable Supplier	Lot	

### Diagram



### Sales Tips

-  The SIGA-SEC2 contains two alarm input zones on each module.
-  The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.
-  Money traps can cause nuisance alarms if not properly installed. It is recommended that stranded cable be used between the money trap and the SIGA-SEC2 module. Constant drawer movement will cause solid wires to break.

### Application

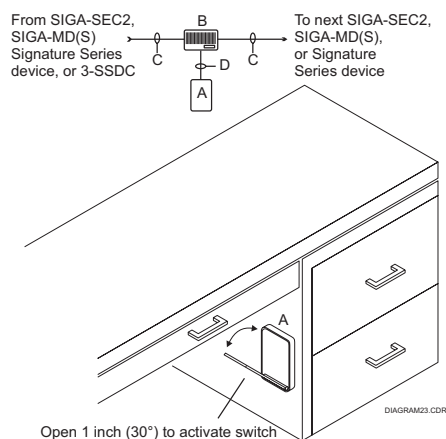
Banks, jewellery stores, fast food restaurants, convenience stores and other places where people and property are at risk can be protected with a manually-operated silent panic/emergency alarm switch. If threatened, an individual can activate the switch, initiating an alarm event. The event is transmitted to the central station and the police department is contacted.

## Silent Panic and Emergency Alarm



### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	3045	Silent Alarm Device	Sentrol or equivalent	1	
B	SIGA-SEC2	Dual Input Security Module	EST	1	
C	Obtained locally	2 Conductor 18 AWG (Twisted Shield Not Required)	Cable Supplier	Lot	
D	Obtained locally	2 Conductor 16 AWG to 22 AWG Stranded	Cable Supplier	Lot	

### Diagram



### Sales Tips

-  The SIGA-SEC2 contains two alarm input zones on each module.
-  The SIGA-SEC2 can be connected to any security device that contains alarm contacts such as motion detectors, glass break detectors or photoelectric beams.



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# Access Control

Access control is a service that provides three primary functions: 1) Controls entry to / exit from an area or facility, 2) Tracks and logs personnel throughout a facility and 3) Eliminates key and lock cylinder replacement costs when employees are hired or terminated.

There are many detail items to consider when providing electronic access through a door entry. What does the local code for egress require? Is the door a UL fire-rated door that requires a certain kind of locking device and method of installation? Is the door an emergency exit door that may have to meet specific local code requirements? Is the door installed properly? Do we need to add door closers? Can I get wires to the door lock? If this is a glass entry door, how do I install the locks? And the list goes on. These are just a few of the questions that need to be asked before you can properly provide an estimate to your customer. It is advisable to partner with a professional lock company who has experience with the intricacies of door and lock installations. This usually lowers your price to the customer and reduces your risk for the project.

The access control market is evolving. Technology has driven many of the components that are commonly used in access control systems into a commodity market. Products such as readers, door switches, request-to-exit devices and locks can be accessed through many channels of distribution and are generally price point driven. The items that usually remain proprietary to a particular manufacturer are the reader controller and the software that monitors and manages the access control system. With the shift towards commodity products, some standards for interfacing these products have emerged: standards for dry-contact connection for devices like door monitor switches, request-to-exit devices and locks. Readers often carry a Wiegand standard (usually 26 bit) for interfacing into a reader controller. This shift towards commodity products has created a lower price point for purchasing access control systems. As the access control market evolves, price points for purchasing access control systems has fallen, creating greater opportunity.

Synergy's price point for an access control door is one of the lowest in the industry when an EST3 system is already installed within the facility. Using the 3-SAC module, connecting card reader controllers to an EST3 panel leverages the existing data communication backbone that exists with the fire alarm system. If the application calls for stand-alone access control, the Synergy-enabled architecture provides many configuration options that assist you in providing creative and competitive solutions to your customers. Synergy solutions are competitive with the industry's leading manufacturers.

The following section contains some basic door configurations that you will come across when providing access control solutions to your customers. The applications within the section are intended to provide you with some basic knowledge and common solutions for your proposals. Please remember that there are several methods to use when providing a solution to your customers, so even though we may show one method, you should always explore alternative solutions, remaining inventive and competitive.

To help you better understand the terminology tossed around when discussing access control systems, some common terms are explained below.

**Reader**

A device that reads the encoded badge number when a badge is presented. Technologies include mag-strip, proximity, Wiegand, bar code, biometric, etc.

**Request to Exit Device**

A device that is installed on the egress side of the door to allow free egress when activated. Common request-to-exit devices include PIR motion detectors, push buttons and touch sensitive bars.

**CRC**

A Card Reader Controller that controls a door application. A CRC provides the electronic interface for reader(s), request-to-exit devices, door position switches, intelligent database for the door and activation of the lock(s).

**Door Position Switches**

Switches that monitor the status of a door or window's position.

**Strikes**

Locking devices that are installed on the doorframe where the doorknob meets the doorframe.

**Magnetic Locks**

Locks that use electric magnets to hold a door closed when power is applied. The locks come in many configurations and vary in door holding force.

**3-SAC**

This is the Security Access Control module that is installed in the EST3 cabinet. Up to 62 CRC controllers and/or Keypad Displays can be installed on a single module.

**KPDISP**

A Keypad Display that is commonly used for security functions such as arming or disarming a security partition / zone, bypassing alarm points, extending closing times, etc.



# Doors

## Application

Protecting facilities from unauthorized entry is a common reason for providing access control at main entry points within a facility. The most common access control door configuration is provided below. In this example, the door can be opened with an authorized credential. Exiting the facility involves activating a PIR motion detector that will unlock the door when a person enters into close proximity to the door. If a person leaves the door open, the door position switch will indicate a door ajar condition, generating an alarm event. During normal door operation, the door position switch is “shunted” from activating an alarm. Power for the lock and CRC is from an approved 24 Vdc power source located at some other location.

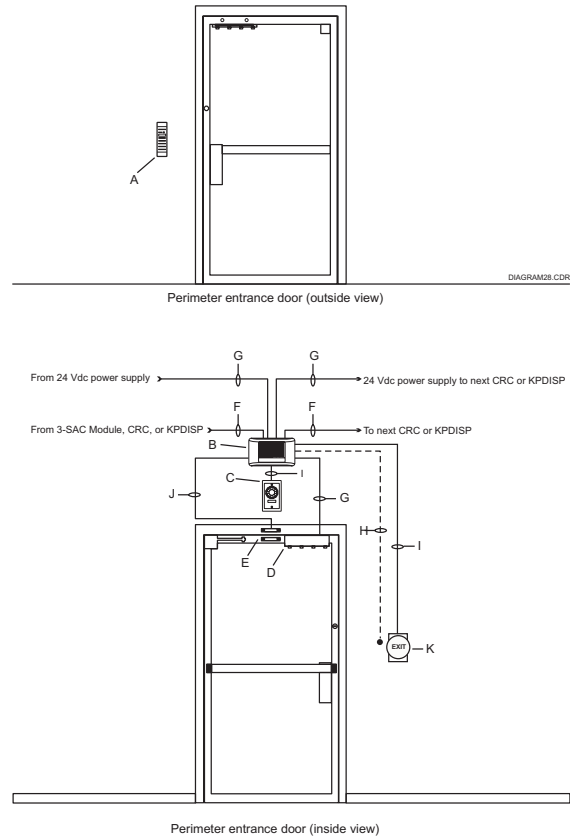
## Non-Emergency Exit/Entry Door (Single Reader)

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	1	
B	CRC or CRCXM	Card Reader Controller	EST	1	
C	6255	Passive Infrared Detector	Sentrol or equivalent	1	
D	M62F	Magnetic Lock with 1200 lb holding force, 12 or 24 Vdc	Securitron	1	
E	1085T	Magnetic Door Switch	Sentrol or equivalent	1	
F	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
G	Obtained locally	2 Conductor Twisted 14 or 16 AWG for CRC power and lock power	Cable Supplier	Lot	
H	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	
I	Obtained locally	4 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
J	Obtained locally	2 Conductor 16 to 22 AWG	Cable Supplier	Lot	
K	EEB2N	Request to Exit Button with Timer	Securitron	1	

# Non-Emergency Exit/Entry Door (Single Reader)

## Diagram



## Sales Tips



“Door Ajar” is sometimes sold as an extra feature.



Using common power supplies for the CRC and the locks reduces project costs.



CRC communications can be configured using Class A or Class B wiring.



A request-to-exit button can be used instead of a PIR motion detector.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.

## Application

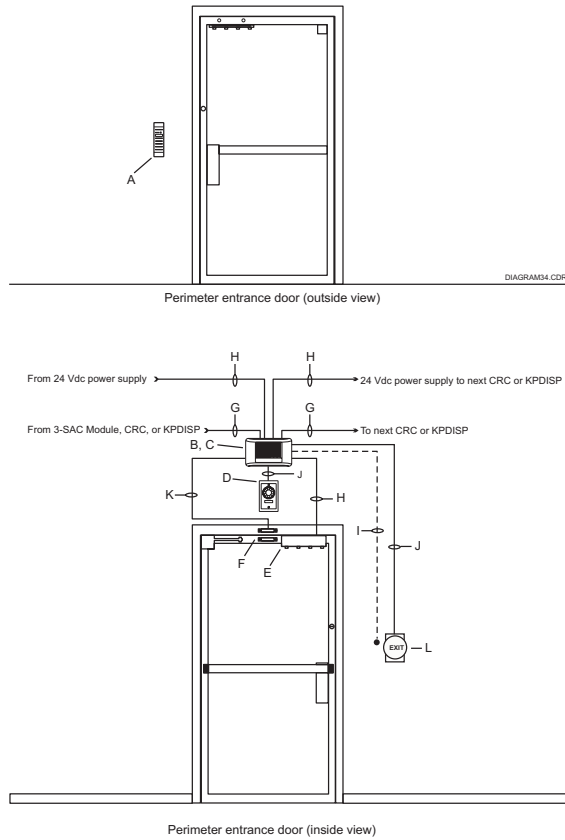
Protecting facilities from unauthorized entry is a common reason for providing access control at main entry points within a facility. The most common access control door configuration is provided below. In this configuration the door is also used as an emergency exit. In this example, the door can be opened with an authorized credential. Exiting the facility involves activating a PIR motion detector that will unlock the door when a person enters into close proximity to the door. If a person leaves the door open, the door position switch will indicate a door ajar condition, generating an alarm event. During normal door operation, the door position switch is "shunted" from activating an alarm. Power for the lock and CRC is from an approved 24 Vdc power source located at some other location. A CRCRL relay is used for the 24 Vdc magnetic locks with current or voltage outside the CRC specification.

## Emergency Exit/Entry Door (Single Reader)

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	1	
B	CRC or CRCXM	Card Reader Controller	EST	1	
C	CRCRL	Relay used for strike or magnetic locks	EST	1	
D	6255	Passive Infrared Detector	Sentrol or equivalent	1	
E	370 Series	Magnetic Lock with 1500 lb holding force, 12 or 24 Vdc	Locknetics	1	
F	1085T	Magnetic Door Switch	Sentrol or equivalent	1	
G	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
H	Obtained locally	2 Conductor Twisted 14 or 16 AWG for CRC power and lock power	Cable Supplier	Lot	
I	Obtained locally	8 Conductor stranded 22AWG with overall shield	Cable Supplier	Lot	
J	Obtained locally	4 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
K	Obtained locally	2 Conductor 16 to 22 AWG	Cable Supplier	Lot	
L	EEB2N	Request to Exit Button with Timer	Securitron	1	

# Emergency Exit/Entry Door (Single Reader) Diagram



## Sales Tips



“Door Ajar” is sometimes sold as an extra feature.



Using common power supplies for the CRC and the locks reduces project costs.



CRC communications can be configured using Class A or Class B wiring.



A request-to-exit button can be used instead of a PIR motion detector.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.

## Application

Sometimes the operation of a facility warrants the tracking of personnel to and from an area. Providing this function requires the use of an entry reader and an exit reader. In this example, whether you are entering or exiting the area, you are required to present a valid credential. This enables the system to track when and where a person enters or exits a facility, and who it is. If a person leaves the door open, the door position switch will indicate a door ajar condition, generating an alarm event. During normal door operation, the door position switch is “shunted” from activating an alarm. Power for the lock and CRC is from an approved 24 Vdc power source located at another location. A CRCRL relay is used for the 24 Vdc magnetic lock with current or voltage outside the CRC specification.

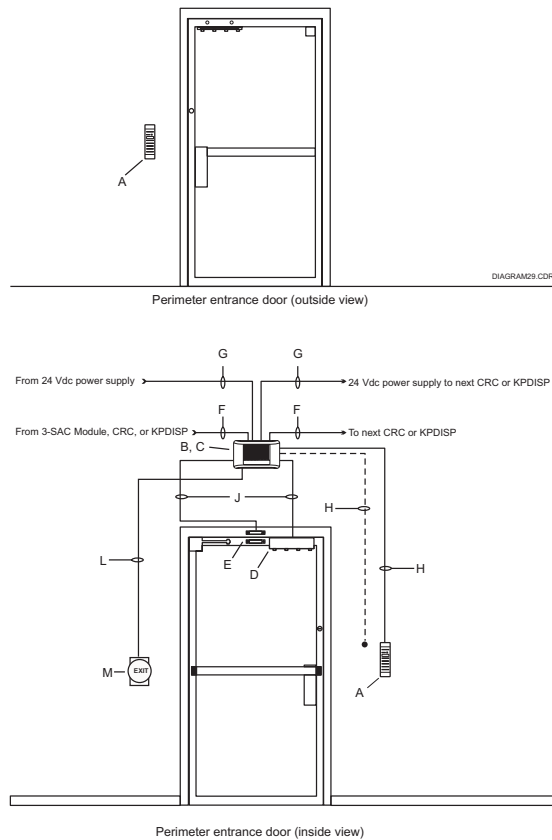
## Non-Emergency Exit/Entry Door (In / Out Reader)

## Parts


Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	2	
B	CRC or CRCXM	Card Reader Controller	EST	1	
C	CRCRL	Relay used for strike or magnetic locks	EST	1	
D	370 Series	Magnetic Lock with 1500 lb holding force, 12 or 24 Vdc	Locknetics	1	
E	1085T	Magnetic Door Switch	Sentrol or equivalent	1	
F	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
G	Obtained locally	2 Conductor Twisted 14 or 16 AWG for CRC power and lock power	Cable Supplier	Lot	
H	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	
J	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
M	EEB2N	Request to Exit Button with Timer	Securitron	1	
L	Obtained locally	4 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	


# Non-Emergency Exit/Entry Door (In / Out Reader)


## Diagram





## Sales Tips

- 

“Door Ajar” is sometimes sold as an extra feature.
- 

Using common power supplies for the CRC and the locks reduces project costs.
- 

CRC communications can be configured using Class A or Class B wiring.
- 

A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.
- 

When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.

## Application

Protecting facilities from unauthorized entry is a common reason for providing access control at main entry points within a facility. Entry points with double doors need to have locking hardware for both doors, but in most applications only one door is used for the actual entry and exiting of an area. In this example, the door can be opened with an authorized credential. Exiting from the facility involves the activation of a PIR motion detector that will unlock the door when a person enters into close proximity to the door. If a person leaves the door open, the door position switch will indicate a door ajar condition, generating an alarm event. During normal door operation, the door position switch is “shunted” from activating an alarm. Power for the lock and CRC is from an approved 24 Vdc power source located at another location. A CRCRL relay is used for the 24 Vdc magnetic lock with current or voltage outside the CRC specification.

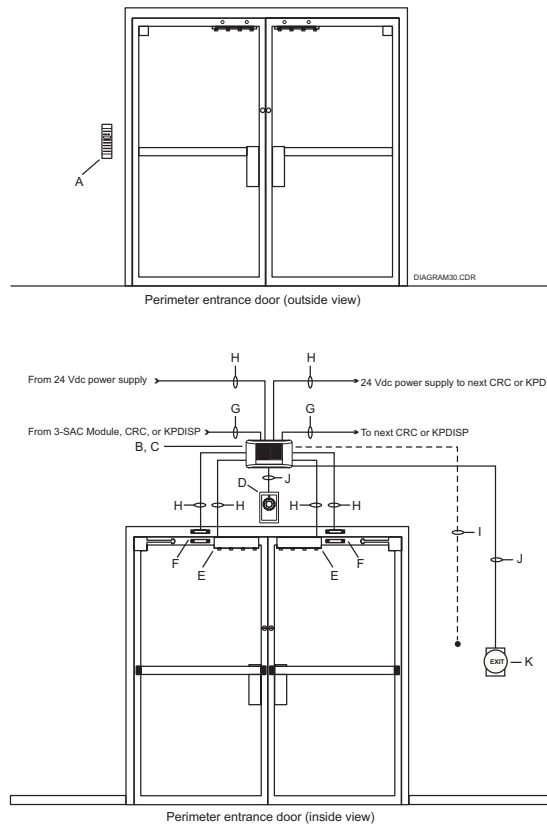
## Non-Emergency Exit Double Door (Single Reader)

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	1	
B	CRC or CRCXM	Card Reader Controller	EST	1	
C	CRCRL	Relay used for strike or magnetic locks	EST	1	
D	6255	Passive Infrared Detector	Sentrol or equivalent	1	
E	370 Series	Magnetic Lock with 1500 lb holding force, 12 or 24 Vdc	Locknetics	2	
F	1085T	Magnetic Door Switch	Sentrol or equivalent	2	
G	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
H	Obtained locally	2 Conductor Twisted 14 or 16 AWG for CRC power and lock power	Cable Supplier	Lot	
I	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	
J	Obtained locally	4 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
K	EEB2N	Request to Exit Button with Timer	Securitron	1	

# Non-Emergency Exit Double Door (Single Reader)

## Diagram



## Sales Tips



“Door Ajar” is sometimes sold as an extra feature.



Using common power supplies for the CRC and the locks reduces project costs.



CRC communications can be configured using Class A or Class B wiring.



A request-to-exit button can be used instead of a PIR motion detector.



Sometimes due to budget restraints the lock is eliminated from the door that is not used for entry. This is usually acceptable if there is a secure method to manually latch the door from the top and from the bottom.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.



## Application

Protecting facilities from unauthorized entry is a common reason for providing access control at main entry points within a facility. Entry points with double doors need to have locking hardware for both doors, but in most applications only one door is used for the actual entry and exiting of an area. In this configuration the door is also used as an emergency exit. The door can be opened with an authorized credential. Exiting from the facility involves the activation of a PIR motion detector that will unlock the door when a person enters into close proximity to the door. If a person leaves the door open, the door position switch will indicate a door ajar condition, generating an alarm event. During normal door operation, the door position switch is “shunted” from activating an alarm. Power for the lock and CRC is from an approved 24 Vdc power source located at another location. A CRCRL relay is used for the 24 Vdc magnetic lock with current or voltage outside the CRC specification.

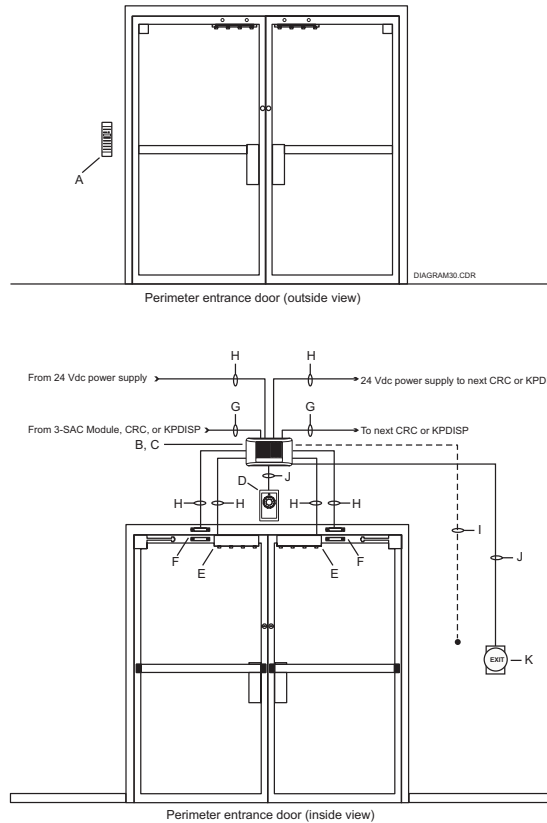
## Emergency Exit Double Door (Single Reader)

## Parts








Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	1	
B	CRC or CRCXM	Card Reader Controller	EST	1	
C	CRCRL	Relay used for strike or magnetic locks	EST	1	
D	6255	Passive Infrared Detector	Sentrol or equivalent	1	
E	370 Series	Magnetic Lock with 1500 lb holding force, 12 or 24 Vdc	Locknetics	2	
F	1085T	Magnetic Door Switch	Sentrol or equivalent	2	
G	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
H	Obtained locally	2 Conductor Twisted 14 or 16 AWG for CRC power and lock power	Cable Supplier	Lot	
I	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	
J	Obtained locally	4 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
K	EEB2N	Request to Exit Button with Timer	Securitron	1	

# Emergency Exit Double Door (Single Reader)

## Diagram



## Sales Tips

-  "Door Ajar" is sometimes sold as an extra feature.
-  Using common power supplies for the CRC and the locks reduces project costs.
-  CRC communications can be configured using Class A or Class B wiring.
-  A request-to-exit button can be used instead of a PIR motion detector.
-  Sometimes due to budget restraints the lock is eliminated from the door that is not used for entry. This is usually acceptable if there is a secure method to manually latch the door from the top and from the bottom.
-  A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.
-  When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.

## Application

Sometimes the operation of a facility warrants the tracking of personnel to and from an area. Providing this function requires the use of an entry reader and an exit reader. Entry points with double doors need to have locking hardware for both doors, but in most applications only one door is used for the actual entry and exiting of an area. In this example, whether you are entering or exiting the area, you are required to present a valid credential. This enables the system to track when and where a person enters or exits a facility, and who it is. If a person leaves the door open, the door position switch will indicate a door ajar condition, generating an alarm event. During normal door operation, the door position switch is “shunted” from activating an alarm. Power for the lock and CRC is from an approved 24 Vdc power source located at another location. A CRCRL relay is used for the 24 Vdc magnetic lock with current or voltage outside the CRC specification.

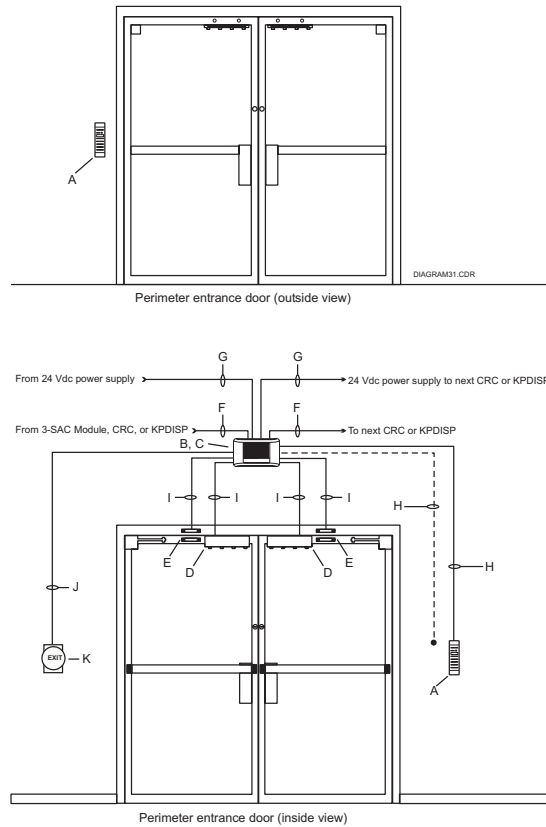
## Non-Emergency Exit Double Door (In / Out Reader)

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	2	
B	CRC or CRCXM	Card Reader Controller	EST	1	
C	CRCRL	Relay used for strike or magnetic locks	EST	1	
D	370 Series	Magnetic Lock with 1500 lb holding force, 12 or 24 Vdc	Locknetics	2	
E	1085T	Magnetic Door Switch	Sentrol or equivalent	2	
F	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
G	Obtained locally	2 Conductor Twisted 14 or 16 AWG for CRC power and lock power	Cable Supplier	Lot	
H	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	
I	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
J	Obtained locally	4 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
K	EEB2N	Request to Exit Button with Timer	Securitron	1	

# Non-Emergency Exit Double Door (In / Out Reader)

Diagram



## Sales Tips



“Door Ajar” is sometimes sold as an extra feature.



Using common power supplies for the CRC and the locks reduces project costs.



CRC communications can be configured using Class A or Class B wiring.



Sometimes due to budget restraints the lock is eliminated from the door that is not used for entry. This is usually acceptable if there is a secure method to manually latch the door from the top and from the bottom.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.

## Application

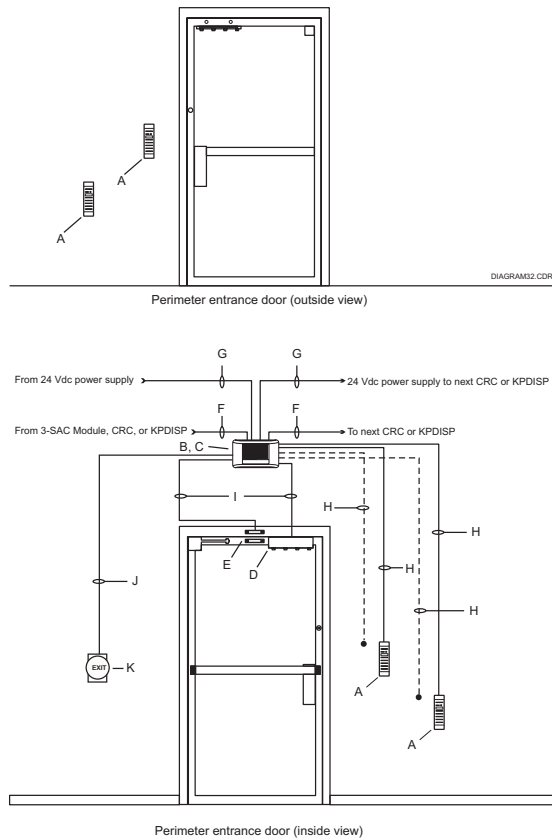
A handicap access door provides an automatic door opener that enables a handicapped person to enter and exit and also allows extra access time. The door can function for both normal access and handicap access. A person without handicap privileges would operate the door just as any other door. When a person with handicap privileges badges in, the Card Reader Controller recognizes that the person has handicap privileges and provides two extra benefits. The first is giving the handicap person extra time to enter or exit the doorway before relocking the door. The second is an automatic door opener. A second card reader can be installed in parallel to the entry or exit card reader to make it easier for a handicapped person to reach. The second card reader should be placed at a lower level and farther away from the door. The distance from the door should allow the automatic door to open fully without a person needing to move backwards. Egress is performed using a request-to-exit device, such as a motion detector shown for this application.

## Handicap Door

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	2	
B	CRC or CRCXM	Card Reader Controller	EST	1	
C	CRCRL	Relay used for strike or magnetic locks	EST	1	
D	370 Series	Magnetic Lock with 1500 lb holding force, 12 or 24 Vdc	Locknetics	1	
E	1085T	Magnetic Door Switch	Sentrol or equivalent	1	
F	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
G	Obtained locally	2 Conductor Twisted 14 or 16 AWG for CRC power and lock power	Cable Supplier	Lot	
H	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	
I	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
J	Obtained locally	4 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
K	EEB2N	Request to Exit Button with Timer	Securitron	1	

# Handicap Door Diagram



## Sales Tips



Refer to the appropriate ADA codes and the local AHJ to determine the requirements for handicap access door applications.



CRC communications can be configured using Class A or Class B wiring.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.

# Facility Ingress/Egress

## Application

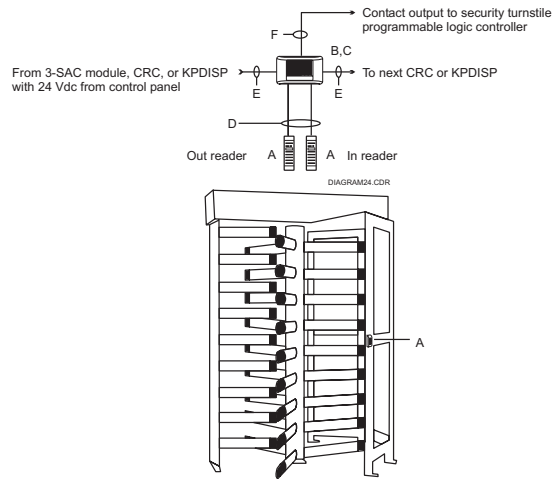
Security turnstiles are often used in situations where you may need to control employee entry from the exterior of the facility. Examples include refineries, building lobbies, large construction sites, etc. Security turnstiles serve not only as a physical barrier, but also as a means to restrict entry to one person at a time. Turnstiles can be configured to operate in various ways. The two most common are: 1) Free turning in one direction, locked in the opposite direction, 2) Controlled in both directions. This application uses two readers that will permit control in both directions. Security turnstiles are usually configured to be "Self-Contained". This means that the security turnstile has all the electronics and locking mechanisms built in to lock and release the security turnstile. The only interface that the security turnstile requires is a contact closure from the CRC indicating authorization to enter or exit provided by the CRCRL. Check specific interface requirements from the turnstile manufacturer.

## Turnstile

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	2	
B	CRC or CRCXM	Card Reader Controller	EST	1	
C	CRCRL	Relay used for turnstile interface	EST	1	
D	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	
E	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
F	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	

## Turnstile Diagram



### Sales Tips



Use caution when proposing security turnstiles. There are many construction items involved when installing a security turnstile. These include items such as turnstile pad (concrete) for mounting, electrical hookup, fence or wall alignment, etc.



CRC communications can be configured using Class A or Class B wiring.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.



## Application

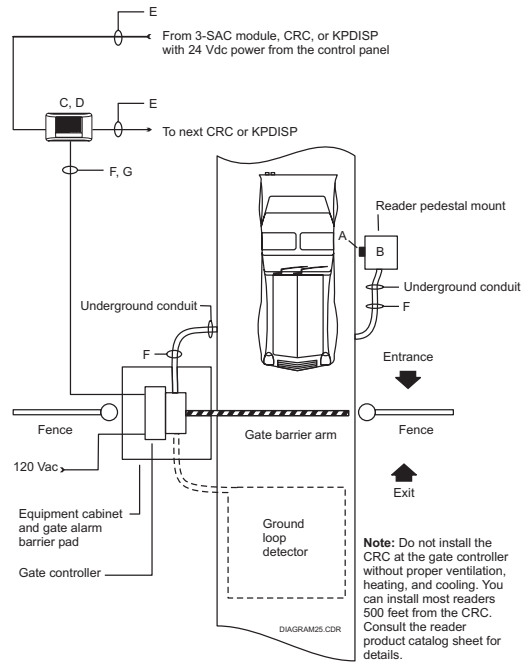
Parking lots are often controlled and managed by the use of parking gate barriers. For employee applications, most parking lots use a reader to allow entry into the parking lot and use ground loop detectors for free egress. Most parking gate barriers are usually configured to be “Self-Contained”. This means that the parking gate barrier has all the electronics and locking mechanisms built in to raise and lower the barrier arm. The only interface that the parking gate barrier requires is a contact closure from the CRCRL indicating authorization to enter. Check specific interface requirements from the parking gate barrier manufacturer.

## Parking Lot Single Reader


## Parts


Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	5375	MaxiProx Reader	HID	1	
B	Custom	Pedestal Reader Mount	Custom	1	
C	CRC or CRCXM	Card Reader Controller	EST	1	
D	CRCRL	Relay used for parking gate barrier interface	EST	1	
E	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
F	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	
G	Obtained locally	6 Conductor 18 to 20 AWG	Cable Supplier	Lot	


# Parking Lot Single Reader Diagram





## Sales Tips

- 

Use caution when proposing parking gate barriers. It is usually wiser to contract the installation and procurement of the parking gate barrier, the barrier pad, electrical work, reader pedestal, parking lot cutting, parking lot repair and fence alignment.
- 

Sometimes a guard station is located beside the barrier gate. If the guard station requires manual release of the parking gate arm, add a request-to-exit button at the guard station and connect the request-to-exit button into the CRC for the parking gate barrier reader.
- 

CRC communications can be configured using Class A or Class B wiring.
- 

A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.
- 

When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.

## Application

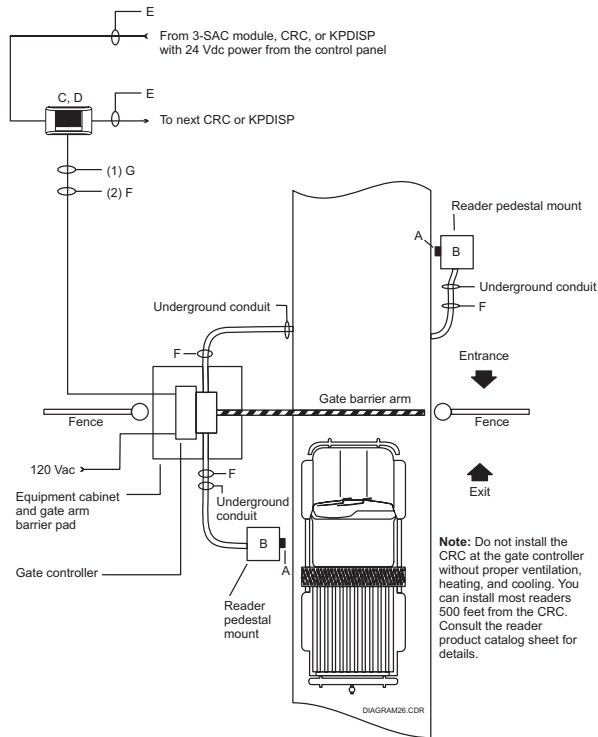
Parking lots are often controlled and managed by the use of parking gate barriers. For tracking employees in and out of a parking lot facility, most parking lots use a reader to allow entry into the parking lot and a reader to allow the exiting of the parking lot. Most parking gate barriers are usually configured to be “Self-Contained”. This means that the parking gate barrier has all the electronics and locking mechanisms built in to raise and lower the barrier arm. The only interface that the parking gate barrier requires is a contact closure from the CRCRL indicating authorization to enter. Check specific interface requirements from the parking gate barrier manufacturer.

## Parking Lot In / Out Reader

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	5375	MaxiProx Reader	EST or HID	2	
B	Custom	Pedestal Reader Mount	Custom	2	
C	CRC or CRCXM	Card Reader Controller	EST	1	
D	CRCRL	Relay used for strike or magnetic locks	EST	1	
E	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
F	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	
G	Obtained locally	6 Conductor 18 to 20 AWG	Cable Supplier	Lot	

# Parking Lot In / Out Reader Diagram



## Sales Tips



Use caution when proposing parking gate barriers. It is usually wiser to contract the installation and procurement of the parking gate barrier, the barrier pad, electrical work, reader pedestal, parking lot cutting, parking lot repair and fence alignment.



Sometimes a guard station is located beside the barrier gate. If the guard station requires manual release of the parking gate arm, add a request-to-exit button at the guard station and connect the request-to-exit button to the CRC for the parking gate barrier reader.



CRC communications can be configured using Class A or Class B wiring.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.

# Miscellaneous

## Application

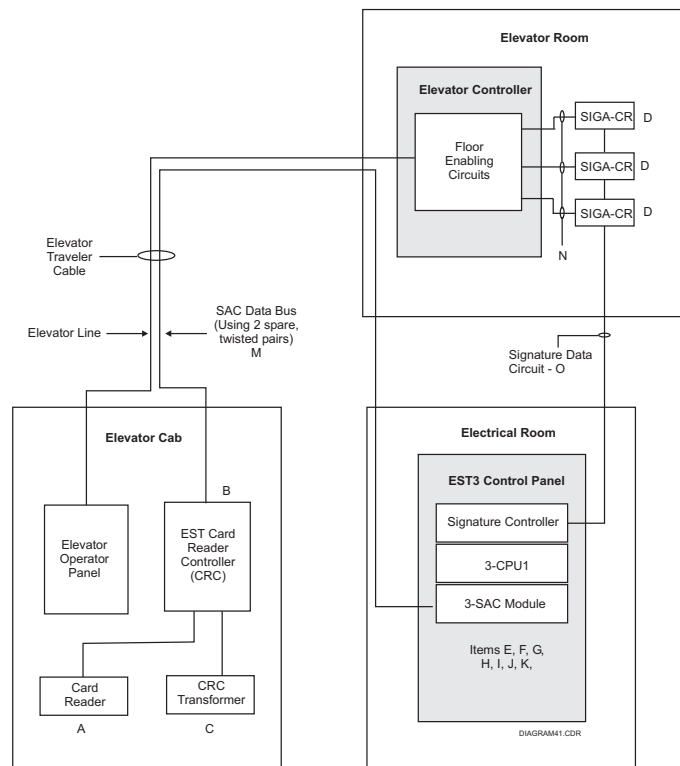
There are two main methods used to control elevators. The most common method is to place a reader inside or outside the elevator cab. When a valid credential is presented to the reader, the reader (through a connection to the elevator control panel) will enable the person to push any floor button, allowing them access to all floors. The connection typically is the relay contact (normally used for a lock) from the CRCRL to the elevator control panel.

As shown in the diagram above, the second method enables greater control over who and where a person may access one to several floors. When a person presents a valid credential to a reader inside or outside the elevator cab, the access control system will determine which floor(s) are available to the person and activate the buttons for the valid floors. The person may then pick any floor desired.

For this application, a Card Reader Controller and independent power source are installed in the elevator cab. When a cardholder presents his card, it is processed by the CRC. If valid, the CRC sends an access granted event and a command list request to the 3-CPU1 via the 3-SAC. The command list operates the Signature relay modules attached to the Signature Controller module. The relays are connected to the elevator controller, and turn on or off access to the correct floors, according to the cardholder's access group privileges. The command list includes timing, so the cardholder has a limited window of opportunity during which he can press the desired floor button. After the time has lapsed, he must present his card again. Note: This application must be used only for floor access, and NOT for elevator control.

## Elevator Control

## Diagram



## Elevator Control Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	1 per cab	
B	CRC or CRCXM	Card Reader Controller	EST	1 per cab	
C	CRCXF	120V/ 16.5V Transformer	EST	1 per CRC or CRCXM	
D	SIGA-CR	Control Relay Module	EST	1 per floor, per cab	
E	3CPU1	Central Processing Unit Module	EST	1	
F	3-RS485A3- RS485B3- FIB3-FIBA	Choice of a Network Communications Card	EST	Choice of one	
G	3-LCD	Liquid Crystal Display Module	EST	1	
H	3-PPS/M	Primary Power Supply	EST	1	
I	3-SAC	Security Access Control Module	EST	1	
J	3-CAB5	Complete Cabinet	EST	1	
K	3-LRMF	Blank local Rail Module Plate	EST	1	
L	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	
M	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
N	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
O	Obtained locally	1 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	

### Sales Tips



Use caution when proposing elevator readers. You should specify the type of cable required for the 3-SAC circuit in your proposal. It is usually wiser to have the elevator contractor provide the cable and termination points for the cable inside the elevator traveler cable. The elevator contractor in an area designated by you shall also provide 120 Vac. Specify sufficient space to mount the CRC, transformer and reader.

## Application

Multi-tenant applications can come in a variety of configurations. Synergy-enabled functions can provide various methods of configuring multi-tenant applications based on the customer's requirements. For the most part, wiring and configuring doors do not vary from other typical applications shown in the Synergy Application Handbook. The most demanding aspect of these applications is creating an environment of independent control for a number of different tenants using a single system. This often becomes apparent when trying to manage and report on events from the system.

The example below shows a typical multi-tenant application. Each tenant manages and controls their own facility while the property manager has control over common doors that all tenants utilize. Each tenant manages their own personnel by using the ACDB (Access Control Database Program) on one of their own computers. Each tenant can change, add, modify or report on personnel and event activities for their individual facilities. When a schedule change, new card holder, deletion of a card holder or other common management functions is required to be downloaded into the card reader controllers, a tenant will utilize the ACDB program using the dial up modem in their computer. The ACDB dials into the EST3 panel via the 3-MODCOM dialer / modem module. In this configuration, the database is stored in each tenant's computer and will not be shared or accessed by any other tenant or property manager. The property manager uses the ACDB in the same capacities as a tenant, and has control over all common doors available to tenants.

This example uses the ACDB8 for managing up to 8 doors on a single computer workstation. An optional ACDB8 Plus is available for managing an unlimited number of doors.

## Multi-tenant Configuration

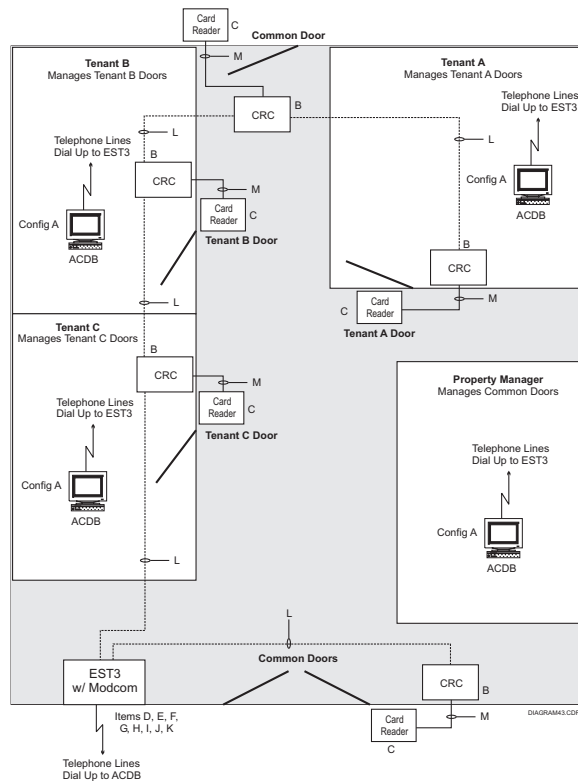
### Parts

Diagram Item	Part #	Description	Manufacturer	Quantity	Price
Configuration A	ACDB 8	Access Control Database Program - Manages up to 8 readers, single workstation	EST	One per tenant	
Configuration A	Softkey	One required for each workstation	EST	One per workstation	
Configuration A	Computer	Windows 98, ME or 2000 compatible computer	Customer Choice	One per ACDB program	Provided by customer
B	CRC or CRCXM	Card Reader Controller	EST	1 per door	
C	CR-5365	Proximity Card Reader	EST or HID	1	

# Multi-tenant Configuration Parts (continued)

Diagram Item	Part #	Description	Manufacturer	Quantity	Price
D	3CPU1	Central Processing Unit Module	EST	1	
E	3-RS485A 3-RS485B 3-FIB3-FIBA	Choice of a Network Communications Card	EST	Choice of one	
F	3-LCD	Liquid Crystal Display Module	EST	1	
G	3-PPS/M	Primary Power Supply	EST	1	
H	3-SAC	Security Access Control Module	EST	1	
I	3-CAB5	Complete Cabinet	EST	1	
J	3-LRMF	Blank local Rail Module Plate	EST	1	
K	3-MODCOM	Modem / Communicator Module	EST	1	
L	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
M	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	

## Diagram





## Sales Tips



Refer to the Access Control Database Program product sheet for current computer requirements.



To minimize markups and improve your project price, require that the customer provide the computer for the ACDB program in addition to the programming time for badge holders for their facility.



CRC communications can be configured using Class A or Class B wiring.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.

## Multi-tenant Configuration

## Continuous Lock Power Application

By continuous locks, we mean locks that operate, on average, more than 30 seconds in every minute. The CRC must be powered by either a 3-PPS/M, by a remote supply, or by an ac transformer. These sources power the CRC, card readers, and lock, and also maintain the battery charge. A typical application using continuous locks is shown below. The application shows the power coming from the 3-PPS/M in the control panel. The access control system requires a 24 Vdc power supply to power the CRC and to charge its battery. The 3-SAC connects to the CRC through the SAC bus. During open schedules, or when an authorized card is read at a card reader, the CRC provides power from the 3-PPS/M to the door strike to unlock the door. For maglocks, the CRC provides power from the 3-PPS/M to activate the lock during closed schedules, or between authorized card accesses.

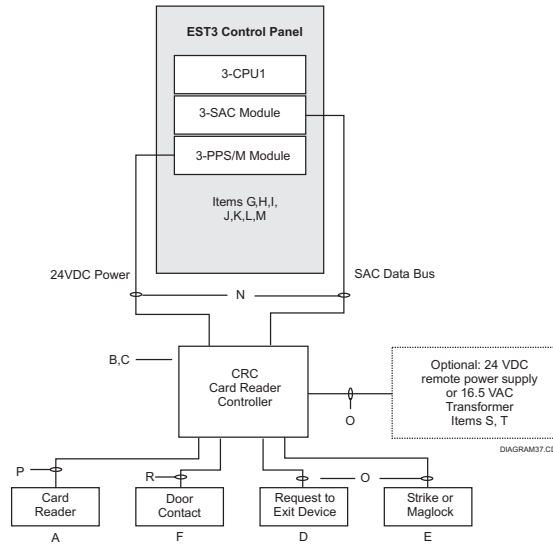
**Note:** Care should be taken when preparing EST3 control panel battery calculations as continuous locks may require power from the EST3 during AC power failure.

**Parts****Continuous  
Lock Power**

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	1	
B	CRC or CRCXM	Card Reader Controller	EST	1	
C	CRCRL	Relay used for strike or magnetic locks	EST	1	
D	6255	Passive Infrared Detector	Sentrol or equivalent	1	
E	N/A	Magnetic Lock or Strike	N/A	1	
F	1085T	Magnetic Door Switch	Sentrol or equivalent	1	
G	3CPU1	Central Processing Unit Module	EST	1	
H	3-RS485A 3-RS485B 3-FIB3-FIBA	Choice of a Network Communications Card	EST	Choice of one	
I	3-LCD	Liquid Crystal Display Module	EST	1	
J	3-PPS/M	Primary Power Supply	EST	1	
K	3-SAC	Security Access Control Module	EST	1	
L	3-CAB5	Complete Cabinet	EST	1	
M	3-LRMF	Blank local Rail Module Plate	EST	1	
N	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
O	Obtained locally	2 Conductor Twisted 14 or 16 AWG for CRC power and lock power	Cable Supplier	Lot	
P	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	
Q	Obtained locally	4 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
R	Obtained locally	2 Conductor 16 to 22 AWG	Cable Supplier	Lot	
Optional Power Source S	3-BPS/M	Booster Power Supply	EST	1	
Optional Power Source T	CRCXF	Transformer 16.5 AC	EST	1	

# Continuous Lock Power

## Diagram



## Sales Tips



Make sure to perform proper power calculations when configuring power requirements for locks.



Using booster power supplies will minimize costs to the customer that are often hidden. For example 120 Vac power outlets are typically required for card reader controllers. Powering the card reader controllers remotely could save project costs to your customer.



CRC communications can be configured using Class A or Class B wiring.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.

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## **Application**

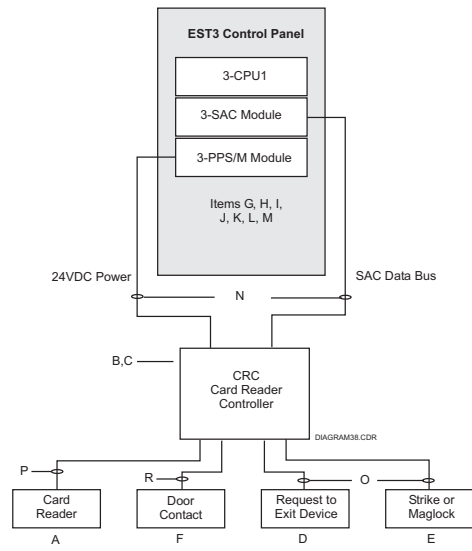
By intermittent locks, we mean locks that operate, on average, less than 30 seconds in every minute. The CRC can be powered by the 3-PPS/M or by a remote supply. It uses this power source to charge an internal 1.2 Ah sealed lead acid battery. The CRC's battery then provides the power needed to operate the door lock. Because the battery powers the door strike, this configuration cannot be used for maglocks or strikes that are active more than 30 seconds in a minute. In these conditions the battery would not have enough time to charge and keep up with the drain. A typical application using CRC battery power is shown below. The application shows the charging power coming from the 3-PPS/M in the control panel. The access control system requires a 24 Vdc power supply to power the CRC and to charge its battery. The 3-SAC connects to the CRC through the SAC bus. When an authorized card is read at a card reader, the CRC provides power to the door strike and unlocks the door.

## **Intermittent Lock Power**

## Intermittent Lock Power Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	1	
B	CRC or CRCXM	Card Reader Controller	EST	1	
C	CRCRL	Relay used for strike or magnetic locks	EST	1	
D	6255	Passive Infrared Detector	Sentrol or equivalent	1	
E	N/A	Magnetic Lock or Strike	N/A	1	
F	1085T	Magnetic Door Switch	Sentrol or equivalent	1	
G	3CPU1	Central Processing Unit Module	EST	1	
H	3-RS485A 3-RS485B 3-FIB3-FIBA	Choice of a Network Communications Card	EST	Choice of one	
I	3-LCD	Liquid Crystal Display Module	EST	1	
J	3-PPS/M	Primary Power Supply	EST	1	
K	3-SAC	Security Access Control Module	EST	1	
L	3-CAB5	Complete Cabinet	EST	1	
M	3-LRMF	Blank local Rail Module Plate	EST	1	
N	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
O	Obtained locally	2 Conductor Twisted 14 or 16 AWG for CRC power and lock power	Cable Supplier	Lot	
P	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	
Q	Obtained locally	4 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
R	Obtained locally	2 Conductor 16 to 22 AWG	Cable Supplier	Lot	

**Diagram**



**Intermittent  
Lock Power**

## Intermittent Lock Power

### Sales Tips



Make sure to perform proper power calculations when configuring power requirements for locks.



Using booster power supplies will minimize costs to the customer that are often hidden. For example 120 Vac power outlets are typically required for card reader controllers. Powering the card reader controllers remotely could save project costs to your customer.



CRC communications can be configured using Class A or Class B wiring.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.



When using multiple readers, ensure the total current from the readers does not exceed the CRC specification.



### Application

Several access control applications require the use of multiple card readers. For example:

- Visitor and escort readers
- High and low position readers

## Multiple Card Readers

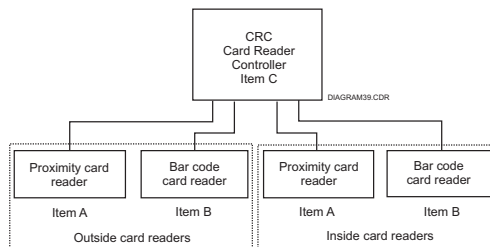
The CRC lets you use multiple card readers of the same technology or of mixed technologies. It can support up to four card readers, provided that the total current draw of the readers does not exceed the limits specified on the CRC installation sheet. A visitor and escort application using multiple card readers is shown below. In this application, both the escort and visitor must badge in to gain access. The escort has a permanent, plastic card, and uses the proximity card reader. The visitor is issued an inexpensive paper bar code card, and uses the bar code reader. This application works best with card readers that support dual LED control. The CRC uses the second LED (or LED state) to signal the visitor that the escort must badge in before access is granted.

This application only shows the reader configuration. For complete CRC door configuration refer to the appropriate application section.

### Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	2	
B	N/A	Bar Code Reader	ToyoOmronID SolutionsAccu-Time	2	
C	CRC or CRCSM	Card Reader Controller	EST	1	

### Diagram



## Multiple Card Readers

### Sales Tips



Any variety of reader technology can be used for this application.



The barcode reader must be able to provide a standard Wiegand protocol interface for connection to the CRC.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.

When using multiple readers, ensure the total current from the reader does not exceed the CRC specification.

## Application

Delayed egress doors help to control shoplifting at retail sites. A delayed egress door has card readers and a request to exit (REX) switch. Employees can badge in and out as they would at any other door. In an emergency, customers must press the REX switch to unlock the door. When the REX switch is activated, the CRC sounds the CRCSND horn and sends a security alarm event. It does not unlock the door immediately, thus allowing site staff time to investigate.

The CRC waits for a specific interval of time before unlocking the door. The typical delay time is 15 seconds; however, you may be able to use a delay of up to 30 seconds with the approval of the AHJ. The horn continues to sound for a specific period of time, or until the CRC is reset. After the delay time passes, the CRC unlocks the door, and latches it in the unlocked state. The CRC must be reset in order to relock the door and silence the horn. To reset the CRC, site staff must use a valid badge at the card reader.

The CRC also activates the CRCSND horn if the door is opened without a valid badge credential. For example, if the door is forced open from the outside, the CRCSND activates, even though the REX has not been pressed.

Many codes require that delayed egress doors unlock during a fire alarm, or when the panel is in trouble. This requirement allows occupants to evacuate the site immediately when a fire is detected, or when the panel loses its ability to detect a fire or sound the alarm. The application below shows a delayed egress door with inside and outside card readers and a request-to-exit switch. The CRC uses a door contact switch to determine the position of the door, and a maglock to lock the door. The door contact switch and REX switch are connected to the input loops of the CRC.

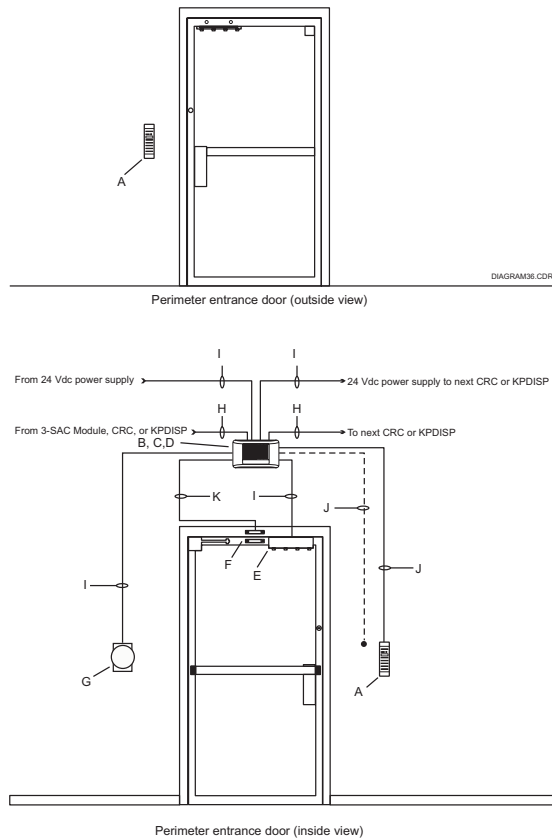
*Note: Refer to NFPA 101 and the local AHJ to determine the requirements for delayed egress applications.*

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	2	
B	CRC or CRCXM	Card Reader Controller	EST	1	
C	CRCL	Relay used for strike or magnetic locks	EST	1	
D	CRCSND	Card Reader Controller Sounder (mounts in the CRC enclosure)	EST	1	
E	370 Series	Magnetic Lock with 1500 lb holding force, 12 or 24 Vdc	Locknetics	1	
F	1085T	Magnetic Door Switch	Sentrol or equivalent	1	
G	AC-TS2	Request to Exit Button Station	Alarm Controls or equivalent	1	
H	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
I	Obtained locally	2 Conductor Twisted 14 or 16 AWG for CRC power and lock power	Cable Supplier	Lot	
J	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	
K	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	

## Delayed Egress

# Delayed Egress Diagram



## Sales Tips



Consult with local codes and AHJ for delayed egress requirements.



Using the CRCSND as a sounder can minimize project costs and can be used for a variety of applications.



CRC communications can be configured using Class A or Class B wiring.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.

## Application

A two-person rule ensures that no personnel can be in a controlled area alone. A card reader controller operating under two-person rule prevents the entrance of a single person into the controlled area. When two people are present in the area, one cannot exit without the other. The controlled area can have a single entrance or multiple entrances. The network coordinates user information between the card reader controllers that serve a common area. A typical two-person rule application is shown below.

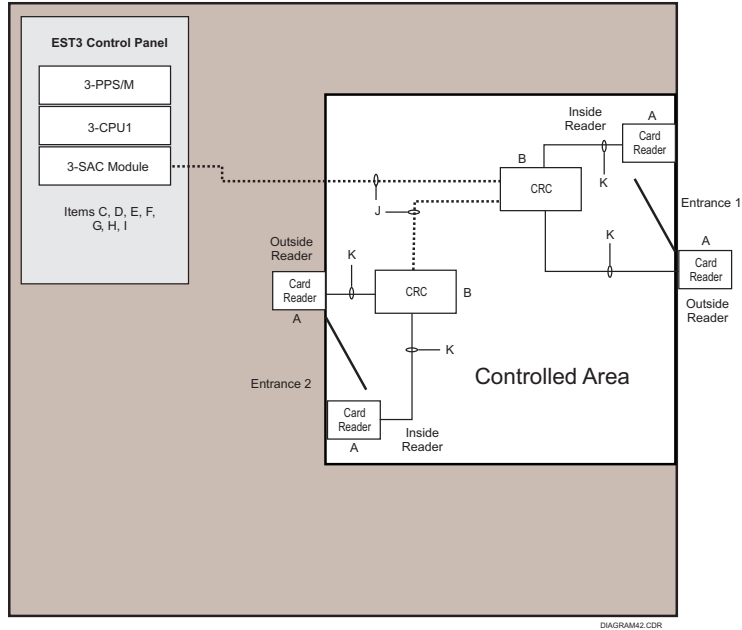
This application only shows the card reader controller and reader configuration. For complete card reader controller door configuration refer to the appropriate application section.

## Two Person Rule

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	CR-5365	Proximity Card Reader	EST or HID	1	
B	CRC or CRCXM	Card Reader Controller	EST	1	
C	3CPU1	Central Processing Unit Module	EST	1	
D	3-RS485A3- RS485B3- FIB3-FIBA	Choice of a Network Communications Card	EST	Choice of one	
E	3-LCD	Liquid Crystal Display Module	EST	1	
F	3-PPS/M	Primary Power Supply	EST	1	
G	3-SAC	Security Access Control Module	EST	1	
H	3-CAB5	Complete Cabinet	EST	1	
I	3-LRMF	Blank local Rail Module Plate	EST	1	
J	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
K	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	

## Two Person Rule Diagram



### Sales Tips



Monitoring a two-person rule can be performed through various configurations. The most common is to use a Fireworks workstation to indicate the rule violation. If cameras are installed in the controlled area, automatic switching can be performed through the Fireworks workstation to view and record the violation.



CRC communications can be configured using Class A or Class B wiring.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.

# EST3 Component Configurations

## Application

Installing a card reader controller or keypad display requires an EST3 panel. This can be an existing panel, providing that module slots are available or can be configured as new. Below are the minimum equipment requirements for an EST3 panel configured for connecting card reader controllers and / or keypad displays. This configuration also assumes that another panel contains the RS232 or Modcom module to communicate with the Access Control Database Program (ACDB).

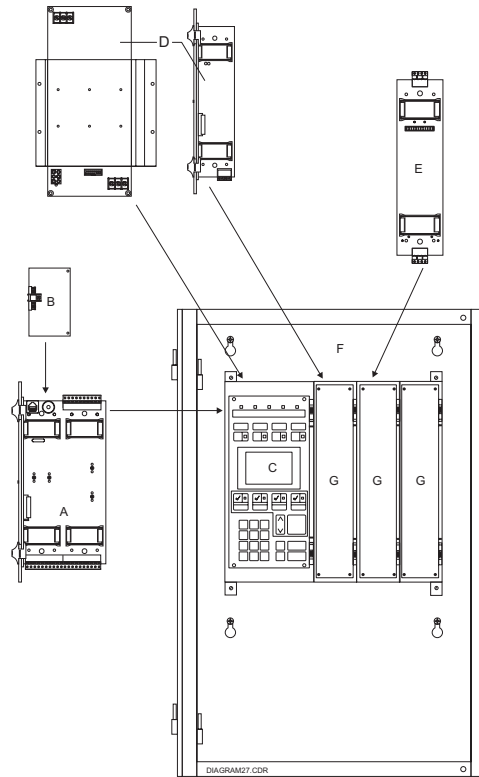
## EST3 Panel for CRC/KPDISP

## Parts

Diagram Item	Part #	Description	Manufacturer	Qty	Price
A	3CPU1	Central Processing Unit Module	EST	1	
B	3-RS485A 3-RS485B 3-FIB3-FIBA	Choice of a Network Communications Card	EST	Choice of one	
C	3-LCD	Liquid Crystal Display Module	EST	1	
D	3-PPS/M	Primary Power Supply	EST	1	
E	3-SAC	Security Access Control Module	EST	1	
F	3-CAB5	Complete Cabinet	EST	1	
G	3-LRMF	Blank Local Rail Module Plate	EST	1	

# EST3 Component Configurations

Diagram



## Sales Tips



Carefully study cabinet configurations when designing a project. Planning for future module additions by providing larger cabinets will decrease overall installation and equipment costs.



## Application

In any access control system, a card reader and card reader controller can be used to operate devices that are completely remote from the card reader controller. In such cases the card reader controller simply creates an access event and passes it to the 3-SAC for processing by the 3-CPU1. Any device that can be controlled by an EST3 panel can be operated in response to an access event.

As a typical example, the application below shows how the entrance devices to a secured parking area could be operated from a remote card reader. Note that any type of CRC input device could be used in place of a card reader.

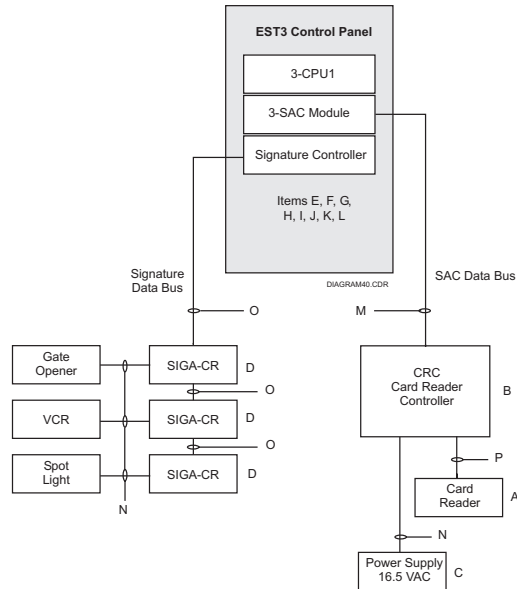
When any cardholder of a specific access level swipes their card, the access event is sent from the card reader controller to the 3-SAC and then to the 3-CPU1. At the 3-CPU1, the access event activates a predefined command list. The command list operates the Signature relays on the Signature data circuit supported by the Signature controller module. These relays activate the gate opener, a spotlight, and a VCR image recording system. An inside card reader could be used to control exits from the area, but it would be more appropriate to use a motion detector, since egress from the area is not controlled.

This application shows only the card reader controller, reader and relay configuration. For complete card reader controller parking lot configuration refer to the appropriate application section.

## Remote / Event Activated Control

## Remote / Event Activated Control Parts

Diagram Item	Part #	Description	Manufacturer	Quantity	Price
A	CR-5365	Proximity Card Reader	EST or HID	1 per cab	
B	CRC or CRCXM	Card Reader Controller	EST	1 per cab	
C	CRCXF	120V/ 16.5V Transformer	EST	1 per CRC or CRCXM	
D	SIGA-CR	Control Relay Module	EST	1 per floor, per cab	
E	3CPU1	Central Processing Unit Module	EST	1	
F	3-RS485A 3-RS485B 3-FIB3-FIBA	Choice of a Network Communications Card	EST	Choice of one	
G	3-LCD	Liquid Crystal Display Module	EST	1	
H	3-PPS/M	Primary Power Supply	EST	1	
I	3-SAC	Security Access Control Module	EST	1	
J	3-CAB5	Complete Cabinet	EST	1	
K	3-LRMF	Blank Local Rail Module Plate	EST	1	
L	3-SDDC	Signature Loop Controller	EST	1	
M	Obtained locally	2 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
N	Obtained locally	2 Conductor 16 AWG to 22 AWG	Cable Supplier	Lot	
O	Obtained locally	1 - Twisted Pair 18 or 19 AWG for Data	Cable Supplier	Lot	
P	Obtained locally	8 Conductor stranded 22 AWG with overall shield	Cable Supplier	Lot	

**Diagram****Remote / Event  
Activated Control****Sales Tips**

Command List Note: A command list can operate a function from a CRC. At this time you cannot have separate command lists for an ingress reader and an egress reader. For example, you may not have a command list activate the lights when you enter an area and a separate command list to turn off the lights when you exit an area.



CRC communications can be configured using Class A or Class B wiring.



A CRCRL lock relay is used if the lock current or voltage is outside the rated CRC specification.



When locks are powered from non-limited power supplies and you are using the CRCRL lock relay, the CRCRL must be mounted in a separate junction box to meet UL requirements. If the CRC is mounted on a junction box, that junction box can be used to mount the CRCRL lock relay.



## Security and Access Control Handbook

*A practical guide to application and system design*

Since building functions first required control by multiple systems there's been a need to make them simpler and more efficient. No matter how sophisticated our buildings become, there will always be ways to improve them by finding common ground among systems, and consolidating elements that fulfil similar functions. For example: an audio system used for fire alarm communication can, where authorities permit, pull double-duty as a security notification system; power supplies can accommodate card readers as well as fire alarm strobes; wiring can serve both motion sensors and smoke detectors.

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