Thank you for purchasing the Q2010 Access Controller. While every effort has been made to ensure the accuracy of the information in this document, LiftMaster assumes no liability for any inaccuracies contained herein. LiftMaster reserves the right to change the information contained herein at any time without notice.

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

© 2008 Chamberlain Access Solutions. All rights reserved.

Q2010™, StorLogix™, “Security Without Limits”™, LogixServer™, LogixScript™, VideoViewer™, EventViewer™, Site Graphics™, “Easy to Implement, Simple to Use”™, are trademarks of Chamberlain. All rights reserved.

Microsoft Windows 2000®, Microsoft Windows XP®, Adobe Reader®, Symantec pcAnywhere®, Pentium®, McAfee Virus Scan®, Norton Antivirus® and all other trademarks referenced are the property of their respective owners.
USING THIS MANUAL

This manual is designed to be followed from start to finish for the installation of the Q2010 access control system.

There is a Glossary in the back of the manual to define terms that may not be understood. In addition to this, the Index can help you to locate more information about specific topics.

Throughout the manual, there are graphics with cautions, things to remember, hints, and suggested applications. Watch for these as they will help make for a smoother installation.
CHAPTER 1: PRE-INSTALLATION

Overview
System Requirements
Specifications
Pre-Installation Recommendations
Equipment Location and Site Layout
ADA Guidelines for Access Control
Tools Needed
Hardware Needed
Wire and Cable Needed
Typical Wiring Scheme
Wire Splicing
Surge Protection

This chapter presents necessary information to consider prior to installing the Q2010 Access Controller.
Overview

The Q2010 provides a comprehensive hardware and software package with the following features:

- 8 inputs on the main board that can be used for door alarms, motion sensors, beams, or almost any other type of alarm switch
- 4 output relays on the main board that can be used to open gates or doors, activate lights, control elevators, shunt alarms, act as secure interior relays, or perform custom function switching
- 2 Wiegand Protocol Device inputs on the main board that allow the connection of proximity card devices, key fob devices, biometric fingerprint devices, and many other types of Wiegand protocol devices
- A built-in 12VDC 2A power supply with 4Ah battery backup
- Integration with a computer using RS232, USB, or Ethernet TCP/IP
- Supports up to 127 Access Interface (AI) devices.
- Can be connected to 900 MHz Wireless Access Devices
- Redundant Memory Backup
Specifications

Power Supply:
- Input Voltage: 24VAC @ 40VA or 24VDC @ 2.5A
- Output Voltage: 14VDC – 2A

Relay Outputs (resistive load):
- Maximum Switching Voltage: 30VAC/DC
- Maximum Switching Current: AC: 10A (NO) / 3A (NC)
  DC: 5A (NO) / 3A (NC)
- Maximum Switching Capacity: 1250VA 150W (NO)
  375VA 90W (NC)
- Minimum Permissible Load: 10mA at 5VDC
- Contact Resistance: 100mΩ maximum
- Life Expectancy: (at maximum rated load)
  Mechanical: 10,000,000 operations
  Electrical: 200,000 operations minimum

Inputs:
Dry Contact Type ONLY. Do Not apply voltage to any of the inputs.
Dry Contact Specifications:
- Contact Resistance: 500mΩ Maximum
- Current Capacity: 100mA at 5VDC Minimum

Environmental:
- Ambient Temperature: -40°C to +80°C (-40°F to 176°F)
- Ambient Humidity: (see note)

Note: The humidity inside the housing for any Q2010 access controller or AI device cannot exceed 85% and must be noncondensing.

Please see the Appendix for System Requirements for computers, components, and peripherals used with the Q2010 Access Control System.
Pre-Installation Recommendations

Proper installation is the most important key to having a system that functions and operates as it should. While it initially may seem that you are saving money by cutting corners on the installation, your overall satisfaction with the system will be better if you spend the time and money to do it correctly from the start. A poor installation ultimately will be very frustrating, costing much more money as it can lead to loss of revenue as well as many hours of technical support and service personnel time to fix issues with the install.

Choice of Installer

We strongly recommend that installation and setup of any equipment be done by a certified, licensed, qualified, and competent technician. With any setup or installation, some troubleshooting and adjustment of the configuration may be required. This will differ with every installation and computer setup depending on many site-specific variables. This troubleshooting and configuration may include purchasing additional equipment. In no circumstances will LiftMaster be responsible for any damages either incidental or consequential based on these recommendations.

Spend the time to find a reputable installer for your site. Don’t just consider the lowest price. Price is important, but definitely not as important as quality. A cheap, poor install will always cost more than a quality installation that costs a little more initially.

Take the time to get quotes from several installers. Check references, and contact the Better Business Bureau and local licensing bureaus. Look for an installer who has been in business in your area for years and has a history of installing this type of equipment.

Look for an installer that will provide at least a 1 year warranty on the installation and who is willing to do a paid service contract after that.
CHAPTER 1: PRE-INSTALLATION

Code and Legal Considerations

Installation of equipment must be performed per recommendations and guidelines except where local, municipal, and state codes; the National Electrical Code; and Construction codes take precedence. When Code and our guidelines do not cover a given situation, it is the installer’s responsibility to follow established custom and best practices applicable to the particular trade. Installers must know and abide by all existing laws pertaining to their work. **Meeting code is always your responsibility and LiftMaster cannot be held liable if you do not install to code.**

Power

Reliable equipment operation depends on a noise-free uninterrupted source of power. The Q2010 battery backup feature is provided primarily to preserve the integrity of the memory database and operation of the Q2010. It does not guarantee operation of the gate motor or door actuator for emergency situations in the event of a power loss or equipment failure. It is the sole responsibility of the purchaser to provide for and facilitate manual nonelectrical emergency means of exit in the event of a power failure. Contact your local dealer/installer for options and availability. Verify that there are enough 120V outlets in the office (and/or maintenance rooms) where the equipment will be located to support the equipment needs. Also, consider other office equipment and electronics that require power such as copiers, fax machines, computers, telephones, lights, water coolers, etc. Each power supply, Q2010 access controller, computer, video monitor, etc will require at least one outlet. We recommend a minimum of two, 4-outlet stations for the equipment; however, your site may require more.

Auxiliary Security Devices

Power for door strikes, gate operators, sirens, cameras, and any equipment other than the Q2010 and AI devices must be provided by separate power supplies. Never power a door strike or siren from the same power supply that an AI device is connected to. This must be considered when planning power needs for a site.
Wire

Refer to Wire Recommendations for recommendations on the proper wire. Be sure to plan on enough wire plus an additional 10% - 15% for safety. Take into consideration the linear distance, distance in rise for multiple floors, or the distance in depth for burial when ordering wire. Be sure to pull an extra 10 feet of wire at each end of a wire pull as you are installing. This allows enough wire to meet the needs of the site without having to splice extra wire. When you are ready to install the AI devices, trim the excess, leaving a one-foot service loop. It is a wise idea to pull an extra 18 AWG 4-conductor wire throughout the site and set aside several extra sets of conductors in the 24 AWG 50-conductor wires for future add-ons, maintenance, or repair of wiring, if needed. It is less expensive and easier to do this up-front than to try and pull wire later. This is especially important if additional construction phases are planned.

Conduit

Consider purchasing the next size larger than needed to allow for future expansion and maintenance. Consider also pulling extra wire-pull strings. This is especially important if future construction phases or expansion are planned. Be sure to have pull boxes at all conduit terminations. Use only electrical conduit with sweep 90 degree bends. Never use sprinkler PVC, plumbing pipe, or direct 90 degree elbow bends. All splices should be in junction boxes above ground.

Advance Review

Review included manuals and documentation before installation. Order equipment with enough advance notice to have it on-site prior to installation. When a shipment is received, promptly check the equipment received against the packing list to verify that all parts have been delivered. Also, verify that there isn’t any shipping damage.
Equipment Location and Site Layout

Equipment location and mounting should be laid out and planned before installation begins. Use a set of site plans to lay out equipment locations and to determine the amount of conduit and wire needed. Plans should be kept in a safe location after installation to help with future additions and site maintenance.

Q2010 Location

A secure room, closet, or cabinet should be set aside for the Q2010 access controller. The room often will also contain DVRs, power supplies, relay boards, and alarm panels. This room should have adequate ventilation with air conditioning and be secure, but with access for maintenance.

QMS Computer

The QMS computer is generally located at a main location, but must be in proximity to the Q2010 depending on cable length and type of connection. Refer to Connecting the Q2010 to the Computer for more information.
Keypads and Proximity Readers

Keypads and proximity readers are generally mounted on gooseneck stands, bollards, or on the wall near the gate, door, or elevator that is being accessed. Be sure to consider traffic flow, ease of access, Americans with Disabilities Act (ADA) standards, and local code when planning the mounting location. Gooseneck stands, bollards, and gate operators are generally mounted on a concrete pad. Refer to manufacturer instructions for pad size and type.

Generally, the relay that trips a gate or door should be located in a secure area. This is called a secure interior relay. For example, a gate has an entrance keypad and an exit keypad. The gate operator should only be connected to the exit keypad relay. When a client uses the entrance keypad, the Q2010 can be programmed to use the exit keypad’s relay to open the gate. This prevents someone who does not have access to the property from breaking into the keypad or bollard and crossing wires to open the gate. This is required for UL installations.

Door Alarm Switches

Most hardwired door alarm switches and magnets are placed on the inside latch side of the door and wired into a single door expansion module or the Q2010 access controller.

Power Supplies

Power for AI devices is provided by the Q2010 access controller. Other power supplies for the AI devices may be placed throughout the site as necessary for voltage drop and current draw considerations. Additional power supplies must always be wired with an RB5 relay to allow central reset capability. See Adding Additional Power Supplies for more information. Power for other equipment such as cameras, sirens, door strikes, and gates will need to be considered as per manufacturer recommendations.

Relay Boards

Relay boards are generally installed in interior locations or inside junction boxes that are accessible for maintenance if needed. Relay boards should never be mounted in an inaccessible area. Relay boards for elevator controls will generally be in or very near the elevator control room.

Other Equipment

DVRs, alarm panels, sirens, cameras, and most other equipment will be located as to manufacturer recommendations.
ADA Guidelines for Access Control

The Americans with Disabilities Act of 1990 (ADA) prohibits discrimination in and ensures equal access to employment, government services, public accommodations, transportation, and commercial facilities for persons with disabilities. Some of the guidelines and requirements from this law can be applied to access control. Because many local municipalities have much stricter standards than the ADA, we strongly recommend that owners, builders, and installers consult a qualified expert in local, state, and federal interpretations of ADA and similar laws. For more information about the ADA, visit the ADA website at www.ada.gov or the Department of Justice ADA website at www.usdoj.gov/crt/ada/ or call the ADA Information Line at (800) 514-0301.

Recommendations for Sites

The ADA and other similar laws are open to some degree of interpretation by local authorities and courts. It is in your best interest to familiarize yourself with the complete requirements for ADA and other similar local laws. Most important, however, is to work to provide reasonable access to your services by persons of all abilities. Below are some recommendations that may help.

- Contact a local inspector or architect who can provide assistance in designing the access to your facility with respect to ADA and other similar laws.
- Visit the ADA website or call the information line listed above.
- Provide adequate, well-lit signs (written, picture, and Braille).
- Design hallways with adequate room for wheelchairs.
- Provide adequate access to all keypads, access devices, and elevator controls as provided for in ADA.
- Use Keypads with proximity cards or key fobs and audible signals to provide greater access flexibility.
Height and Reach Requirements for ADA

The ADA has certain height and reach requirements to allow access for customers in wheelchairs. These requirements may cause the weather overhang on a keypad to obstruct the vision of taller customers. To eliminate this problem, a housing that does not have a weather overhang is available. Q access keypads may also be mounted in a wall using a flush mount kit to prevent this issue.

1. Keypads should be mounted so that the top of the number touchpad is no more than 48 inches above the finished floor with no obstructions in locations where wheelchair access is available only from the front. Keypads can be placed higher if a wall mount gooseneck allows closer access to the keypad.

2. Keypads should be mounted so that the top of the number touchpad is no more than 54 inches above the finished floor with no obstructions in locations where the wheelchair has sideways access.

3. Keypads should be mounted so as not to protrude more than 4 inches from the wall. If mounted in a bollard or pylon, it may protrude up to 12 inches. Items mounted higher on the wall or ceiling must be 80" or higher above the finished floor.
4. Computer keyboards and other office equipment should be placed on desks between 28” – 34” tall with no more than 20 inches in reach depth for obstructed front access or 24 inches in reach depth for obstructed side reach access. In the first figure below, if $X < 20"$ then $Y = 48"$. When $X = 20" - 25"$, then $Y = 44\"$. $X$ should always be $\leq 25\"$.

All information contained herein is from the ADA website and the Department of Justice Code of Federal Regulations Excerpt CFR Part 36 ADA Standards for Accessible Design revised July 1, 1994. LiftMaster is not liable for the information contained in this document and we strongly recommend that installers, owners, and builders work with qualified experts in the local, state, and federal interpretations of ADA and other similar laws. Refer to the ADA Standards for Accessible Design and Federal regulations for more specific information and requirements.
Tools Needed

The following tools are necessary to complete a normal installation. Depending on the construction of the site and other considerations, other tools may be required.

A. Rotary Hammer Drill
B. Caulking Gun
C. Drywall Punch Saw
D. Assorted Screwdrivers
E. Precision Screwdrivers
F. ¼” Nut Driver
G. Multimeter
H. Wire Fish Tape
I. Bits for Hammer Drill
J. Bits for Drill/Driver
K. Drill Screw Bit
L. 3M E9-Y Crimper
M. Crimping Pliers
N. Wire Strippers
O. Wire Cutters
P. Assorted Pliers
Q. Flashlight
R. Sharp Markers
S. Tape Measure
T. Hole Saw
U. Rechargeable Drill/Driver
V. Claw Hammer
W. Razor Blade or Knife
X. Assorted Tin Snips
Y. Wireless Tester
Z. Mux Punchdown Tool
AA. Assorted Hex Keys
BB. Rivet Gun
CC. Scissors or Shears
DD. Torpedo Level
EE. Assorted Box Wrenches
FF. Assorted Vice Grips
GG. Adjustable Wrenches
HH. Safety Glasses
II. Work Gloves
JJ. Conduit Bender
KK. 9V Battery w/ Test Clips
LL. Conduit Cutter/Reamer
MM. Hack Saw
Hardware Needed

The following hardware is necessary to complete a normal installation. Depending on the construction of the site and other considerations, other hardware may be required.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Red Head Concrete Wedge Anchors</td>
</tr>
<tr>
<td>B</td>
<td>Tapcon Concrete Anchors +</td>
</tr>
<tr>
<td>C</td>
<td>Hammer Set Concrete Anchors</td>
</tr>
<tr>
<td>D</td>
<td>Self Tapping Concrete Anchors</td>
</tr>
<tr>
<td>E</td>
<td>Sheet Metal and Wood Screws +</td>
</tr>
<tr>
<td>F</td>
<td>Drywall Screws +</td>
</tr>
<tr>
<td>G</td>
<td>Toggle Bolts +</td>
</tr>
<tr>
<td>H</td>
<td>Machine Washers +</td>
</tr>
<tr>
<td>I</td>
<td>Plastic Wall Anchors +</td>
</tr>
<tr>
<td>J</td>
<td>Heavy Duty Self Drilling Drywall Anchor+</td>
</tr>
<tr>
<td>K</td>
<td>Sheet Metal Rivets +</td>
</tr>
<tr>
<td>L</td>
<td>Screwhead Mounting Wire Ties +</td>
</tr>
<tr>
<td>M</td>
<td>Cable Clamps and Mounts +</td>
</tr>
<tr>
<td>N</td>
<td>Caddy Clips +</td>
</tr>
<tr>
<td>O</td>
<td>18 AWG Spade Connectors</td>
</tr>
<tr>
<td>P</td>
<td>3M U-Type Connectors (UR2, UY2, UG)</td>
</tr>
<tr>
<td>Q</td>
<td>Wire Nuts +</td>
</tr>
<tr>
<td>R</td>
<td>Electrical Tape</td>
</tr>
<tr>
<td>S</td>
<td>PL Premium Construction Adhesive</td>
</tr>
<tr>
<td>T</td>
<td>Silicone Sealant – Heavy Duty Outdoor</td>
</tr>
<tr>
<td>U</td>
<td>Fire Barrier Sealant</td>
</tr>
<tr>
<td>V</td>
<td>Panduit Wire Raceway</td>
</tr>
<tr>
<td>W</td>
<td>Wire Pulling Lubricant</td>
</tr>
<tr>
<td>X</td>
<td>Conduit Compression Fittings/ Mounts +</td>
</tr>
<tr>
<td>Y</td>
<td>Flexible Conduit</td>
</tr>
<tr>
<td>Z</td>
<td>Electrical Conduit with Sweep 90 Bends</td>
</tr>
</tbody>
</table>

+ Note: Assorted lengths, sizes, and types will be needed.

Mounting Hardware Recommendations

<table>
<thead>
<tr>
<th>Surface Type for Mounting</th>
<th>Recommended Mounting Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drywall between Studs</td>
<td>Self Drilling Drywall Anchors or Toggle Bolts</td>
</tr>
<tr>
<td>Drywall on Studs</td>
<td>Self Tapping Drywall Screws</td>
</tr>
<tr>
<td>Stucco</td>
<td>Toggle Bolts</td>
</tr>
<tr>
<td>Wood</td>
<td>Drywall Screws</td>
</tr>
<tr>
<td>Sheet Metal</td>
<td>Self Tapping Sheet Metal Screws</td>
</tr>
<tr>
<td>Hollow Block</td>
<td>Tapcon Concrete Anchors or Toggle Bolts</td>
</tr>
<tr>
<td>Brick or Solid Block</td>
<td>Tapcon Concrete Anchors or Concrete Wedge Anchors</td>
</tr>
<tr>
<td>Masonry or Concrete</td>
<td>Tapcon Concrete Anchors or Concrete Wedge Anchors</td>
</tr>
</tbody>
</table>

All anchors should be size #8 head with a length of 1 1/2” or longer (based on wall depth)
Wire and Cable Needed

The following are the recommended wire types for installing the Q2010 system as well as many of the other access control and security products that compliment our system. Planning and installing the wiring of a site is a process that requires a high degree of technical knowledge; wiring layout should be done by a trained professional.

### AI Device Power & Data Wire Recommendation (from Q2010 to AI Devices)

<table>
<thead>
<tr>
<th>Belden Wire Code</th>
<th>Ω per 1000' Resistance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9418</td>
<td>6.92</td>
<td>18 AWG, 4-conductor stranded copper wire with overall shield and common ground (PVC Insulation) *</td>
</tr>
<tr>
<td>89418</td>
<td>6.92</td>
<td>18 AWG, 4-conductor stranded copper wire with overall shield and common ground (Plenum Insulation)</td>
</tr>
<tr>
<td>9552</td>
<td>6.92</td>
<td>18 AWG, 4-conductor stranded copper wire with overall shield and common ground (Direct Burial)</td>
</tr>
</tbody>
</table>

* Denotes standard recommended wire.

Never use wire smaller than 18 AWG for installing power and data to AI devices. Never use network cable or any other unshielded wire for installing power and data to AI devices. Data wire length should never exceed 4000' in a single linear distance. Maximum length for power will vary significantly because of voltage drop due to current draw, number of devices, splices, and other factors.

### Door Alarm Wire Recommendation (from Q2010 or SDM to Door Switches)

<table>
<thead>
<tr>
<th>Belden Wire Code</th>
<th>Ω per 1000' Resistance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>9585</td>
<td>25.67</td>
<td>24 AWG, 50-conductor solid copper wire (PVC Insulation) *</td>
</tr>
<tr>
<td>N/A</td>
<td>25.67</td>
<td>24 AWG, 50-conductor solid copper wire (Plenum Insulation)</td>
</tr>
<tr>
<td>165185110</td>
<td>25.67</td>
<td>24 AWG, 50-conductor solid copper wire (Direct Burial)</td>
</tr>
</tbody>
</table>

* Denotes standard recommended wire.

Never use wire smaller than 24 AWG for installing door switches. Never use stranded wire for installing door switches. For applications that require shielded trunk line, use Direct Burial cable.
Cameras/Video Wire Recommendations (From DVR to Camera)

<table>
<thead>
<tr>
<th>Belden Wire Code</th>
<th>Ω per 1000' Resistance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>549945</td>
<td>10.15/6.92</td>
<td>RG59U / 18 AWG 2-Conductor in same cable (PVC Insulation) *</td>
</tr>
<tr>
<td>649948</td>
<td>10.15/6.92</td>
<td>RG59U / 18 AWG 2-Conductor in same cable (Plenum Insulation)</td>
</tr>
<tr>
<td>8241</td>
<td>10.15</td>
<td>Coaxial Cable with 22 AWG core and stranded copper common ground (PVC Insulation)</td>
</tr>
<tr>
<td>89259</td>
<td>10.15</td>
<td>Coaxial Cable with 22 AWG core and stranded copper common ground (Plenum Insulation)</td>
</tr>
<tr>
<td>8212</td>
<td>10.15</td>
<td>Coaxial Cable with 22 AWG core and stranded copper common ground (Direct Burial)</td>
</tr>
<tr>
<td>8760</td>
<td>6.92</td>
<td>18 AWG, 2-conductor stranded copper wire with overall shield and common ground (PVC Insulation) **</td>
</tr>
<tr>
<td>9946</td>
<td>17.5</td>
<td>22 AWG, 10-conductor stranded copper wire with overall shield and common ground (PVC Insulation) ***</td>
</tr>
<tr>
<td>9585</td>
<td>25.67</td>
<td>24 AWG, 50-conductor solid copper wire (PVC Insulation) ***</td>
</tr>
</tbody>
</table>

* Denotes standard recommended wire
** 18-02-S can be used for power by many types of cameras.
*** 24-50 or 22-10 can be used for interior video signal using Baluns (see Application Note).

Typical Wiring Scheme

The following pages show a typical site wiring scheme. These are shown to give the installer an idea of equipment layout and wire planning. Each site will be different and must be planned accordingly.

Baluns are video signal converters that allow twisted pair cable to be used to carry video signals up to 1200 feet. Two baluns are required for each camera connection (one at the camera end and one at the DVR end.) This is an efficient way to run video signals on sites with a lot of cameras.
REFER TO SIREN MANUFACTURER INSTALLATION INSTRUCTIONS FOR PROPER SIREN WIRING.

REFER TO GATE OPERATOR MANUFACTURER INSTALLATION INSTRUCTIONS FOR PROPER WIRING TO KEYPAD RELAY.

CONNECT TO EARTH GROUND

Q2010 BOARD

Q2010

12VDC POWER SUPPLY
DEDICATED POWER SUPPLY FOR SINGLE SIREN ONLY

TO QMS COMPUTER

EXIT KEYPAD

GATE OPERATOR

ENTRANCE KEYPAD

TO OTHER AI DEVICES
CHAPTER 1: PRE-INSTALLATION

REFER TO DOOR STRIKE MANUFACTURER INSTALLATION INSTRUCTIONS FOR PROPER WIRING TO KEYPAD RELAY.

FROM Q2010 & 12VDC DOOR STRIKE 12VDC POWER SUPPLY

DEDICATED POWER SUPPLY FOR SINGLE DOOR STRIKE ONLY

REFER TO DOOR STRIKE MANUFACTURER INSTALLATION INSTRUCTIONS FOR PROPER WIRING TO KEYPAD RELAY.

CONNECT TO EARTH GROUND (DC POWER CONNECTION SHOWN)

TO OTHER AI DEVICES
(REFER TO THE ‘INSTALLING THE AI DEVICES’ CHAPTER FOR SPECS ON AI DEVICES)

Q ACCESS KEYPAD

SINGLE DOOR EXPANSION MODULE

RELAY BOARD

MODLE SHOWN FOR REF

FROM Q2010 & OTHER AI DEVICES
Wire Splicing

Wire splices must be kept to a minimum. Every splice increases conductive resistance, reducing the effective distance of the electrical power or signal. Also, every splice is a potential failure point for the system due to the danger of corrosion in the wire, improper joint connections, radio frequency interference, ground faults, and other factors. Improper splices run the risk of intermittent system problems that can be very difficult to troubleshoot. Try to plan and install the site so that the only splices in the system occur in the terminal blocks that connect to each AI device. If a splice is absolutely necessary, it must be done in an above-ground, weatherproof, electrical-rated, junction box. The proper procedure for making a wire splice is as follows:

1. Inside the junction box, pull an extra foot of wire for each side of the splice. This is called a service loop and allows extra wire for future service or replacement of the splice if it is done incorrectly, becomes corroded, or is otherwise damaged.

2. Trim back 1½ inches of the outside insulation jacket on the cable. Do NOT strip the insulation off of individual conductor wires. Place the two wires to be spliced side by side and twist them together for about ½ inch, leaving about 1 inch of wire free to be slid into a 3M U-type connector.

3. Verify that both wires are seated completely at the bottom of the connector. Then, using a 3M E9-Y crimping tool, crimp down the button on the connector. For best results, crimp each connector three times in different places around the edge of the button. Verify that the button is evenly crimped all the way around and that it does not pop back up on one side.

Never pull spliced wire through conduit. Splices should only be made in wire that is already pulled into a junction box.

Never splice two different colors, gauges, or types of wire. Wire color, gauge, type, and purpose must remain consistent throughout a site.

For example: Using the given wiring recommendations, the AC+ wire should be white, 18 AWG stranded copper wire throughout the site.

Never pull spliced wire through conduit.
4. Wrap electrical tape around the splice and partway up the wires to help seal and protect the connection. Place a wire tag on the wires inside the junction box, identifying what the wire is connected to at each end.

**Remember**
Splices should be kept to a minimum or eliminated completely from a site whenever possible.

Any splices that must be made should be located in an all-weather electrical junction box that is mounted above ground in accordance with electrical code.

**Hint**
At every splice, pull box, junction box, and AI device connection, a ‘service loop’ should be made. This is an extra 1’ – 2’ of wire pulled to the junction box to allow for future maintenance or correction of the splice or connection. After the splice or connection is made, the extra wire is neatly coiled in the box or slid back into the gooseneck or wall behind the device.
Surge Protection

Power fluctuations and surges are issues faced by all access control systems and electronics. The Q2010 has excellent built-in surge protection; however, if you are in an area that is prone to brownouts, blackouts, electrical storms, or other major power interruptions or fluctuations, we recommend that your system be equipped with the following safeguards against these problems.*

- If you are in an area that is prone to regular lightning strikes or electrical storms, you should obtain adequate lightning insurance coverage from an insurance agent for all electronic equipment.
- UL rated power supplies adequately rated to provide at least 12 volts (AC or DC) and no more than 18 volts (AC or DC) at each AI device as well as sufficient amperage throughout the system.
- Power conditioning and surge suppression in the form of an uninterrupted power supply (UPS) system connecting the Q2010, the access control system's power supplies, and any computers to 120V power. The Q2010 and system power supplies should be connected to separate UPSs from the computer. Each component plugged into a UPS reduces the actual battery backup time.
- Ditek or Opto-Isolator surge protection for the RS232 and RS485 at the Q2010 and at each AI device.
- Gates, door strikes, and elevators should have battery backup or other safety measures that meet local and national electrical codes.
- Office computers, copiers, fax machines, telephones, and other electronics should be plugged into surge protectors or a separate UPS.
- For ongoing power issues, contact your local electric company for their recommendations. Often, they can install power conditioners and/or surge suppressors on incoming power lines to help protect your site.

* These recommendations should provide protection against most common power surges, power fluctuations, indirect lightning strikes, and general electrical storm activity; unfortunately, due to the naturally destructive nature of lightning and electrical storms, there is only so much protection that can be provided to any hard-wired electronic system. Any local or direct strike may damage one or more pieces of electronic equipment in the vicinity and may damage or destroy the surge protectors or, in some cases, the entire system. Considering that lightning is powerful enough to arc more than 12 miles across the sky, there is nothing that you can do to protect any electrical equipment against a direct strike other than to have appropriate lightning insurance.

Do not confuse a 'power strip' with a 'surge protector'. Often, surge protectors are located right next to power strips in the store and look very similar. Power strips merely add additional outlets while surge protectors provide electrical protection. Look for the words 'surge protection' on the packaging and purchase a well-known brand. Many high-end surge protectors offer insurance against damage to electronics if the surge protector fails to protect them. Buying the better model of surge protection doesn't cost much more and will give you peace of mind that your electronics have adequate protection.

Uninterruptible Power Supplies (UPS) are the best option for protecting most electronics. A UPS does three things:
- Conditions incoming power to help prevent minor power spikes and temporary power drops (brownouts) from damaging the electronics.
- Protects against major power surges with better protection than most surge protectors.
- Provides temporary battery backup in case of complete power loss. The duration of backup time varies by the type of UPS and the items that are plugged into it.

Most UPSs offer an insured guarantee should an electronics product be damaged by a surge.
CHAPTER 1: PRE-INSTALLATION

UPS (Uninterruptible Power Supply)
- 3 outlets: Back-up battery and surge protection.
- 3 outlets: Surge protection only.
- Power conditioning:

QMS PC

Input power:
Output power:

RS232
Opto Isolator

It is STRONGLY recommended to plug QMS PCs and monitors into UPS back-up battery/surge protection outlets. Minimum recommendation is to plug into surge protector power strip.

Q2010

Surge Protector Power Strip

WARNING: Diteks, opto isolators, UPSs, and surge protectors may not provide protection against severe power surges or direct lightning strikes.

CAUTION: Lightning or power surge can damage Ditek or opto isolator causing system problems until damaged parts are replaced.

NOTE: In areas prone to lightning and/or power surges, you should also plug other computers, FAX machines, copiers, and other office electronics into a UPS.

APPLICATION

There are several types of power risks to be aware of and protect against:

Brownouts or Power Sag are when the power at the wall outlet drops below 115VAC (in the United States). This can be due to the utility company reducing power due to load issues or it can occur when large appliances cycle on in an overloaded circuit.

Dirty Power occurs in some municipalities with antiquated or overloaded power grids. This is where the wall outlet power has consistent occurrences of small power spikes and brownouts. Dirty power is very damaging to electronics.

Blackouts occur when power is completely lost at the wall outlet. This can happen due to storms, damage to power poles and lines, or power grid problems. Blackouts are often followed immediately by power surges or brownouts when the power comes back on and large appliances cycle on.

Surges are large spikes of power over 120 VAC (in the United States). These can happen due to electrical storms, lightning strikes, and power grid problems. Surges can damage and sometimes destroy electronics.

Lightning can cause problems in multiple ways. Indirect strikes that do not actually hit the system can cause static discharge, disrupting electronics. Direct strikes can travel along any conductive metal, cable, or other material damaging everything in its path. Lightning is harder to deal with as it could come in on the power, data, or relay connections, or even through the conduit, building walls, or equipment cases.
CHAPTER 2: Q2010 INSTALLATION

Unpacking the Q2010
Installing the Q2010 Access Controller
Q2010 to Computer Connection
Q2010 to AI Device Connection
Output Relay Connections
Door Input Connections
Wiegand Input Connections
Power Connections (North America)
Power Considerations
Adding Additional Power Supplies

This chapter covers the basic installation of the Q2010 access controller as well as some of the basic connections on the Q2010 circuit board.
Unpacking the Q2010

The following items should be included in the Q2010 box. Unpack the box and verify that all items are present and ready for installation.

- **Q2010** – This is the base unit for the Q2010 system
- **RS232 Cable** – 50 foot cable to connect the Q2010 to the QMS computer on longer runs (up to 50 feet) between the Q2010 and the computer
- **USB Cable** – Cable used to connect the Q2010 to the QMS computer when they are close together (less than 16 feet). A shorter distance allows for faster communications
- **Power Cable** – 100 foot, 18 AWG, 2-Conductor cable used to connect the Q2010 to the transformer for power. This cable can be cut to the needed length
- **Spade Connectors** – These connectors must be crimped onto one end of the power cable to connect it to the transformer
- **Transformer** – Connected to the power cable using the enclosed spade connectors. The power cable is connected to the Q2010 and then plugged into power at the wall outlet
- **Battery** – Connected to the battery cables inside the Q2010 and used to power the Q2010 during short power outages
- **Keys** – Used to lock the Q2010 box after installation and setup are complete to prevent tampering

**REMEMBER**
Check all boxes of equipment shipped against the packing list to ensure that all items have been received prior to attempting the installation.
Installing the Q2010 Access Controller

The Q2010 access controller should be installed in a secure, interior area, such as a locking cabinet, room, or closet. Generally, this is in close proximity to the QMS computer. The location should have adequate ventilation and air conditioning. The Q2010 must be located in an accessible area for future maintenance.

1. Select a location on the wall approximately 5 feet above the floor. Conduit (at least ¾ inch) should be run from this area to the AI devices. A separate conduit (at least ¾ inch) should be run from this area to the computer if connection uses RS232 or Ethernet. If the computer interface connection is via USB, the Q2010 cannot be more than 15 feet from the computer and this second conduit is not necessary. The location should also have a dedicated electrical outlet nearby.

2. The mounting location for the housing should be at least 13” x 13” and allow room for the door to swing fully open to the left side of the housing as you are facing it. Wire in conduit can be run into the housing through one of two conduit knockouts in the back of the box or eight knockouts around the top, bottom, and sides of the housing.

3. Once the conduit locations are determined, place the housing against the wall and mark the wall through the four mounting holes on the rear of the housing using a pencil. Use a torpedo level to verify that the housing will be mounted level.

4. Double-check that the housing is level and that the location is correct. Set the housing aside and drill the four holes as marked. The surface that the housing is being mounted against will determine the type of drill, drill bit size, and type of anchors used. All anchors should be #8 and 1 ½ inch in length or longer, depending on the depth of the wall.

5. Once the housing has been anchored to the wall, connect the conduit to the box using compression fittings.

APPLICATION

There are eight knockouts on the Q2010 access controller for conduit connections. All are double-knockouts, which allow connection of 3/4 inch or 1 inch conduit fittings. If larger conduit is needed, the installer will have to drill a larger hole in the case.

CAUTION

Be aware of electrical and plumbing locations when drilling into the wall to prevent damage or injury.
**Q2010 to Computer Connection**

The Q2010 must be interfaced to a computer running QMS. This interface can be via USB, RS232, or Ethernet. USB allows high speed communication, but only for distances less than 15 feet. RS232 is slightly slower, but allows distances up to 50 feet. Ethernet allows connection up to 950 feet over a Local Area Network.

**For USB connections:**

1. Use the USB cable provided with the Q2010. Connect the smaller end of the USB cable to the USB port located on the bottom middle of the Q2010 circuit board.
2. Run the USB cable through a knockout on the Q2010 housing to the QMS computer.
3. Connect the larger end of the USB cable to a USB port on the back of the computer.

**For RS232 connections:**

1. Use the RS232 cable provided with the Q2010. Connect the end marked ‘controller’ to the RS232C port located on the bottom middle of the Q2010 circuit board.
2. Run the cable through conduit to the QMS computer.  
   **Note:** Unplug the connectors from this cable to allow the cable to be pulled through the conduit.
3. Connect the end marked ‘PC’ to the RS232 port on the back of the computer.

---

Do NOT connect the Q2010 to power at this point. Only connect power when instructed to during the installation steps on the following pages.
For Ethernet connections:

1. Make or purchase an Ethernet cable using CAT 5 Twisted Pair Network cable. Connect one end to the Ethernet port in the bottom right corner of the Q2010 circuit board.
2. Run the cable through conduit to the QMS computer.
3. Connect the other end to the Ethernet port on the back of the computer.

Connecting the Q2010 to the computer via Ethernet is the only point in the system when CAT 5 network cable is acceptable for use. NEVER use CAT 5 network cable for any other purpose in this system. Refer to Wire Needed in Chapter 1 for more information on the correct wire to use for various parts of the installation.
Q2010 to AI Device Connection

The Q2010 is connected to remote AI devices using RS485 communications through 18 AWG, 4-conductor wire. This wire should be run in conduit from the Q2010 access controller out to each AI device. AI devices include keypads, Wiegand proximity readers, single door expansion modules, and relay expansion modules.

1. Strip 2 inches from the end of the outside cable insulation and the foil shield exposing the individual conductor wires. Be careful not to cut any of the conductors or the shield wire.

2. Strip ¼ inch of insulation from the end of each of the individual conductor wires. Wrap electrical tape or heat shrink insulation around the bare shield wire, leaving only ¼ inch of the end bare.

3. Connect the wires to the AI devices terminal block in the bottom center of the Q2010 circuit board. Beginning at the first terminal slot on the left, insert the red DC + power wire. Use a small, flathead precision screwdriver to tighten down the terminal screw to firmly hold the wire in place. Verify that the wire is firmly held by tugging slightly on it. Verify that the terminal screw is tightened down on the bare copper wire and not the insulation, but make sure that there is no copper wire showing outside of the terminal block.

4. Repeat this process with the rest of the wires as follows:
   - Slot 1: Red DC +
   - Slot 2: Black DC –
   - Slot 3: White Data +
   - Slot 4: Shield Wire *
   - Slot 5: Green Data –

*The shield wire is bare inside the cable. It should be insulated using electrical tape or heat shrink insulation during the installation.
CHAPTER 2: Q2010 INSTALLATION

Notes on RS485

Remember, splices should be kept to a minimum. RS485 splices should be made using 3M U-Type connectors and crimpers only. It is better to pull a single new cable instead of splicing. See the Wire Splicing section in Chapter 1 for more information.

RS485 wire should not be run more than 4000 feet in a single run. Engineering specifications for RS485 recommend that the wire be run in series from the controller to the first AI device, then from the first AI device to the second, from the second to the third and so on. Due to site layout considerations, it may not be possible to go from one device to another in order. At times a second line must be run from the controller to a different section of the property. However, it is important to avoid star patterns in the wiring, where an individual cable is run to each AI device as this makes future service and troubleshooting almost impossible.
Output Relay Connections

There are four output relays along the top of the Q2010 circuit board. These four output relays can be used for many things, including controlling gate operators and doors, sirens, alarm shunts, lights, elevator controls, and virtual relays. These functions are programmed in QMS. Refer to the QMS Help Files for more information.

1. Each relay in the Q2010 system has three connection points: normally open, common, and normally closed. Refer to manufacturer instructions for the device you are connecting to determine if the connection is normally open or normally closed. A normally open connection will be wired to the normally open and common connection points. A normally closed connection will be wired to the normally closed and common connection points.

2. Output Relay 1 is defaulted as the gate operator relay in the QMS software. Relay 1 can be reprogrammed in QMS to almost any function to customize the site. To connect the gate operator to the relay, pull wire in conduit as recommended by the gate manufacturer from the gate operator to the Q2010 access controller. These two wires are usually 18 AWG or 16 AWG. Connect the end in the gate operator as per the gate manufacturer instructions. The other end of the wires will be connected to a relay connection in the Q2010, either at the Q2010 circuit board or on an AI device. If the connection has more than 30 volts running through it, connect the wires to a contactor block and connect this to the Q2010 system relay.
3. Output Relays 2 and 3 do not have default settings in QMS and can be used for almost any programmable relay function.

4. Output Relay 4 is defaulted as the siren relay in QMS. This can be reprogrammed in QMS to almost any relay function to customize the site. Connect the siren per the manufacturer instructions.

All relays are programmable and can be used for different functions based on the needs of the site.
Door Input Connections

There are eight door input relays on the Q2010 circuit board. Door Inputs 1 – 4 are on the lower left side of the board and Inputs 5 – 8 are on the lower right. The door inputs can be used for door alarm switches, request-to-exit switches, motion sensors, photobeams, presence sensors, and many other types of dry contact switches.

1. To connect Door Input 1, run the two wires from the switch into the Q2010 housing. Strip ¼ inch of insulation from the end of each of the individual conductor wires. Connect one of the wires to the first terminal slot marked Input 1. Connect the second wire to the second terminal slot marked Input 1, immediately below the first terminal slot. Use a small, flathead precision screwdriver to tighten down the terminal screw to firmly hold the wire in place. Verify that the wire is firmly held by tugging slightly on it. Verify that the terminal screw is tightened down on the bare copper wire and not the insulation, but make sure that there is no copper wire showing outside of the terminal block.

2. Repeat the process in Step 1 for each of the eight door inputs. Be sure that each set of wires is clearly marked so that it is easy to tell which door switch or other device it is connected to. This will be very important when programming QMS.

3. Once all of the door inputs have been connected, they must be programmed in QMS. Refer to the QMS Help Files for more information.
Wiegand Input Connections

There are two Wiegand device inputs on the Q2010 circuit board. These can be connected to most types of Wiegand output devices, such as proximity card readers, key fobs, remote door openers, etc. Refer to the QMS Help Files for more information on setting these up. The two Wiegand Inputs are commonly used to control a proximity reader controlling the entrance to the office where the Q2010 access controller is located or to control a proximity card reader at the desk that allows the proximity cards to be registered and assigned without going out to an AI device on the property.

There are generally 8 – 10 color-coded wires that connect to a Wiegand output device. These are connected to the Q2010 circuit board as necessary. Refer to the Wiegand device manufacturer’s instructions for wire color coding and connection assignments.

- +12V: Connection point for the + wire on 12VDC Wiegand devices
- +5V: Connection point for the + wire on 5VDC Wiegand devices
- Gnd/Shld: Connection point for – DC wire and for the Data Ground wire
- Data 0: Connection point for the Data 0 input wire
- Data 1: Connection point for the Data 1 input wire
- Grn LED: Connection for the optional Green LED entrance light wire
- Red LED: Connection for the optional Red LED access denial light wire
- Beeper: Connection for the optional beeper on entrance function wire
- Hold: Connection for the optional hold function wire
- Tmpr/CP: Connection for the optional Card Presence and/or Anti-tamper wire

Proximity Reader Wiegand Device shown for reference purposes only. Many types of Wiegand devices could be connected here.
Power Connections (North America)

Power connections can be made during initial set up to ensure that all electrical connections are working correctly, but power should be disconnected until all AI devices are installed and connected, and the system is ready for testing. Never try to install or connect wire while the power is connected to the system.

Connect the Transformer:

1. Lay out the power cable from the nearest outlet to the Q2010. Trim off excess cable, leaving a little extra length for service.
2. Strip back the power cable insulation 1.5 inches on both ends of the cable. Strip back the ends of both the red and black wires about $\frac{1}{4}$ inch.
3. Crimp the spade connectors to the end of the provided 100 foot power cable. Be sure that the copper wire makes good contact inside the spade connector and no copper wire is showing outside of the insulation.
4. Using a small screwdriver, screw the spade connectors onto the transformer.
5. Connect the other end of the cable to the AC In terminal slots inside the Q2010, using a precision screwdriver to tighten them down.

Connect the Ground Wire:

1. On the green ground wire coiled inside the case, strip back about $\frac{1}{2}$ inch from the end near the warning tag.
2. Connect a wire nut to the ground wire running to a copper grounding post or grounded water pipe as per local code.

Connect the Battery:

Do not connect the battery until the system is ready to be plugged in and tested, after all AI devices are installed and wired!

1. Slide the black negative battery wire onto the negative pole of the battery.
2. Slide the red positive battery wire onto the positive pole of the battery.
Plug in the Transformer:

Do not plug in the transformer until all AI devices are installed and wired and the system is ready to be plugged in and tested!

1. Remove the screw from the outlet wall plate and plug the transformer into the electrical outlet.
2. Use the screw provided on the transformer to screw the transformer and wall plate onto the outlet to prevent the power from accidentally being disconnected.
Power Considerations

The Q2010 has a built in 2 amp power supply. Each AI device that is placed on the line has current draw that must be accounted for in that amperage. Longer lines and more AI devices on the line will also cause the voltage to drop. Both voltage and amperage requirements must be accounted for.

Amperage Considerations

Use the chart below to verify that you have enough amps to support the number of AI devices to be installed. Do NOT exceed 75% of the rated load for the power supply. It is always better to have a higher amp power supply than required as electronics only pull the current that they need. Do not confuse amps with volts, which must not exceed the specifications.

<table>
<thead>
<tr>
<th>Power Supply Size in Amps</th>
<th>Actual Amperage / Milliamps (mA)</th>
<th>Max. Recommended Limit (75% Load) *</th>
</tr>
</thead>
<tbody>
<tr>
<td>2A</td>
<td>3A / 3000 mA</td>
<td>2250 mA</td>
</tr>
<tr>
<td>4 A</td>
<td>5 A / 5000 mA</td>
<td>3750 mA</td>
</tr>
<tr>
<td>10 A</td>
<td>10 A / 10000 mA</td>
<td>7500 mA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AI Device Type</th>
<th>Current Draw in Milliamps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q Access Keypad</td>
<td>300 mA **</td>
</tr>
<tr>
<td>Q Relay Expansion Module</td>
<td>500 mA</td>
</tr>
<tr>
<td>Wiegand Expansion Module **</td>
<td>300 mA **</td>
</tr>
<tr>
<td>Single Door Expansion Module</td>
<td>50 mA **</td>
</tr>
<tr>
<td>KT&amp;C Pinhole Camera</td>
<td>240 mA **</td>
</tr>
<tr>
<td>RB5 Relay</td>
<td>120 mA</td>
</tr>
</tbody>
</table>

* Do NOT exceed 75% load. This provides a safety zone to allow for most peak usage and power spikes/surges without locking up or damaging the system.
** When powering other equipment from these devices, be sure to consider the current draw specifications from that equipment as well. Refer to manufacturer specifications for verification on current draw.

Voltage Considerations

Voltage drop is a serious consideration when planning a site. Wire has resistance that reduces the available voltage the further along the line that it goes. Additional AI devices on the line also reduce the voltage. All Q2010 devices require a minimum of 12VDC to power them. If the power at a specific AI device falls below 12VDC due to a long length of wire with multiple AI devices on it, then the entire system can lock-up. Each AI device must receive at least 12VDC when the system is at full amperage load.
For this reason, always power sirens, maglocks, and door strikes from separate power supplies, never from the Q2010 or from a remote power supply connected to AI devices. Sirens, maglocks, and door strikes have significant amperage draw as they are initially powered up to sound or open. This can draw the system below 12VDC during this short period if they are connected to the same power supply as the rest of the system, resulting in system failure.

**Dealing with Amperage and Voltage needs**

While planning the layout of a system, you may find that the 2 amp power supply in the Q2010 is insufficient for the number of AI devices or for the wire length. Should this be the case, additional power supplies can be purchased and placed on the line as necessary. Refer to **Adding Additional Power Supplies** for more information.

**Battery Backup Calculation**

Battery backup time is equal to the current draw (amps) divided by the amp hour rating of the battery. For example: if the system draws 2 amps and the battery is rated at 4 amp hours; the battery backup should last for 2 hours if the battery is fully charged and all other conditions are right (4 ÷ 2 = 2). Certain external issues can influence this length of time, such as the age and condition of the battery, damage to the battery or power supply, power surges, and/or the level of charge in the battery. Also, each time the AI Device is used while the AC power is out will reduce the total backup time as the current draw increases slightly when the keypad is in use.

**Adding Additional Power Supplies**

Additional power supplies may be needed on a system due to amperage or voltage needs. The power supplies should be installed in conjunction with an RB5 Relay Module. Installation in this manner will allow the entire system to be reset from the Q2010 access controller.

Power supplies may be placed throughout the site as needed to prevent AI devices from falling below 12V at full load.

Power supplies should be mounted in an interior location that is accessible for future maintenance and service. As with all Q2010 equipment, including AI devices, the power supply should be mounted using the correct anchors for the surface. Power wires coming into and going out of the power supply housing should be run in conduit.

The diagrams on the next page show the correct wiring to be used when adding additional power supplies to a site.
Most AI devices require 12 - 18 VDC to function. Devices receiving less than 12 VDC will not operate correctly and may lock up the entire system. Devices receiving more than 18 VDC may be damaged or have a significantly shortened life.

As many power supplies as are needed can be added to the system by wiring in an RB5 relay at each additional power supply. This allows the reset button in the Q2010 to be pressed to reset the entire system from one location. This is helpful when resetting the system after maintenance, for troubleshooting, or after power loss.

Power supplies should be mounted in interior locations such as maintenance rooms. Never install a power supply inside an area that will be inaccessible for maintenance.

RB5 Relay is generally be mounted inside the power supply case that it controls.
CHAPTER 3: INSTALLING ACCESS CONTROL DEVICES

Mounting Access Devices
Installing Q Access Keypads
Installing Single Door Expansion Modules

This chapter covers the installation and basic programming of access control devices including keypads and Wiegand devices such as single door expansion modules.
Mounting Access Devices

The are several options for mounting access devices: surface mount, flush mount, box mount, and wall mount. Additionally, goosenecks and bollard provide additional mounting options.

Surface Mount Keypad

Q access keypads can be surface mounted to almost any wall. Surface mounting is generally used with door strikes and elevators. Mounting height is generally 48” – 58” from the finished floor to the center of the ‘5’ button on the touchpad.

Surface Mount Proximity Reader and Wiegand

Proximity readers can generally be surface mounted (refer to manufacturer instructions). The wire is run through the hollow wall or through conduit on the back of a solid wall up to a Wiegand board. The Wiegand board is either mounted above a drop ceiling or in a sealed/locked junction box. The proximity reader cable can also be run back to the Q2010 and connected to Wiegand connections there. Mounting height for the proximity reader is generally 48 inches from the finished floor to the center of the reader.

Mounting height for devices will vary with local code regarding handicap access, emergency and fire access, and other regulations.

Most standard installations will place the ‘5’ button on the touchpad at approximately 50 inches from the finished floor for walk up keypads and 45 inches from the finished driveway for standard vehicle access.

Refer to local code for specific guidelines on mounting height.
Flush Mount Keypad

Q access keypads can be installed using a flush mount box, which must be ordered separately. The flush mount is generally used in interior installations and allows the keypad to be set into hollow walls. Mounting height is generally 48” - 58” from the finished floor to the center of the ‘5’ button on the touchpad.

There is also an elevator flush mount made of brushed stainless steel for mounting inside elevator cars.

Box Mount Keypad

Q access keypads can be ordered with a mounting box that does not have a shaded overhang. This is generally used in locations that require a keypad to be mounted lower for handicap access. With a normal shaded keypad mount, a standing person may not be able to see the display. This special box mount must be ordered specifically. Mounting height varies from 42” - 58” from the finished floor to the center of the ‘5’ button on the touchpad.

Remember that exterior installations require the keypad to be sealed. The flush mount is intended for interior use but may be used on exterior applications if sealed with a silicone gasket provided by the installer.
**Gooseneck**

A gooseneck stand is most commonly used for driveways for vehicle access. Generally, the keypad should be protected with concrete bollards that prevent vehicles from hitting the keypad. It can also be used near doors for wheelchair access or when sidewalks and landscaping require a freestanding keypad mount away from the building.

**Wall Mount Gooseneck**

The keypad is mounted on a short gooseneck on a wall. This may be used for door strikes or for gates in driveways that run next to a building wall. A gooseneck can also be used to assist with wheelchair access to a device. Mounting height is 48” – 58” from finished floor to the ‘5’ button on the touchpad for walk up access and 45 inches from driveway level to the ‘5’ button on the touchpad for vehicular access.
CHAPTER 3: INSTALLING ACCESS CONTROL DEVICES

Single Bollard
A bollard is used as an attractive and functional stand for keypads. It helps protect the keypad from being struck by vehicles. It can be used in driveways for vehicle access or near doors as a decorative keypad stand. It can be painted any color to compliment the site. Mounting height is determined by the height of the pipe on which it is mounted.

Double Bollard
Similar in design to the single bollard, the double bollard is taller and has a second mounting point above the first to allow both cars and trucks or RVs to enter through the same gate without requiring drivers to get out of the vehicle to use the keypad. This design can also be used to mount a Knox Box for fire safety.

APPLICATION
Both single and double bollards are mounted on a Schedule 40, 10 3/4” diameter pipe with a .365” wall. This pipe is footed in concrete and filled 3/4 of the way with concrete to create a solid barrier. The entire pipe and bollard can then be painted to match the facility.
Installing Q Access Keypads

Following are instructions on installing a Q access keypad in connection with a Q2010 access controller. Refer to the Q Access Keypad Installation Guide that comes with each keypad for more information on programming the keypad after installation.

NOTE: Once it is determined where to install the keypad, the location and purpose of the device should be noted on a site security wiring plan that is kept in a safe location for future maintenance and service purposes.

1. Open the device by removing the four stainless steel button head machine screws on the front of the keypad case using the security hex key provided with the unit. The front and back half will separate.

2. Mount the back plate to the desired keypad location. Be sure to seal around the back of each screw hole and around the back of the wire hole with an outdoor silicone sealant. If the keypad is being mounted on a gooseneck or bollard, run a bead of silicone around all four screwholes. If the keypad is being mounted on a wall, before mounting, run a bead of silicone in a square around the back of the keypad about ½ inch from the edge.

3. Pull the necessary wires through the wire hole on the back of the housing. Allow an extra 1 foot of wire to remain inside the housing. After the wire connections are complete, any excess wire can be pushed back into the gooseneck or wall, or it can be carefully positioned inside the keypad housing. It is always better to have some extra wire for future maintenance and service.
Each Keypad should have the following wires:

- One 18 AWG, 4-conductor, shielded cable coming in from the Q2010 or from the previous AI device in line.
- One 18 AWG, 4-conductor, shielded cable going out to the next AI device in line (if there is another AI device down the line).
- One earth ground wire
- One or two 18 AWG, 2-conductor cable coming from the gate operator or door strike. *
- One RG59U video cable if a pinhole camera option is being used.
- One 18 AWG, 2-conductor cable for the presence sensor if it is being used.

* The cable to the door strike or gate operator will only be present if the relay inside the particular keypad is being used to trigger the door or gate. The Q2010 can be configured to use relays on the Q2010 circuit board, on a separate relay board, or on almost any other AI device to trigger a gate or door. For security reasons, the relay in the keypad nearest a door or gate should not be the one used to directly trigger the gate or door.

4. Strip back the outer insulation and shield foil from both of the 18 AWG, 4-conductor, shielded cables (coming from the Q2010 or previous AI device in line and going out to the next AI device in line), being careful not to cut the bare shield wire. Strip 1/4 inch of insulation off the end of each of the individual colored conductor wires.
5. Remove the terminal blocks from the keypad board by sliding them up and off. The terminal blocks may be somewhat difficult to remove as a tight electrical connection is necessary. If they are tight, rock them slightly back and forth while lifting away from the board.

6. Insert both red wires into terminal slot 1 on the first terminal block (P1). Ensure they are both seated all the way inside the slot. Use a flathead precision screwdriver to tighten down the terminal screw. Verify that the terminal slot has tightened down on the copper wire and not on the rubber insulation. There should be no copper wire showing outside of the terminal slot. Gently tug the wires to verify that they are tightly held inside the terminal slot. Repeat this process with each of the remaining wire connections as follows.

7. The right (relay) terminal block is used for the relay connections. Pins 1, 2, and 3 are for the first relay and Pins 4, 5, and 6 are for the second. If a gate operator or door strike is being triggered directly from the keypad, the wires will connect to two of the three pins on relay 1. Refer to the gate or door strike manufacturer’s instructions to determine whether it needs to be connected to the normally open and common or to the normally closed and common. Relay 2 can be programmed to serve a number of functions using both the internal programming and the QMS software. Refer to the Q Access Keypad Installation Guide and the QMS Help Files for more information on programming the extra relays.

8. The earth ground wire should be connected in situations where the keypad is mounted on (or in) a wall that is wood, stone, or other nonconductive material. When installing an elevator keypad or a flush mount keypad, earth ground must always be connected. It is not always necessary when the keypad is mounted on a bollard or gooseneck.
To connect the ground wire, run a copper wire from a grounded water pipe or a copper rod in the ground to the keypad and connect it to the green earth ground wire using a wire nut. This installation must meet applicable code as the type of wire, depth of burial, and size of the rod may vary by municipality.

9. If there is an optional pinhole camera in use, connect the video signal wire using RG59U video wire and BNC type connectors. Power for the camera is supplied by the keypad circuit board.

10. After all wiring is complete, gently push the excess wire back through the hole in the wall or gooseneck, leaving just enough slack to allow the keypad to be opened for service or maintenance. Seal the back wire hole with outdoor-rated silicone sealant and then screw the housing back together.

11. When the keypad is powered up, press the * 0 # buttons simultaneously to enter the setup function. The keypad will ask for a setup code. Enter 8898 and press the # button. Set the address for the keypad. This can be any number between 1 - 127. It must not match the address of any other AI device on the system. Generally, it is best to start with 1 for your first device and count up until each device has an address. Press # and set the baud rate. Generally, most systems will use 9600 baud rate. It is most important that the baud rates on every AI device match with the baud rate set in QMS. After setting the baud rate, press # and wait until the display goes back to date and time. Programming functions are covered in the Q Access Keypad Installation Guide that comes with each keypad.
It is extremely important to create a diagram of the site listing the locations of all equipment.

The installer should create and keep a copy of this location layout as well as leave a copy for the site.

There are many brands and types of Wiegand devices that can be connected to the Q2010. These include proximity card readers, key fob readers, pendant readers, fingerprint or palmprint readers, retinal scanners, vehicle ID tags, and more.

Each of these devices should have a Data 1, Data 0, 12VDC +, and Ground connection.

Other connection controls can also be used, such as LEDs (light emitting diodes), beepers, card presence detectors, and hold functions may be present.

Refer to the manufacturer instructions for more information.

Installing the Single Door Expansion Module

Following are instructions on installing a single door expansion module in connection with a Q2010 access controller. Refer to the Single Door Expansion Module Installation Guide that comes with each device for information on addressing and programming the device after installation.

1. Mount the two-gang box for the SDM. The two-gang box is generally hung on the wall behind the Wiegand reader or in the ceiling on the secure side of the door. Run all wires into this box. For ease of installation, use 1 or 2 screws to temporarily mount the SDM to the front of the two-gang box with the terminal block connectors facing out. Once all wiring is complete, turn the terminal block connectors around so that they face inside the box.

2. Mount the Wiegand reader or similar device on the exterior wall on the handle side of the door according to manufacturer instructions. Generally, the Wiegand reader should be mounted 48’ – 54” above the floor within 1’ – 2’ of the door handle. Pull the wires from the Wiegand device into the two-gang box.

3. Mount the door strike according to manufacturer instructions. Pull the control wires from the door strike into the two-gang box.

4. Mount a door alarm switch (if applicable) according to manufacturer instructions. Pull the switch input wires from the switch into the two-gang box.

5. Mount a request-to-exit switch, motion sensor, or photobeam (if applicable) and pull the wires into the two-gang box.

   NOTE: If wiring into multiple AI devices, insert both red wires into the first terminal slot 1 on terminal block P1. Ensure that the wires are seated all the way inside the slot. Use a flathead precision screwdriver to tighten down the terminal screw to firmly hold the wires in place. Verify that the terminal slot has tightened down on the copper wire and not on the rubber insulation. There should be no copper wire showing outside of the terminal slot. Tug the wires gently to verify that they are tightly held inside the terminal slot.

6. Pull the necessary wires through conduit to the housing. Each device should have the following wires:

   • One 18 AWG, 4-conductor, shielded cable coming in from the Q2010 or from the previous AI device in line.
   • One 18 AWG, 4-conductor, shielded cable going out to the next AI device in line (if there is another AI device down the line).
CHAPTER 3: INSTALLING ACCESS CONTROL DEVICES

- One 18 AWG, 2-conductor cable coming from the door strike or maglock controlled by the device. *
- One cable coming from the HID proximity reader, fingerprint reader, or other Wiegand output device.

* The cable to the door strike or gate operator will only be present if the relay inside the particular keypad is being used to trigger the door or gate.

7. Strip each wire back ¼ inch and connect all wires. Use a precision screwdriver to tighten each connection, making sure that no bare copper wire is left out of the terminal holes that might contact other wires or the board. Insulate any shield and ground wires with electrical tape or electrical heat shrink tubing.

8. Set the address using dipswitches 1 - 7 on the SDM circuit board. The address must be between 1 - 21 or 23 - 127 and must not be the same address as any other device connected to the controller. Address 22 cannot be used.

9. Set the device for preset or configurable mode using dipswitch 8. For the preset mode, the most common setting, leave dipswitch 8 turned off. For configurable programming mode, turn on dipswitch 8 and connect to HyperTerminal for programming.

10. Set the jumper (J1) for the power requirements for the Wiegand device. Connecting the jumper to the right two pins passes through the same power voltage as is coming into the board on P1 pins 1 and 2. Connecting the jumper to the left two pins changes the voltage to 9V output to the Wiegand device.

11. Turn the board around and mount in the two-gang box with the wires and terminal blocks on the inside. Cover the board with a foam insulator and mount the faceplate on top.

The baud rate for Wiegand boards manufactured after August 2005 is 9600 and all AI devices on a system with one of these boards must be set to 9600. Boards manufactured prior to this date could be set to 1200 or 9600. A baud rate of 9600 should always be used with the Q2010 and QMS system.

The Terminating Resistor (Dipswitch 1) should never be turned on. This is only used in very rare cases of signal reflection on a line and would only be turned on at the AI device that is furthest in wire distance from the Q2010. If this is turned on at more than one AI device or on a healthy system with no signal reflection, it can actually cause communications problems.
CHAPTER 4: INSTALLING THE Q RELAY EXPANSION MODULE

Installing the Q Relay Expansion Module
Relay Applications: Secure Interior Relay
Relay Applications: Alarm Shunts
Relay Applications: Elevator Controls
Relay Applications: Lighting Control Areas

This chapter shows how to install a Q relay expansion module for use with secure interior relays, alarm shunts, elevator controls, and lighting controls.
Installing the Q Relay Expansion Module

Following are instructions on installing the Q relay expansion module in connection with a Q2010 access controller. Refer to the Q Relay Expansion Module Installation Guide for more information on programming the device after installation.

The Q relay expansion module should be installed in an interior location that is secure from tampering. It can be mounted on a wall in a locking junction box, alarm room, security room, elevator room, above a drop ceiling, or other secure location. It should never be installed in a location that will not be available to future access for maintenance or service. Once it is determined where the device is to be installed, the location and purpose of this device should be noted on a site security wiring plan that is kept in a safe location for future maintenance or service.

1. Open the housing by removing the two stainless steel button head machine screws on the front of the housing using the hex key provided with the unit. The faceplate will slide down and off.

2. Mount the back plate to the desired location using the four holes.

3. Pull the necessary wires through conduit into the housing. Each device should have the following wires:
   - One 18 AWG, 4-conductor, shielded cable coming in from the Q2010 or from the previous AI device in line.
   - One 18 AWG, 4-conductor, shielded cable going out to the next AI device in line (if there is another AI device down the line)
   - One earth ground wire
   - Up to eight 18 AWG, 2-conductor cables coming from the gate operator, door strike, elevator, lighting zone, or other relay controlled device.

* The 8-channel relay expansion module can be used to control elevators on a building with up to 9 storeys, 8 lighting zones, up to 8 secure interior relays, or any number of other relay functions that can be programmed in QMS.

It is extremely important to create a diagram of the site listing the locations of all Equipment. This becomes most important with devices like the 8-channel relay expansion module, as it is often hidden in a junction box, in a utility closet, or above a drop ceiling. The entrance gate keypad will be very obvious when for troubleshooting, maintenance, upgrade, or expansion. A device like a relay board quickly becomes forgotten and can cause problems if additional devices are added later with the same address.

The installer should create and keep a copy of this location layout as well as leave a copy for the site.
4. Strip back the outer insulation and shield foil from both of the 18 AWG, 4-conductor, shielded cables (coming from the Q2010 or previous AI device in line and going out to the next AI device in line), being careful not to cut the bare shield wire. Strip 1/4 inch of insulation off the end of each of the individual colored conductor wires.

5. Remove the terminal block (TS1) from the keypad board by sliding it up and off. The terminal block may be somewhat difficult to remove as a tight electrical connection is necessary. If it is tight, rock it slightly back and forth while lifting away from the board.

6. Insert both red wires into terminal slot 1 on the terminal block (TS1). Make sure that they are both seated all the way inside the slot. Use a flathead precision screwdriver to tighten down the terminal screw to firmly hold the wires in place. Verify that the terminal slot has tightened down on the copper wire and not on the rubber insulation. There should be no copper wire showing outside of the terminal slot. Tug the wires gently to verify that they are tightly held inside the terminal slot. Repeat this process with each of the remaining wire connections as follows.

7. The terminal strip along the top right of the board has eight relays. From left to right, the first three pins are Relay 1; the next three are Relay 2, etc. Each relay connection consists of a normally open (NO), common ground (CG), and normally closed (NC) contact. Whether you use the NO or NC connection will depend on the device that you are using. Refer to manufacturer instructions for more information.

**APPLICATION**

Below are some common uses for the 8-channel relay expansion module. More information about each of these can be found at the end of this chapter.

- **Secure Interior Relay:** For higher security situations, the relay that controls a door or gate should not be in the keypad that is used to open that door or gate. This prevents someone from breaking into the keypad and jumping the relay wires. This is also recommended by UL.

- **Elevator Controls:** Control access to the second floor to only those people with units on that floor. An 8-channel relay expansion module can control an 8 or 9 storey building (because the first floor can be accessed by anyone).

- **Lighting Zones:** Save money on expensive lighting bills by turning off the light when no one is in that building or on that floor. When a user with permission to enter an area comes onto the site, the lights come on for them. The lights then go off when they log off the site.

---

**Terminal Block TS 1**

1. Red DC+ *
2. Black DC - *
3. Earth Ground if applicable.
4. White Data +
5. Shield **
6. Green Data -

* If using AC power, place the AC wires in slots 1 and 2. However, 12-18VDC is recommended.

** Shield wire should be insulated with heat shrink or electrical tape.
8. The wires for each relay should be punched down on the terminal strip using a mux punchdown tool. Do NOT use a screwdriver, knife blade, or telephone punchdown tool. To punch the wires down, remove the terminal strip by gently rocking it back and forth while pulling up and away from the board. Place the terminal strip on a hard surface and place the wires over the correct slots.

9. Use the punchdown tool to firmly press the wires in place. There is usually an audible click as the wires seat down all the way.

10. Once all wires are punched down, use electrician’s shears or wire cutters to trim the excess wire from the back of the terminal strip. Then push the terminal strip back onto the pins.
11. The Q relay expansion module also has eight additional door alarm inputs. These can be used to monitor door switches, motion sensors, photo beams, or almost any other type of alarm switch. The terminal strip located in the middle right of the board, below the relays, is the inputs. From the left to the right, the first slot is channel 1 and the second slot is common ground. The third slot is channel 2 and the fourth is common ground. This repeats with every other slot representing another channel. Punch down the door input wires using a process similar to steps 8, 9, and 10.

12. After all of the wires are connected, the unit must be programmed with address and baud rate. Slide the dipswitches as necessary to create any address from 1 - 31 by adding the numbers on dipswitches 1 - 5. As with other AI devices, the address must be unique with no duplication. The baud rate is set on dipswitch 6. This should always be 9600 and must match all devices. Once all wiring is complete, slide the faceplate back onto the housing and screw it back together.

<table>
<thead>
<tr>
<th>Dipswitches</th>
<th>OFF</th>
<th>ON</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Address</td>
<td>Address + 0</td>
<td>Address + 1</td>
</tr>
<tr>
<td>2 Address</td>
<td>Address + 0</td>
<td>Address + 2</td>
</tr>
<tr>
<td>3 Address</td>
<td>Address + 0</td>
<td>Address + 4</td>
</tr>
<tr>
<td>4 Address</td>
<td>Address + 0</td>
<td>Address + 8</td>
</tr>
<tr>
<td>5 Address</td>
<td>Address + 0</td>
<td>Address + 16</td>
</tr>
<tr>
<td>6 Baud Rate</td>
<td>9600</td>
<td>1200</td>
</tr>
<tr>
<td>7 Not Used</td>
<td>Not Used</td>
<td>Not Used</td>
</tr>
<tr>
<td>8 Not Used</td>
<td>Not Used</td>
<td>Not Used</td>
</tr>
</tbody>
</table>

The relay board is often installed before the controller. Following is a simple way to test the relays before the board is connected to the rest of the system.

Wire up the relays as required for the site. Then, connect a 9V battery to the battery connection at the bottom of the board next to the terminal block. The board can then be tested even before communications are established with the controller.

The relays can be activated by using the keyswitch attached to the case. This switch activates all relays simultaneously. This can be used to trigger the relays in case of emergency or to test the system. This switch could also be wired manually to a switch in the office or security center to allow emergency activation of all relays.
Relay Applications:

Secure Interior Relays

Secure interior relays are recommended for any UL setup as well as for high security installations. The keypad (or other access device) is located outside the secured area to allow the customer to enter their code for access. However, QMS is programmed to trigger the relay inside the relay board or the Q2010 to actually open the secured door or gate. The relay inside the keypad or other access device is not used. This prevents someone from opening the keypad and placing a jumper over the relay wires to gain access.

Secure Interior Relay - Q2010

Many AI devices are rated up to 30VDC at 5A. Any higher voltages must be run through a contactor block which is then controlled by the relay. A contactor block is just a stronger relay to handle higher voltages. The relay switches the contactor block on and off. When switched on, the contactor block acts as a relay to switch on and off whatever is connected to it. This is most often used for lighting controls and sirens, but may also be used for gates, door strikes, elevator controls, or just about any other device that can be controlled by a relay and is switched with more than 30VDC.

An example of a contactor block is shown. There are many brands of contactor blocks available at your local electrical supply. Note: high voltage connections should only be wired by a licensed electrician.

Contactor Block

NOTE: RUN CABLES THROUGH HOUSING KNOCKOUT/CONDUIT BEFORE WIRING TO BOARD.
Secure Interior Relay - Q Relay Expansion Module

Relay Applications:

Alarm Shunts

Alarm shunting is used to allow exit from a specific alarmed door or through an area covered by motion sensors by holding the relay for a certain amount of time. This allows you to set a door alarm, photo beam, or motion sensor while inside the zone and still be able to exit the zone without triggering the alarm. The alarm will then be set after the preset relay time has run out.
Alarm Shunt - Q2010

Elevator controls are subject to local fire and safety regulations. It is important that the ground floor is never controlled. This allows customers on any other floor to return to this floor at any time. Also, stairwell access should be limited. Customers should be able to exit into a fire stairwell from any floor but not access other floors from the stairwell. Refer to local fire codes for specific requirements in your municipality.

Relay Applications:

Elevator Controls

The Q2010 can be used to control elevator floors to limit access only to allowed floors. The keypad or proximity reader is placed immediately outside the elevator or inside the elevator car. The elevator buttons will not function until the user inputs a valid access code. Then, only the button(s) to the floor(s) the user has access to (and return to the first floor) will become operational.
CHAPTER 4: INSTALLING 8-CHANNEL RELAY EXPANSION MODULES

Elevator Control - Q2010

Remember that, in most cases, elevator connections must be made by the elevator installer. It is important to plan ahead to have the elevator installer present to install and test these connections.

Elevator Control - Q Relay Expansion Module

NOTE: RUN CABLES THROUGH HOUSING KNOCKOUT/CONDUIT BEFORE WIRING TO BOARD.

CONNECT ONE WIRE FROM EACH CABLE TO "C" AND THE OTHER TO "NO" OR "NC" AS REQUIRED PER ELEVATOR SPECIFICATIONS.

NOTE: RELAYS 1 & 2 SHOWN FOR REFERENCE. RELAYS 3 THRU 8 ARE USED FOR FLOORS 4 THRU 9, RESPECTIVELY.
Relay Applications:

Lighting Control Areas
Lighting area relays control the lights in a building. This conserves energy by keeping the lights off when no one is in that area. The lights turn on automatically when someone enters a valid code for the area and turn off again after they leave. Programming for this feature is covered in the QMS Help Files.

**Lighting Controls - Q2010**

**REMEMBER**
High voltage connections require a licensed electrician in most municipalities. Be sure to plan in advance to have the electrician present to perform these connections and assist with testing.

**REMEMBER**
Remember that high voltage lights will require a contactor block for the relay connections when using low voltage relays rated to handle only 30VDC at 5 amps.
CHAPTER 5: TROUBLESHOOTING

Troubleshooting Concepts
Troubleshooting Gates
Troubleshooting Access Devices

This chapter covers basic troubleshooting for the Q2010. It is by no means an exhaustive troubleshooting manual. All installation, troubleshooting, and service should be performed by a trained and qualified technician.
Troubleshooting Concepts

Troubleshooting, like detective work, involves taking a number of clues or symptoms and following them back to a logical conclusion. This process can be very difficult if the installer skips steps or assumes answers. The technician must be careful, methodical, and thorough when troubleshooting. Follow the steps below to begin the troubleshooting process. Keep notes throughout the process detailing what steps have been taken and the results that have been seen. Write down system messages, error messages, multimeter readings, AI device addresses, AI device functions and locations, etc.

To make troubleshooting easier, you should have a good installer/service company do the initial install and keep a thorough set of records about the system that include: a site map showing the location of all equipment and wiring, a list of AI devices with functions and locations, regular backups of data from all software, copies of all manuals, all software disks, and contact information for the installer and responsible personnel.

Begin troubleshooting by asking the question: “Was the item working in the past or has the problem been there since it was installed?” It is important to be very honest at this point. Generally, if something has been installed for awhile, it probably worked at some point. The trick is to find out when it stopped working and why.

If the item is newly installed and the problem has been present since the beginning, carefully go back over every part of the installation process. The following sections will detail the troubleshooting steps for specific items.

If the item worked when it was first installed, ask “What has changed at the site that may have caused the problem?”

Examples include:

- Construction/electrical work on-site or in the area
- Change made to the system
- New computer component added (PDA, printer, hard drive, etc.)
- New employee operating the system
- Furniture moved (pinching wires/pulling wires)
- Power interruptions or surges (blackouts or brownouts)
- Lightning strike or electrical storm
- Vandalism or other physical damage
Ask other pertinent questions, such as:

- Was the system working previously?
- When did the problem first occur?
- When and how did the problem first get noticed?
- What was happening immediately before the problem occurred?
- How often does the problem occur?
- Does the problem occur at certain times or in certain areas?
- Does the problem affect everyone or just certain individuals?

Check all wires and cables in the vicinity of the system. Verify that all cables are actually plugged in, that all connections are tight, and that no wires are pinched, crushed, or cut.

Try to reset the system. Locate the Q2010 access controller and press the reset button in the upper left of the circuit board. Hold the reset button in for at least 60 seconds. Large sites with more AI devices may require the button to be held in for a longer time period to be sure that every AI device is reset. Once the button is released, watch the QMS event log to verify that each device comes back online in numeric order by address.

Verify that the system is working and that all AI devices are functioning correctly. If the problem has gone away, monitor the situation for a few days. If the problem reoccurs, repeat these steps and compare notes to try to find a pattern. If the problem persists, try the troubleshooting steps on the following pages.
Troubleshooting Gates

**Warning:** Installing and troubleshooting gates should only be done by trained service technicians due to the dangers of injury, death, and property damage from electrocution, and the possibility of crushing, breaking, or severing of limbs from moving parts. All gates should be installed and serviced by trained professionals and meet all local, state, federal, and UL guidelines and safety regulations.

Most gate problems occur due to a lack of maintenance or improper maintenance. Gates should be regularly serviced by a trained service technician. A regular routine of service and maintenance should be planned for in the budget and scheduled throughout the years. Typical maintenance tasks that should be performed on gates include:

- Oil and grease gates with the recommended lubricants.
- Clean parts using the proper solvents.
- Inspect wheels, gears, chains, and other moving parts for wear or damage and replace immediately if necessary.
- Tighten and adjust the chain regularly.
- Keep weeds and rocks away from the chain and gate path.
- Keep track free from debris and in good working order (unbroken, and not lifting up or bending).
- Check the set screws and adjustment nut regularly.
- Test loops, beams, and sensor edges regularly and immediately replace or repair them if not working correctly.
- Keep children away from the gate to prevent injury or death.

If there is a problem with the gate opening or closing, try a code or card at the AI device controlling the gate to see what happens. Be sure the code or card is one that is known to be working.

If the gate closes on vehicles or people, immediately open the gate using a manual override or block access to the gate to prevent property damage, injury, or death. Then, contact a gate service company to come and repair the gate.

If the gate does not open at all, refer to Troubleshooting Guidelines for Access Devices.

If the gate stays partway open or closed, contact a gate service company to service the gate.

If the gate is slow, sticking, or hesitating, contact a gate service company to service the gate.

If the gate opens and stays open, check the relay settings in QMS, the hold open times in QMS and in the keypads, or contact the gate installer to ensure that the safety features aren’t holding it.
Troubleshooting Access Devices

Use the following troubleshooting steps for access devices including Q access keypads and single door expansion modules. Remember to keep a good set of notes as you troubleshoot. This can help to compare to find problems, prevent confusion, and help speed things up if site service by a technician is required.

Try a code or card at the AI device controlling the gate. Be sure the code or card is one that is known to be working at that location and time. It is a good idea to try several codes. Note which code was tried and what the message response at the device is as well as the message response on the QMS event log.

Try the same code(s) or card(s) at other access devices on the property. Compare the result with the previous step. Try to narrow down whether multiple devices are affected or just one.

If the problem is narrowed down to one device, it must be determined if the problem is in the device or the location. Make sure to allow for access and egress of customers and then remove the device in question. Switch it with another similar device that has been proven to be working in the previous step. For example, if the entrance keypad isn’t working, but the exit one is, then switch the two. Be sure to switch the addresses also. If the problem stays in the same location, it is probably a wiring issue. Contact a service company to check the wiring.

If there are multiple problems or ongoing issues, the process in the previous step can be performed for an entire site. Generally, multiple problems are a sign of problems in the wiring, either from bad splices, pinched or nicked wires, radio frequency interference, water in the conduit, or incorrect wire type. To check an entire site, make sure to allow for access and egress of customers and then go to every AI device on the site, opening the housings and unplugging the power and data terminal blocks. When every device on the site is unplugged, add one device back into the system at a time. Allow that device to function for an hour and then add in the next device in line. Eventually, a device will be added that causes the problem to manifest. Switch this device with one that has been previously added to verify if the problem exists in the location or in the device.

Verify that all devices are receiving enough power. Create a voltage map of the site by sketching out the site with the locations of every AI device. Use a multimeter to take DC power readings at each device. Note these readings on the sketch. Any device that is receiving less than 12V is underpowered and can cause the entire system to lock up.
This chapter contains important notices, warnings, useful information, and a site maintenance history. It also contains a glossary of terms and an Index.
Notices, Disclaimers, and Warnings

We strongly recommend that installation and setup of LiftMaster equipment be done by a certified, licensed, qualified, and competent technician. It is up to the customer to verify an installer’s qualifications and negotiate any pricing or contracts. With any computer set up or installation, some troubleshooting and adjustment of the configuration may be required. This will differ with every installation and computer setup depending on operating system, software installed on it, quality of components, internet connection, modem connection, and any site-specific variables. This troubleshooting and configuration may include purchasing additional equipment. In no circumstances will LiftMaster be responsible for any damages either incidental or consequential based on these recommendations. All installation of electronics and electrical systems must be in compliance with local, municipal, and state codes, and the National Electrical Code.

Installation of equipment must be performed per recommended procedures except where local, municipal, or state codes, or the National Electrical Code and Construction codes take precedence. When code and our guidelines do not cover a given situation, it is the responsibility of the Dealer/Installer to follow established custom and best practices applicable to the particular trade. Dealers and Installers must know and abide by all existing laws pertaining to their work.

The user should follow all installation, operation, and maintenance instructions. The user is strongly advised to conduct product and systems tests at least once each week. Changes in environmental conditions, electric or electronic disruptions, and tampering may cause the product to not perform as expected.

Reliable equipment operation is dependent upon noise free uninterrupted sources of power. The Q2010 battery backup feature is provided primarily to preserve the integrity of the memory database and operation of the Q2010 system. This will not guarantee operation of the gate motor or door actuator for emergency situations in the event of a power loss or equipment failure. It is the sole responsibility of the purchaser to provide for and facilitate manual nonelectrical emergency means of exit in the event of a power failure. Contact your local dealer/installer for options and availability.
This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with this manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference; in which case the user at his/her own expense will be required to take whatever measures may be required to correct the interference.

This manual and all documentation belong to the User and must be given to them by the dealer or installer immediately after installation. These items should be retained on-site by the user.
System Requirements

NOTE: If you are using any other software along with ours, it is imperative that you ensure that your computer specifications more than exceed the combined total requirements for all of the software loaded on the computer.

Computer Requirements

These computer requirements are the minimum for running the software by itself.

- Pentium 4, 1.4GHz or higher processor
- 512 MB RAM (1G RAM or higher recommended)
- 4+ GB available hard drive space
- CD ROM (with high capacity storage, such as a CD-RW or DVD-RW, available for backups)
- SVGA monitor (800 x 600 resolution minimum)
- Sound card and speakers recommended
- Two or more available working ports [RS232 port(s), USB port(s), or Ethernet TCP/IP port(s)]
- Broadband/high-speed business internet connection (cable, T1, or DSL), always on connection
- Keyboard and Mouse
- A high quality Laserjet or Inkjet printer (for printing Reports)
- Remote access software for technical assistance. To receive technical support, you MUST have a remote access software installed on your PC.
- Anti-virus software such as McAfee Virus Scan, Symantec's Norton Antivirus, or other major brand.
- Firewall protection is strongly recommended (ensure settings do not interfere with other applications running on the system). Firewall should be configured by a knowledgeable computer tech.
- Uninterruptible Power Supply (UPS) power backup and surge protection is recommended. (Part # PPWRUPSAPCBP350).
Operating System

  or Microsoft Vista, 32-bit* with Service Pack 1. (All necessary updates and
  service packs for Windows should be loaded on the computer before beginning
  installation.)

* Not all operating systems support all software and some third party products (such as card scanners, cameras, or other peripherals) may not function with some operating systems and/or computers (i.e., 64-bit operating systems may not support peripherals built for use on 32-bit or earlier platforms). Refer to the product manufacturer’s documentation for compatibility information with the operating system in use. Chamberlain Access Solutions is not liable for the functioning or reliability of any third party products and any products recommended are only done so based on historic examples of them working with our product. Chamberlain Access Solutions cannot guarantee any third party product compatibility or their continued functionality. Future releases, updates, upgrades, or other modifications to these products may affect their compatibility with Chamberlain Access Solutions products or with other programs on your computer. We recommend that your computer and network be regularly updated and maintained by a qualified information technology technician.

Site Graphics Requirements

The computer on which the Site Graphics software is running must include the computer requirements previously listed as well as the following.

- PTI Graphics Serial Adapter (Part # PGRASIA)
- 16 MB Video Card or higher
- 1024 x 768 resolution minimum (Large screen monitor recommended)

QMS Software

The following is recommended for operation of the software.

- Direct X compatible camera

Proximity Cards / Photo ID Badges / Swipe Cards

The following items are recommended for the operation of peripheral devices.

- Compatible Wiegand interface cards for proximity devices
- Any 4-line magnetic stripe card for use with swipe reader devices
- Preprogrammed blank or logo-imprinted cards can be purchased from Chamberlain Access Solutions for either device type
Access System Controller Requirements

The following items are required for the operation of the Q2010 controller.

- QMS software, version 2.2.1710 or newer
- USB, RS232, or Ethernet connection
  - USB Connection—maximum length 15 feet
  - RS232 Cable Connection—maximum length 50 feet
  - Ethernet Cable Connection—maximum length 950 feet
- Electrical outlet providing 120VAC (United States) or 240VAC (Europe or Australia)
- Europe or Australia

We strongly recommend that installation and setup of all computers and any Chamberlain Access Solutions equipment be done by a certified, licensed, qualified, and competent technician. Chamberlain Access Solutions can recommend local dealers and installers, but it is up to the customer to verify their qualifications and negotiate any pricing or contracts unless Chamberlain Access Solutions has been specifically contracted in writing to do so for the customer. The above information represents recommended minimum guidelines. These guidelines are subject to change without notice. With any computer setup or configuration, some troubleshooting and adjustment of the configuration may be required. This will differ with every computer setup depending on operating system, software installed on it, quality of components, internet connection, modem connection, or any other variable introduced into the setup. This troubleshooting and configuration may include purchasing additional equipment. In no circumstances will Chamberlain Access Solutions be responsible for any damages either incidental or consequential based on these recommendations.

Computers running any Chamberlain Access Solutions hardware, software, or utilities must meet our computer requirements. These computer requirements are intended as a minimum guideline for operating our access control system. If a customer intends to add third party peripherals to the system, they are responsible for ensuring that the products are compatible with the access control system they have installed.

PTI, Falcon XT™, StorLogix™, QMS™, TaskMaster™, PayXpress™, Site Graphics™ are trademarks of Chamberlain Access Solutions. All rights reserved.

Microsoft Windows, Pentium, pcAnywhere, Symantec, Norton, McAfee, are all registered trademarks of their respective companies.
The following pages contain several forms that may be useful for the site. We recommend that the Equipment Location and Site Closeout Checklist forms be used for most sites. These forms may be copied and used for any product connected with the Q2010.

### List of Forms

<table>
<thead>
<tr>
<th>Form</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment Location</td>
<td>This form, along with a wiring map of the site, should be kept on-site with this manual. The dealer should also retain a copy in their customer files.</td>
</tr>
<tr>
<td>Site Closeout Checklist</td>
<td>This form is a tool to protect both the end user and the dealer. The dealer and an authorized representative of the site should walk the property while reviewing the checklist to verify that all items are installed correctly and working properly. Both parties should sign off on the checklist and keep a copy. This list may not be comprehensive to all of the work that the installer may have performed on the site, therefore, be sure to check all work.</td>
</tr>
<tr>
<td>Service History</td>
<td>This form should be completed at installation and updated anytime service is performed on the system. This includes, regular maintenance, troubleshooting repairs, and future additions or upgrades.</td>
</tr>
<tr>
<td>Dealer/Servicer Contact Information</td>
<td>This form should be filled out by the dealer/installer at the completion of the project. This will help the client know who to call for service, maintenance, or future additions.</td>
</tr>
</tbody>
</table>
# Equipment Location

Site Name: ___________________________ Date of Install: ________________

Site Address: _______________________________________________________

<table>
<thead>
<tr>
<th>AI Device Type</th>
<th>Location on Site</th>
<th>AI Device Address</th>
<th>Purpose of Device</th>
<th>Notes/Other Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Make additional copies of this form if more space is needed.
Site Closeout Checklist

Site Name: ___________________________ Date of Install: ________________
Dealer/Installer: _________________________________________________________

Following is a list of the major functions of the installed Q2010 system. The installer and a representative of the site should review each item and verify functionality. Each item in the categories below should be checked as it is verified in working order. Then the form should be signed at the bottom by the Installer and a representative of the site. Do NOT check off any item that is not fully functional! Cross out any item that is not applicable and write ‘N/A’ next to it. This form should be completed and signed prior to final payment to the installer.

Access Control System:

☐ Time and Date correct at every Keypad, Single Door Expansion Module, Relay Expansion Module, and Wiegand Expansion Module.
☐ Verify hours and remotes are correctly setup for every Access Level in QMS.
☐ Sample code for each Access Level works to access property during correct hours.
☐ Sample code for each Access Level allows access only to remotes and/or elevator floors available to it.
☐ Sample code for each lighting area activates correct lights for that zone.
☐ Each Keypad opens only the device(s) it is assigned to.
☐ If using DC door strike(s), a diode has been placed across the positive and negative per specifications.
☐ Verify that each Gate or Door relay can be manually activated from QMS.
☐ Verify that all relay times are correct for each device.
☐ Print and attach a copy of each of the following reports from QMS:
  • Access Area Configuration
  • Access Level Configuration
  • AI Device Configuration
  • Alarm Zone Configuration
  • Custom Messages
  • Elevator Configuration
  • Holidays Configuration
  • Input Configuration
  • Lighting Area Configuration
  • LogixScript
  • Q2010 Configuration
  • Relays Configuration
  • Time Schedule Configuration
Door Alarm System:
- Open and close every alarmed door on-site in sequential order. THIS STEP IS VERY IMPORTANT and can be performed ahead of time and proven by the next step below.
- Print a ‘Site Activity by Date’ for today’s date showing each door opening and closing in sequential order with no mistakes. This cannot be faked in the system and will demonstrate that all doors are correctly working. Attach a current copy of this report.
- Verify that when a door is opened without entering a code, the siren sounds for the correct time.
- Verify that when a door is opened without entering a code, the siren is stopped and every door returns to alarmed normal status when Alarms are Cleared in QMS.

Video System:
- Verify that each camera is in focus and can be clearly viewed at monitors.
- Verify that each camera is adjusted to cover the area assigned to it.
- Verify that each camera is sealed properly.
- Verify that each monitor is functioning correctly.
- Verify that the time, date, and camera descriptions are input for each camera in the DVR.
- Verify that video is recording at correct speed, frames-per-second, resolution, and picture size.
- Verify that video plays back and that rewind, fast forward, and search functions work.
- Verify the motion detection zones and settings if applicable.
- Verify that VideoViewer can be brought up and used in QMS.
- Verify that events clicked in EventViewer bring up the correct camera view assigned.

Office Security Alarm:
- Verify that each zone is setup correctly.
- Verify that each zone arms and disarms correctly.
- Verify that the siren is functioning properly.
- Verify that access codes and master codes can be changed properly.
Other Items:

☐ ______________________________________________________________________

☐ ______________________________________________________________________

☐ ______________________________________________________________________

☐ ______________________________________________________________________

☐ ______________________________________________________________________

☐ ______________________________________________________________________

☐ ______________________________________________________________________

☐ ______________________________________________________________________

☐ ______________________________________________________________________

☐ ______________________________________________________________________

☐ ______________________________________________________________________

Date of Closeout:____________________________

Installing Company Signoff:

By signing below, I acknowledge that the above systems have been installed correctly and are functioning properly. I certify that the installation meets all applicable codes and is installed to LiftMaster’s specifications except where code takes precedence. I certify that a representative of the site has been trained in the maintenance and operation of the systems.

______________________________
Signature of Installer           Date

______________________________
Printed Name of Installer      Title

Site Representative Signoff:

By signing below, I acknowledge that all items checked on the above signoff list are functioning properly and the installation is acceptable.

______________________________
Signature of Site Owner or Site Owner’s Representative        Date

______________________________
Printed Name of Site Owner or Site Owner’s Representative    Title
Site Service History

Complete this form each time installation, service, or maintenance is performed on the system. This history can be very useful in problem-solving if issues arise.

<table>
<thead>
<tr>
<th>Date</th>
<th>Servicing Company</th>
<th>Name &amp; Phone Number of Tech</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services Performed:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Servicing Company</th>
<th>Name &amp; Phone Number of Tech</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services Performed:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Servicing Company</th>
<th>Name &amp; Phone Number of Tech</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services Performed:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Servicing Company</th>
<th>Name &amp; Phone Number of Tech</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services Performed:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Servicing Company</th>
<th>Name &amp; Phone Number of Tech</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services Performed:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Site Service History

<table>
<thead>
<tr>
<th>Date:</th>
<th>Servicing Company:</th>
<th>Name &amp; Phone Number of Tech:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services Performed:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date:</th>
<th>Servicing Company:</th>
<th>Name &amp; Phone Number of Tech:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services Performed:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date:</th>
<th>Servicing Company:</th>
<th>Name &amp; Phone Number of Tech:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services Performed:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date:</th>
<th>Servicing Company:</th>
<th>Name &amp; Phone Number of Tech:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services Performed:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date:</th>
<th>Servicing Company:</th>
<th>Name &amp; Phone Number of Tech:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Services Performed:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td>Servicing Company:</td>
<td>Name &amp; Phone Number of Tech:</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Services Performed:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Servicing Company:</th>
<th>Name &amp; Phone Number of Tech:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Services Performed:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Servicing Company:</th>
<th>Name &amp; Phone Number of Tech:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Services Performed:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Servicing Company:</th>
<th>Name &amp; Phone Number of Tech:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Services Performed:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Servicing Company:</th>
<th>Name &amp; Phone Number of Tech:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Services Performed:
<table>
<thead>
<tr>
<th>Date:</th>
<th>Servicing Company:</th>
<th>Name &amp; Phone Number of Tech:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Services Performed:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Servicing Company:</th>
<th>Name &amp; Phone Number of Tech:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Services Performed:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Servicing Company:</th>
<th>Name &amp; Phone Number of Tech:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Services Performed:

<table>
<thead>
<tr>
<th>Date:</th>
<th>Servicing Company:</th>
<th>Name &amp; Phone Number of Tech:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Services Performed:
Dealer/Servicer Contact Information

Please complete the information below and keep this page in the manual so that the customer has this information for future sales, installation, and servicing needs.

<table>
<thead>
<tr>
<th>Dealer who sold the system:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Name:</td>
<td></td>
</tr>
<tr>
<td>Contact Person:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Phone Number:</td>
<td></td>
</tr>
<tr>
<td>Fax Number:</td>
<td></td>
</tr>
<tr>
<td>Email:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Installer who installed the system:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Name:</td>
<td></td>
</tr>
<tr>
<td>Contact Person:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Phone Number:</td>
<td></td>
</tr>
<tr>
<td>Fax Number:</td>
<td></td>
</tr>
<tr>
<td>Email:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contact for service:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Company Name:</td>
<td></td>
</tr>
<tr>
<td>Contact Person:</td>
<td></td>
</tr>
<tr>
<td>Address:</td>
<td></td>
</tr>
<tr>
<td>Phone Number:</td>
<td></td>
</tr>
<tr>
<td>Fax Number:</td>
<td></td>
</tr>
<tr>
<td>Email:</td>
<td></td>
</tr>
</tbody>
</table>
Glossary

A

Americans with Disabilities Act of 1990 (ADA): Act that requires businesses to make reasonable accommodations to people with disabilities. These requirements are especially important in new construction, but may be applied to existing facilities in some cases. More information can be found at www.ada.gov.

Access Interface (AI) Device: A device that connects to the Q2010 to perform a specific function within the system. Devices can include keypads, single door expansion modules, and relay expansion modules.

Alarm File: A computer file that associates the number painted on a door with an address and channel number that the door switch that monitors it is connected to.

Alarm Shunt: A temporary bypass of a switch, photobeam, or motion sensor so that an alarm can be set from inside the protected area while still allowing the person setting the alarm to leave the area without setting off the alarm.

American Wire Gauge (AWG): Standardized measurement of wire used in the United States.

B

BNC: A twist lock connector used with coaxial cable such as RG59U.

Bollard: 1. An architectural stand used to mount a keypad to allow users to more easily reach the keypad. It is typically filled with concrete. 2. A pipe mounted in the ground and filled with concrete placed beside and slightly in front of a gooseneck mounted keypad to prevent vehicles from striking the gooseneck as they pull up to use the keypad.

C

Cat 5 Network Cable: Twisted pair cable with four pairs of wire used in computer networks. Can be used to connect the Q2010 to the computer using an Ethernet connection. This cable should never be used for any other connections in the Q2010 system, especially AI devices.

Common: The bare data communications wire in the system that is used as an electrical reference and ground for RS485 data.

Compression Fitting: A conduit fitting used to connect the end of a conduit to a hole in the housing of an electrical device or junction box. Prevents moisture from getting through the connection.

Conduit: Metal or plastic pipe through which wire runs throughout a site.

Contactor Block: A relay capable of running at high voltages that is triggered by a low voltage relay in the system. Generally used for controlling lights.

Conventional Two-wire: Door switch installation method that uses two individual wires for each switch.

Cross-sectional Area (CSA): A standardized measurement of wire used in some countries.

D

Disability Discrimination Act (DDA): A law in both the UK and Australia pertaining to the rights of disabled persons. Similar to the Americans with Disabilities Act.

Direct 90: A conduit pipe connector that makes a sharp 90 degree bend at an exact 90 degree angle. Primarily used for plumbing conduit. Generally, wire should not be pulled through this conduit as the wire is easily damaged when pulled over the angle.

Direct Burial: A cable type commonly used in locations with a high water table where cable will be pulled through underground conduit. The insulation on this cable is thicker and stronger and there is a self-sealing gel inside that helps prevent damage to the cable. Generally, this cable is protected with a thick metal shield inside the insulation. Some municipalities require Direct burial cable in all low voltage installation.

Ditek: A surge protection device that protects RS232 or RS485 lines by interrupting a surge and directing it to ground. Extremely important in locations where lightning and electrical discharge is a problem.

Door Strike: An electronic lock for a door that can be connected to the Q2010 or to a keypad to control access to the door.

E

E9-Y Tool: A tool manufactured by 3M used to crimp 3M U-type connectors. (See also UG, UY2, and UR2).

Earth Ground: An electrical connection made to the earth via a wire to a copper rod buried in the ground or via a wire to a water pipe that goes underground.

Ethernet: A network type used to connect multiple computers together.
**Gate Operator:** A motorized electronic device used to open or close a gate in a fence line. May be a slide gate, swing gate, or vertical lift. (See also UL325.)

**Gooseneck:** A stand used to mount a keypad to allow users to more easily reach the keypad from a car or wheelchair. Available in wall mount and freestanding models.

**Graphics Serial Adapter:** RS232 to RS485 converter that connects the Q2010 to the graphics computer.

**Ground:** see Earth Ground.

**Ground Fault:** Any situation in which the potential of one end of a wire is lower than the other resulting in electrical flow through a wire. If the wire is not supposed to have electricity flowing through it or if the wire is connected to a device with specific current and voltage requirements (such as data), this can cause power or communication problems.

**Input:** A location in the system to connect exterior switch devices allowing the system to monitor these items. Such switch devices include door alarm switches, motion sensors, photobeams, and pressure pads.

**Junction Box:** A sealed electrical box used for conduit terminations to provide a protected location for wire to be pulled through conduit and service access to wire splices.

**Key Fob:** A small pendant device used for access by waving it near a proximity device or, on some models, by pushing a button on the fob while pointing it towards the proximity reader. Can be carried on a keychain.

**Knockout:** A pre-engineered, stamped circle of metal on the housing of the Q2010, power supply, or junction box that can be easily pushed out or removed to allow access into the housing for conduit and/or wires. In most cases the hole is presized for a specific size of electrical conduit.

**Local Area Network (LAN):** A network of two or more computers connected together to share information, generally in the same building or on the same site.

**Lighting Zones:** Lighting zones control lights in a building by automatically turning off the lights when no one is in that area or on that floor. The lights will turn on automatically when someone in that area logs onto the property and turn off again after they leave.

**LogixScript:** Program that allows custom script commands to occur based on If/Then situations. Refer to the QMS Help Files for more information.

**Motion Sensor:** A device that uses infrared sensors to track heat to monitor an area for motion to set off an alarm if someone moves through the protected area.

**Network:** Two or more computers connected together to share information.

**Normally Closed:** A relay-activated device in which the switch position is closed in normal circumstances and opens only when the relay is activated.

**Normally Open:** A relay-activated device in which the switch position is open in normal circumstances and closes only when the relay is activated.

**Opto-Isolator:** A surge protection device used to protect the RS232 or RS485 lines by converting the electrical signal to light, shooting it across a gap, and then converting it back to an electrical signal. This break in the data line helps protect devices against surge damage. Important in locations where lightning and electrical discharge is a problem.

**Output Relay:** A relay within the system that responds to programmed commands to close or open the switch, activating a device such as a gate, door strike, elevator button, lighting zone, or siren.

**Panduit Wire Raceway:** Used to run wire through drop ceilings and inside service rooms or network rooms. Keeps wire neatly organized and protected from damage. Some raceways hide wire that is run along walls and would otherwise be visible and vulnerable.

**Photo Beam:** A device that uses beams of light to protect a perimeter, setting off an alarm if the beam of light is broken.

**Plenum:** A cable insulation type commonly used in drop ceilings. Required by code in some areas.
**Proximity Reader:** A device used to read cards or key fobs that are presented in proximity to the device. Proximity readers can read cards or key fobs anywhere from an inch away up to several feet depending on the size and type purchased. These devices communicate to the system using Wiegand protocol language.

**Pull Box:** A junction box specifically designed for conduit terminations for wire pulling. Generally, multiple conduits going to different locations will all terminate in the same pull box at the main building. It is not unusual to have several pull boxes on a site.

**PVC:** 1. Plastic pipe used for plumbing or electrical. Generally, white PVC is used for plumbing and gray PVC is used for electrical. National Electrical Code requires that electrical rated conduit be used for pulling wire. 2. A cable insulation type for wire.

**Q2010:** The base unit/controller for the access control system.

**Q Relay Expansion Module:** Controls up to eight relay devices. Also has eight supplementary door alarm inputs on the board.

**Radio Frequency Interference (RFI):** Interference that can be caused in a system by strong radio signals from radio antennas, military bases, airports, radar, power plants, certain types of lighting, and communications equipment. Humidity, temperature, and cloud cover as well as broadcasting strength and proximity to the RF source can all make the problem worse.

**RB5 Relay:** A relay used when installing multiple power supplies on a system that allows all power supplies to be reset from the Q2010.

**Relay:** A switch located in electronics used to control another device.

**Remote Device:** Generic name used for keypads, single door expansion modules, and relay expansion modules. (See AI Device.)

**RF:** Radio Frequency.

**RG59U:** Type of wire used in video and surveillance to transmit a video signal from a camera to the video recorder.

**RS232:** A protocol used for transmitting data between the Q2010 and the QMS computer at distances up to 50 feet.

**RS485:** A protocol used for transmitting data between the Q2010 and AI devices.

**Running Common Ground:** Door switch installation method that uses one or two running common grounds for all doors in a line. Each ground leg of the switches is attached to the same ground using a 3M UG connector without cutting the ground.

**Script (Scripting):** Programmed commands in QMS that allow custom operations to occur based on If/Then situations.

**Secure Interior Relay:** In UL rated installations, any relay that controls a gate or door that must be located in a secure area (i.e., the relay located inside an entrance keypad is not used to open the gate).

**Service Loop:** Extra wire pulled into a junction box or AI device and looped to allow for future service or maintenance on a splice.

**Site Graphics:** Graphic display that shows the current status of security on the site and acts as a marketing tool and visual representation of the security for customers.

**Spade Connectors:** Devices used to connect wires to screw terminals. The wire is stripped back and the spade connector is crimped onto the bare wire. The forked connector is then slid onto the screw and the screw is tightened.

**Splice:** A connection of two or more wires where connections are made in an above-ground junction box with at least one foot of additional wire to act as a service loop.

**Strip:** Remove insulation from wire for splicing and connection purposes.

**Surveillance:** The use of cameras to monitor an area.

**Sweep 90:** A conduit pipe connector that makes a gentle 90 degree bend over a curve instead of a perfect 90 degree angle. This makes pulling wire much easier and less likely to damage the wires from the stress of pulling around the bend. Sweep 90 connectors are required for wire conduit.

**Standard Wire Gauge (SWG):** Also called Imperial Wire Gauge and British Standard Wire Gauge. A standardized measurement of wire used in the United Kingdom.
**T**

**Transformer:** A device used to convert high voltage to low voltage to power low voltage equipment.

**Trunk Line:** Telephone wire available in 50 or 24 conductor versions. Conductor wires are color coded, twisted pair, solid copper.

**UL**

**UG:** A wire splicing connector manufactured by 3M used to connect a terminated wire to a non-terminating running common ground. The device has a silicone gel that protects the splice.

**UL:** Underwriters Laboratories. An independent, nonprofit, private research firm that determines safety standards and certification for insurance industry underwriting of electrical, electronic, and motorized devices. These standards are often adopted in laws, municipal codes, and installation guidelines. (See also UL325)

**UL325:** A safety standard for gate operators, automatic doors, and similar devices. Under Federal Law 29 CFR 1910.399, the Occupational Safety and Health Administration (OSHA) requires all employee workplaces with gate operators or automatic doors to comply with the safety requirements of this standard.

**Uninterruptible Power Supply (UPS):** A device that performs three functions: (a) power surge protection, (b) power conditioning, and (c) battery backup.

**UR2:** A wire splicing connector manufactured by 3M used to connect three terminated wires together. The device has a silicone gel that protects the splice.

**USB:** A protocol used for transmitting data between the Q2010 and the QMS computer at distances up to 16 feet.

**UY2:** A wire splicing connector manufactured by 3M used to connect two terminated wires together. The device has a silicone gel that protects the splice.

**Virtual Relay:** An on/off command that can be programmed into QMS to perform a function. (See LogixScript and Script.)

**Voltage Drop:** Loss of voltage that comes from resistance in wire due to distance. Also affected by humidity, temperature, splices, and the current draw of devices located on a line. Must be taken into consideration when planning equipment location and power supply needs for a site.

**W**

**Wide Area Network (WAN):** A network of two or more computers connected together to share information over large distances.

**Wiegand Expansion Module:** 1) A protocol language used for many access control devices such as proximity readers, key fobs, and fingerprint readers. 2) The name of an AI device that communicates with access control devices.