Access Control Systems

Network-Based Access Control Systems

Hardware Installation Manual

Part 62-15370001 Version 1.02, August 2006

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NOTE: Please read this manual in its entirety before attempting installation

PREAMBLES

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Technical Prerequisites

This installation guide for the Ringdale Access Control System assumes that the installer is familiar with the basic operation of the following:

- Microsoft Windows operating systems
- Microsoft Windows Servers
- Ethernet topology, TCP/IP protocols
- Ethernet routers, switches and hubs
- Basic principles of wiring and cabling

Technical Support

Ringdale Technical Support services help to ensure that Ringdale products and pertinent networks operate efficiently and benefit from the most up-to-date system and application software. Ringdale offers a flexible suite of support services designed to meet individual business needs and assists in effectively installing and maintaining products and networks to maintain high-quality network performance.

Telephone Technical Support for Ringdale Access Control Systems is available for the Ringdale subject matter items covered in this installation guide and is provided free-of-charge for the duration of the original warranty period.

Technical Support from Ringdale is also available for all of the above listed prerequisites. The current terms, conditions and rates for Technical Support are available on request, minimum two hours.

Components Used

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration.

IMPORTANT INSTALLATION INFORMATION

Please read this information before starting the installation process.

Recommendation for First Time Installers

If you are installing a Ringdale Access Control system for the very first time and prior to starting the installation process, we strongly recommend that you implement an installation "dry run" to acquaint yourself with each of the components and the overall operation of the system. Using a suitable table as a test-bed, simply wire each item of the proposed system together as per the appropriate schematic described in the next few pages of this document. From this test-bed you will then get a better understanding of how and where each item is connected / wired together to make a complete system and you will be able to verify that the power supply is working and that each ID Reader, Relay and Door Lock is functioning correctly. Once you have verified the system in this manner, it is then just a matter of extending the cable lengths to meet the actual installation criteria. And if for whatever reason you are experiencing problems with the system on the test-bed, it makes problem determination and resolution via the Ringdale Technical Support group so much easier at this stage than if the system has been fully installed.

List of Do's and Don'ts

1. To prevent damage to components and circuitry, it is imperative that the power connections from the battery and power supply be attached to the user-installed wiring harness AFTER all other connections are made. Put another way; complete the wiring connection to all of the various components (ID Readers, Keypads, Locks, Relays, etc.) BEFORE connecting the battery and power supply into the circuit.

2. Do not connect an ID Reader and a Relay in series. Each ID Reader, Keypad, Relay and Lock must have its own dedicated +12 Volt cabling run from the Battery/Power Supply. Due to the current spike that occurs when a relay and door strike are activated, serious system errors will occur if this instruction is not heeded.

3. When planning the cabling schematic for an installation, use the appropriate gauge wire for supplying power to the various door locks available from different vendors. For example, please note the following:

Lock Manufacturer	Required Voltage	Current Draw (Milliamps)	Comments
Hess	12 Volts DC	400	Various models, varying current draw
RCI	12 Volts DC	225	Various models, varying current draw

   If the total power consumption of the door locks for any one Access Control system exceeds 500 mA, then one power supply must be used for the ID Readers and Access Controller, while a separate power supply must be used to power the Relays and Locks.

4. The green earth connection from the mains power supply MUST NOT be removed from the terminal on the side of the Access Control box, it must remain connected at all times.

IMPORTANT INSTALLATION INFORMATION, continued

5. The Power Supply for the Access Control system should only be powered-on with a battery in the circuit. If for any reason there is a need to test or use the Power Supply without a battery fitted, please ensure that the connectors at the end of the battery leads are insulated and cannot cause a short.

6. If it becomes necessary to upgrade the firmware on the Access Control system, or reset the controller to its factory default settings, please contact Ringdale technical support to be guided through the procedure (contact details at the back of this manual).

7. When installing the Access Control system, please take into account the length of cable required to connect the controller to the various ID devices, card readers, network and mains power supply.
   The maximum wire length (+12 Volt and Return Ground wires) between the Battery/Power Supply and any device should be 300 feet maximum. This is due to the electrical characteristics and current drop associated with carrying 12 Volt DC over 20 SWG wire.

8. For security and safety considerations, all wiring connections to the Power Supply should be housed inside the UPS box. In all possible hardware configurations, an appropriate sized wire nut should be used to connect all of the +12 Volt wires together. In all possible hardware configurations, an appropriate sized wire nut should be used to connect all of the Return Ground wires together. These wire connections must be housed inside the power supply box.

9. All wiring must follow local wiring codes. Failure to follow local wiring codes may result in serious damage to components or become a fire hazard. Ringdale Inc. cannot be held responsible for any damage caused by faulty or sub-standard wiring practices performed during the installation process.

10. In any of the Access Controller configurations (one or two ID Reader configurations, etc), all Return Ground wires will need to be gathered together within the Power Supply box and tied together via a wiring nut. Similarly, all +12 Volt wires will need to be gathered together within the Power Supply box and tied together via a wiring nut.

Wiring Priorities

1) For ease of installation and integrity of connections, it is recommended that stranded copper wire be used for all wiring runs from the Power Supply to the various ancillaries.

2) Build the +12-volt and Return Ground wiring harness and connect all the system components (ID Readers, Relays, Door Strikes, etc) to it, but do not connect the battery or power supply to the wiring harness.

3) After stage (2) above is completed, connect the +12-volt wiring harness to the power supply PCBA.

4) After stages (2) and (3) above are completed, connect the battery to the power supply.

5) When all other wiring stages and connections are completed, then is the time to plug the 110-volt power cable into the receptacle at the top left-hand side of the power supply.

IMPORTANT INSTALLATION INFORMATION, continued

Warning – Safety Isolation

When connecting the Power Supply of an Access Control system to the mains electricity supply, first ensure that the Power Supply is safely isolated.

Safety Regulations and Fuses

Depending on the local safety regulations, it is recommended that the Access Control power supply be connected to a switchable and/or fused distribution point with a higher rating than the internal mains fuse.

- Fuse rating for fuse F1 (Mains Fuse) is T1.0 A/250V SloBlo
- Fuse rating for fuse F2 (Battery Fuse) is T3.15 A/125V

Always replace a fuse with one of the same rating.

For safety reasons the mains electricity transformers are in the protective casing at the top of the Access Control Box.

Connecting the Power Supply of an Access Controller to the Mains Supply

Do not connect the power supply of an Access Controller to the 110 Volt mains supply until after the +12 Volt and Return Ground wiring harness has been completed and all other components of the system (ID Readers, Keypads, Relays, Locks, etc) have been connected to the Power Supply. Failure to do so may cause damage to components and circuitry and void the factory warranty.

When all of the aforementioned wiring has been completed, use the supplied power cable to connect the system to a standard 110 Volt wall outlet. The mains connector is located on the top left-hand side of the box.

Battery Details

Ringdale can supply a suitable 18 Ah battery for the Access Control system. If the customer wants to supply the battery separately, then any sealed lead-acid type rechargeable battery of **12V DC** with **1.2Ah** up to **18Ah** should be suitable, up to a maximum physical size of:

    Width: 180 mm
    Depth: 75 mm
    Height: 167 mm

The storage capacity of the battery to be used will depend on your particular requirements. An example of a suitable 1.2 Ah battery is the YUASA NP1 2-12. An example of a suitable 18 Ah battery is the Universal Battery UB12180.

The + (positive) and - (negative) battery leads fit to the respective connectors on the battery (Note: two sets of leads with different connectors are supplied with all Access Control Systems, use the type that is suitable for the battery that you are fitting).

INTRODUCTION AND OVERVIEW, ACCESS CONTROL SYSTEMS

This guide is designed to provide hardware installation instructions for the Ringdale Network-Based Access Control Systems.

The Ringdale Access Control System is a modular design that allows the end-user or installer to configure a complete Access Control system by selecting the required security devices from a catalogue of supplementary items. A typical configuration would consist of the Access Controller (UPS Power Supply complete with battery), one or two ID readers or keypads and up to two relay-activated Door Strikes or Magnetic Locks. In normal operation the battery is trickle charged via a mains transformer and during a power failure the battery continues supplying power (UPS) to the system.

Each Network-Based Access Control system is connected to the Sentinel centralized management and configuration software from Ringdale via any Ethernet network, providing comprehensive management and monitoring capabilities. The Sentinel management software delivers superior functionality and a high standard of supervision (see the separate "Sentinel Software Installation and Configuration Guide" that accompanies the product).

When designing an Access Control system, the starting point is to select the Identification (ID) Readers and Door Locks that best suit the needs of the end-user and their building. Ringdale provides a wide selection of Readers for just about every need, including Fingerprint, Proximity Card, Magnetic Swipe, Keypads, Combination Readers (Combis) and Time and Attendance terminals. When you have selected the applicable reader(s), you will then need to select the appropriate Ringdale UPS Power Supply / Access Controller, of which at present there are three.

1. Part number 00-16-0444-000 is a UPS Power Supply that is capable of providing +12 Volt and Common Ground for up to two Combi Readers and up to two Door Locks. In this configuration, the Access Control capabilities are built into the Combi Readers, but you will need this power supply to complete the system. The Combi Readers and associated relays interconnect via standard USB cables and an encrypted communications protocol.

2. Part number 00-16-0537-1100 is a UPS Power Supply that includes one Access Controller. It is used to control one door using one Reader (non-Combi) and one Door Lock. The ID Reader and associated relay interconnect via standard USB cables and an encrypted communications protocol.

3. Part number 00-16-0537-1101 is a UPS Power Supply that includes two Access Controllers. It is used to control up to two doors using up to two Readers (non-Combi) and up to two Door Locks. The ID Readers and associated relays interconnect via standard USB cables and an encrypted communications protocol.

Additional details and specifications on all of the Ringdale Access Control systems and ancillaries are available on the Ringdale web site (www.ringdale.com).

A list of the most common ancillaries is included on the next page.

ACCESS CONTROL SYSTEM HARDWARE CONFIGURATOR

Some of the more common configuration options for the Ringdale Access Control systems are listed below. Starting from the left-hand column, select the accessories that best suit the access requirements for the customer's building. This selection will then determine which of the three Power Supplies / Access Controllers as described earlier will be required to support the accessories.

Accessory	Accessory Description	System I/F	Access Control 00	Access Control 01	Access Control 02	Relay: Note (a)
00-16-0537-0100	Combi-Reader, Keypad & Fingerprint ID	USB	No	No	2	
00-16-0537-0300	Combi-Reader, Proximity & Fingerprint ID	USB	No	No	1	
00-16-0537-0500	Combi-Reader, HID Proximity & Fingerprint ID	USB	No	No	1	
00-16-0482-0000	Optical Fingerprint Reader, Angled Wall-Mount	USB	1	2	No	
00-16-0541-0100	Proximity Reader, HiTag, Wall-Mount	USB	1	2	No	
00-16-4065-0000	HID Proximity Readers, Stand-alone, see note (d)	12 Volt	1	2	No	
00-16-0451-0055	Access Keypad, Black / White (NAT)		1	2	No	
00-16-4000-0051	Rugged Magnetic Swipe Card Reader		1	2	No	
00-16-0533-0100	Time And Attendance Terminal	RJ45	1	2	No	
88-00000156	Battery, Leadacid, 12 Volt, 18 Ah, Universal	12 Volt	1	1	1	
Door Strike	Door Strikes, extensive selection, see Note (c)	12 Volt	1	2	2	1 Per
Magnetic Lock	Door Locks, extensive selection, see Note (c)	12 Volt	1	2	2	1 Per
Push Button	Push Button (various models)	12 Volt	1	2	2	
00-16-0482-0024	Optical Fingerprint Reader, Enrollment	USB	Note (b)	Note (b)	Note (b)	

NOTES

Note (a) USB Relay, part number 00-19-0532-0008, 1 required per Door Strike / Lock.
Note (b) For User Enrollment, actual quantity required may depend upon system configuration.
Note (c) A comprehensive selection of doorstrikes is available to meet the multitude of door and doorframe configurations, please contact Ringdale Sales for more information.
Note (d) Each HID Proximity Reader will require one HID-to-USB Converter, part 00-19-0529-0000.
AC 00 Part number 00-16-0537-1100 supports one ID Reader (non-Combi) and one Door Lock.
AC 01 Part 00-16-0537-1101 supports up to 2 ID Readers (non-Combi) and up to 2 Door Locks.
AC 02 Part 00-16-0444-1100 supports up to two Combi Readers and up to two Door Locks.

The above Configurator highlights the importance of selecting the correct ID readers and door locks because this selection will determine which one of the three Access Control systems is required. For example, if you are deploying Combi Readers, then the required power supply system is 00-16-0444-1100. Conversely, if non-Combi Readers are to be deployed, then it is a matter of choosing between 00-16-0537-1100 (controls one door) and 00-16-0537-1101 (to control up to two doors).

UPS POWERSUPPLY 00-16-0444-1100 OVERVIEW

Included with the UPS power supply (110-240 Volt in, 12 Volt DC, 800 MA out) are the following user-installable items:

- Battery cables, 1 pair, 15" long.
- +12 Volt Cable, qty 1, 15" long.
- Gland Nut, qty 2.
- Wire nuts, assorted
- Spare fuses (two sets)
- Screws and Rawlplugs for mounting Box to wall.
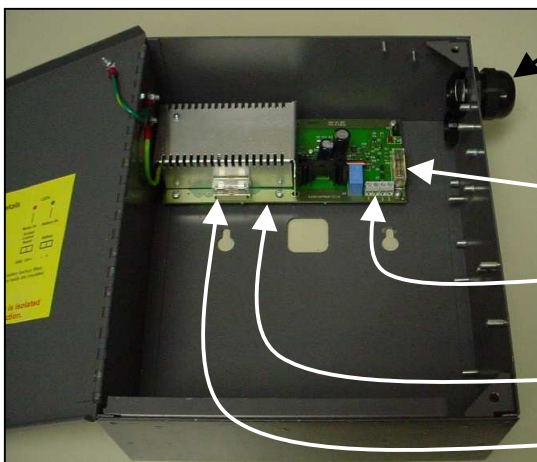
Gland Nut for cables to pass through box. (NOTE: Position of holes for gland nuts may vary based on version of box being supplied)

Fuse, 3.15 Amp, 250 VAC.

Screw Terminal connectors for battery and external wiring harness.

Power Supply Assembly.

Fuse, 1.0 Amp, 250 VAC SloBlo
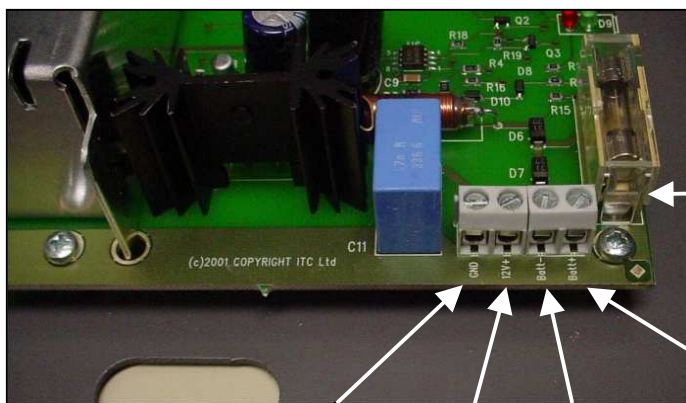
Fuse, 3.15 Amp, 250 VAC.

Connection point for Return Ground wiring harness.	**Connection point for +12 Volt wiring harness.**	**Connection point for wire from Battery, Negative (-) terminal.**	**Connection point for wire from Battery, Positive (+) terminal.**

IMPORTANT NOTE: To prevent damaged components and the risk of fire from the +12 volt power supply, it is imperative that all other wiring is connected first, before connecting the Battery/Power Supply to the wiring harness and into the circuitry. If this warning is not heeded, then the warranty is voided because components and circuitry can be damaged and will not be repaired or replaced under warranty.

DESIGNING A WIRING HARNESS

For the Network-Based Access Control system to perform reliably and consistently, careful attention needs to be paid to the design, construction and layout of the wiring harness.

A dedicated wiring run needs to be made from the Access Control power supply to each and every ID Reader, Keypad, Relay and Door Lock. System failures will occur if there is any deviation from the design of the wiring harness and the factory warranty will be voided.

Return Ground Wires

A separate return ground wire will need to be run from the Power Supply to each Identification Reader and each Door Lock. For safety and security considerations, these return ground wires will need to be terminated inside the power supply box and then connected to the supplied Return Ground (Black) wire from the power supply with a wire nut.
We strongly recommend using 20 SWG cable, certainly no smaller than 24 SWG.
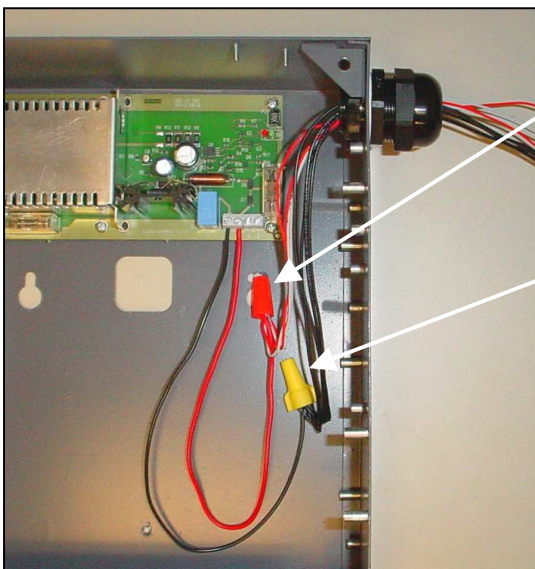
+12 Volt Supply Wires

A separate +12 Volt wire will need to be run from the Access Control power supply to each Identification Reader and each Relay. For safety and security considerations, these +12 Volt wires will need to be terminated inside the power supply box and then connected to the supplied +12 Volt (Red) wire from the power supply with a wire nut.
We strongly recommend using 20 SWG cable, certainly no smaller than 24 SWG
We strongly recommend the following wiring colors for the +12 Volt supply:

- **RED** for the +12 Volt supply from the Access Control power supply to the ID Readers
- **WHITE** for the +12 Volt supply from the Access Control power supply to the Relays (connects to the White wire at the relay).

Example of Connections Within the Power Supply Box

As can be seen from this example of an Access Control power supply with a wiring harness for 2 Combi Readers, 2 Relays and 2 Door Strikes; the required +12 Volt cables (four total; two Red and two White) are attached by a red wire nut to the red +12 volt cable from the power supply.

Also, the required Return Ground cables (four, black) are attached by a yellow wire nut to the black Ground cable from the power supply.

IMPORTANT NOTE: You must connect all other wiring first before connecting the Battery and Power Supply to the wiring harness. Failure to heed this warning may void the warranty because components and circuitry can be damaged and will not be repaired or replaced under warranty.

WIRING SCHEMATIC, SINGLE COMBI READER SYSTEM

Return Ground Wires

Power Supply / Battery Charger

Battery

White Wire (12V Supply)

Red Wire (not used)

Green Wire

12V

GND

Door Strike or Lock

Red Wire (12V Supply)

Return Ground Wire

Relay

12V   GND

Combi Reader

USB Cable

Ethernet Cable

LINE DRAWING	WIRE DESCRIPTION
———————	Black, Ground
▬▬▬▬▬▬▬	USB Cable
▨▨▨▨▨▨▨	+12 Volt supply, Red to Combi Readers, White to Relays
- - - - - - - - -	Green Wire, interconnects a Relay and a Door Lock
• • • • • • • • •	Red Wire, only used with Magnetic Locks

Please note that the included green/yellow earthing wire that exits the back of the Combi Reader case will need to be securely attached to an earth grounding point for the building or premises.

WIRING SCHEMATIC, TWO COMBI READERS SYSTEM

Power Supply / Battery Charger

Battery

Return Ground Wires

Red Wire (not used)

White Wires (12V Supply)

Green Wire

12V

GND

Red Wires (12V Supply)

White Wire (12V Supply)

Door Strike or Lock

Relay

Red Wire (12V Supply)

Return Ground Wire

12V

GND

Combi Reader

USB Cable

Red Wire (not used)

Green Wire

12V

GND

Ethernet

Door Strike or Lock

Relay

Red Wire (12V Supply)

GND

12V

Combi Reader

USB Cable

Ethernet Cable

Wiring Schematic, Combi Readers, continued

REMINDER: Key to the two wiring schematics on the previous pages

LINE DRAWING	WIRE DESCRIPTION
▬▬▬▬▬▬	Black, Ground
▬▬▬▬▬▬	USB Cable
▬▬▬▬▬▬	+12 Volt supply, Red to Combi Readers, White to Relays
▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪	Green Wire, interconnects a Relay and a Door Lock
● ● ● ● ● ● ● ● ● ● ● ● ●	Red Wire, only used with Magnetic Locks

Please note that the included green/yellow earthing wire that exits the back of the Combi Reader case will need to be securely attached to an earth grounding point for the building or premises.

WIRING A COMBI READER (KEYPAD OR PROXIMITY VERSION)

All wiring connections need to be made to the reverse side of any Combi Reader before it is attached to a backplate on the wall. Below is an overview of the various connection points on the Combi Reader, including:

- Ethernet LAN connection (RJ45 CAT5 UTP cable), qty 1.
- Screw Terminals for +12 volt power and return ground.
- Internal Connector for the keypad & fingerprint reader (up to 2, factory installed).
- USB Cable Connectors, qty 2.
- Premises ground wire (the included green/yellow earthing wire exits at the back of the case and will need to be securely attached to an earth grounding point for the building or premises).

Ethernet LAN RJ45 Connector

Screw Terminals for Power & Ground

LED's for monitoring the Ethernet connection

Internal Connectors for ID Readers (factory installed).

USB Cable connectors (2)
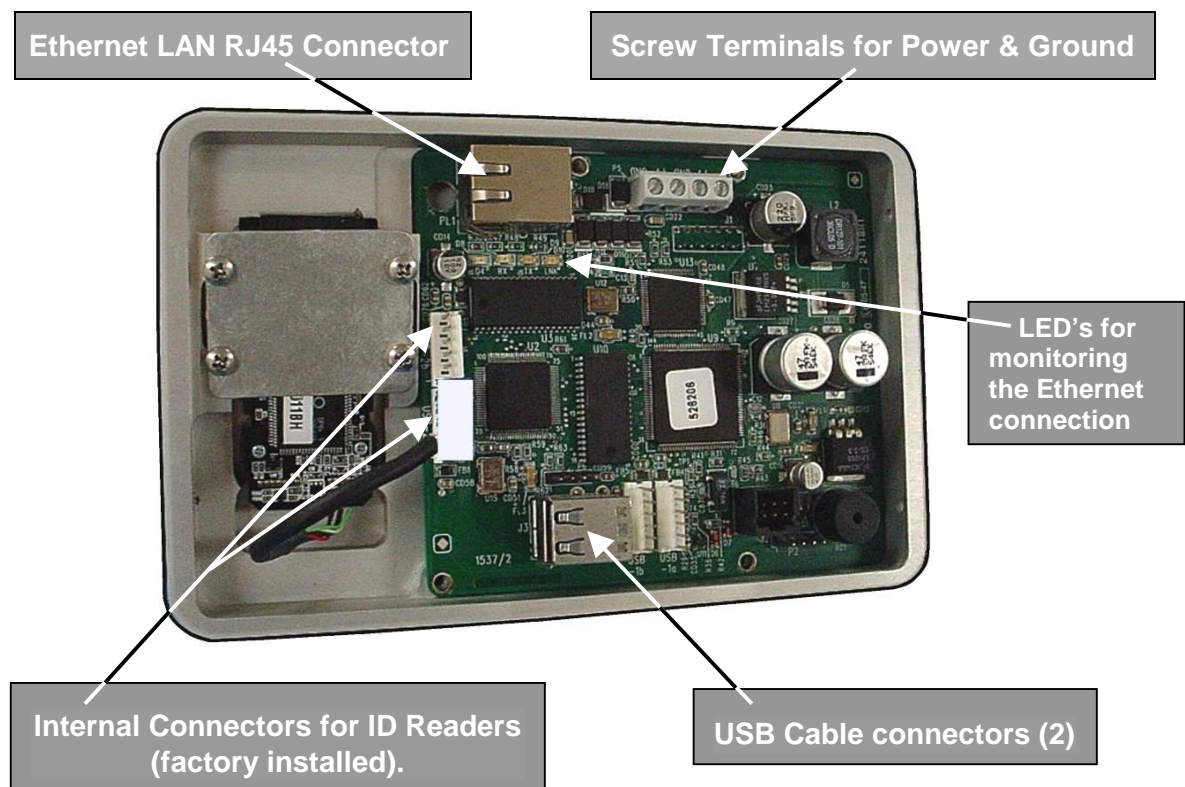
Connecting a Combi Reader to the Network

The Combi Reader is connected to your LAN via standard 10base-T CAT5/6 UTP Ethernet cable and an RJ45 connector. The Combi Reader and the Sentinel server communicate to each other via this LAN connection. You will need to connect the Combi Reader to the nearest LAN outlet via a suitable length of Ethernet cable. LEDs are provided on the PCBA to allow initial monitoring of the network connection (see above). The configuration of the LEDs is as follows:

- **Yellow**   **- Link** LED: indicates that the connection is functioning.
- **Red**   **- TX** LED: blinks on **Transmission** of a data packet.
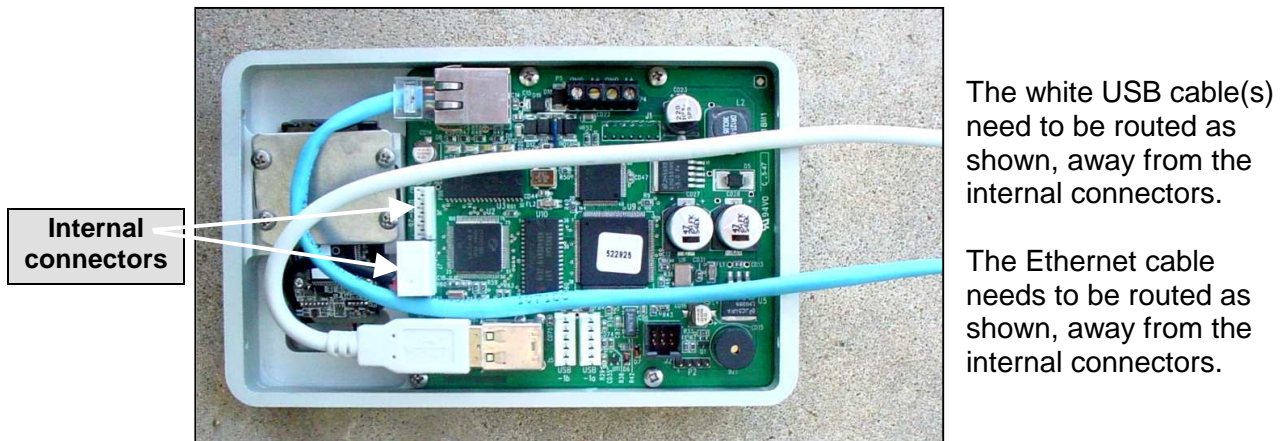- **Green**   **- RX** LED: Blinks on **Receipt** of a data packet.

Once the Access Control system is connected to the network, the Combi Readers can be configured using the Sentinel network card reader software that accompanies the product. Please consult the Sentinel software manual for details on how to install and configure Sentinel.

WIRING A COMBI READER (KEYPAD OR PROXIMITY VERSION), continued

Connecting a Combi Reader to USB & Ethernet Cables

Care must be taken when routing the USB and Ethernet cables within the Combi Reader. Each cable needs to be routed such that it does not rest on top of the internal connectors. Damage to the PCBA and/or internal cabling may occur when the Combi Reader is attached to its backplate if any of these cables are incorrectly routed over the internal connectors, see diagram below.

Special attention needs to be paid to the routing of cables inside the Combi Reader.

The white USB cable(s) need to be routed as shown, away from the internal connectors.

The Ethernet cable needs to be routed as shown, away from the internal connectors.

Connecting a Combi Reader to a Relay

The method of connecting a Combi Reader to a relay is via the supplied USB cable. It conforms to the USB cabling specification 2.0 and as such, the USB cable can be no more than 5 meters (16.25 feet) long in total.

A simplified example of the operation of the system is as follows: When a valid Fingerprint ID has been successfully read, or when a valid PIN number is entered via the 12-key pad, the Combi Reader communicates this successful read to the Relay via the USB cable using an encrypted data-stream.

The Type "A" end of the USB cable plugs into the USB connector in the Combi Reader and the Type "B" end of the USB cable plugs into the USB connector in the Relay. A 10-foot USB cable is included with each USB Relay.

The type "B" end of the USB cable plugs into the USB connector in the Relay


Connecting a Combi Reader to the Access Controller Power Supply

It is critical to get the correct polarity for this connection. If you orientate a Combi Reader as per the picture below, you will notice that alongside the screw terminal connector on the PCBA there is etched the appropriate connection information: "+V" is for +12 Volt and "GND" is for the return ground, see below.
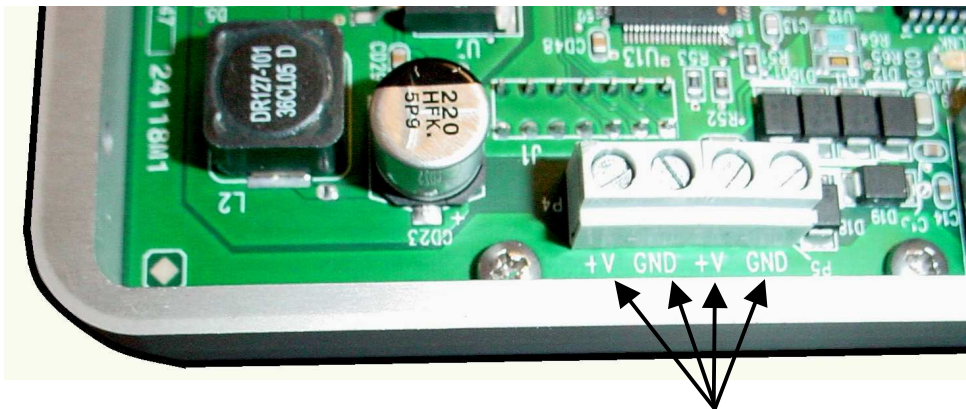
The connection points for both the +12 Volt and Return Ground cables from the Access Control power supply to a Combi Reader. Note the markings on the PCBA to assist in identifying the correct connection points for the wiring. The "+V" signifies a connection point for the +12 Volt (red) wire and "GND" signifies the connection point for the Return Ground (Black) wire. Correct polarity must be maintained, but you can connect the +12 Volt supply to either of the terminals marked "+V". Similarly, the ground wire can be connected to either of the screw terminals marked "GND".

When attaching the +12 Volt and the Return Ground cables to a Combi Reader, it is important that the wires are inserted into the connector in an orientation from the "inside – out" and then secured with a flat-bladed screwdriver. This is to ensure that the bare wires do not short-out against the outside case of the Combi Reader, see below.
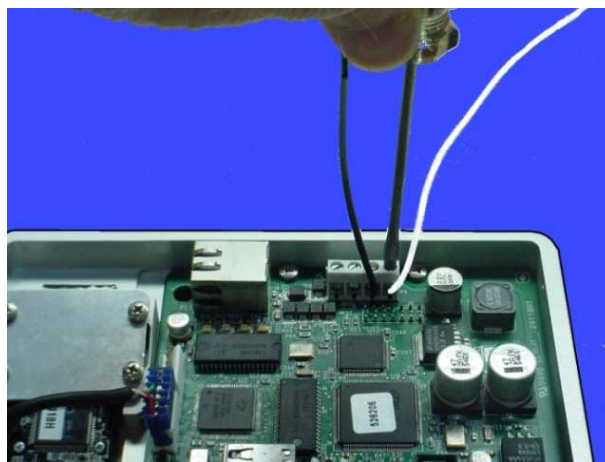
Again, correct polarity must be maintained, but you can connect the +12 Volt supply to either of the terminals marked "+V". Similarly, the return ground wire can be connected to either of the screw terminals marked "GND".

ONE COMBI PROXIMITY & FINGERPRINT ID READER PER ACCESS CONTROLLER

The installation and wiring of a "Combi Proximity Card Reader and Fingerprint ID Reader" into the Access Control system is identical to the "Combi Keypad Reader". The one exception is that each Access Control Power Supply will support only one Combi Proximity Reader, due to power consumption considerations.

Therefore, in an installation with a Combi Proximity Reader, only one Relay and one Door Strike is required.

Refer to the previous pages for instructions and guidelines on how to connect a Combi Reader to an Access Control Power Supply. Please note that the included green Earthing wire that exits the rear cover will need to be securely attached to an earth grounding point for the building or premises.

CONNECTING A TIME AND ATTENDANCE TERMINAL

The Ethernet-connected Time and Attendance Terminal includes a built-in Graphics Display, an Optical Fingerprint Reader and a Keypad to provide user interaction to and from the Sentinel Time and Attendance database.

The Time and Attendance Terminal signals the Sentinel Server Software with the ID details of the user. Sentinel authenticates this ID and then sends the details of the user and identifies the authenticated user's name on the display. The user now touches the IN or OUT button to indicate to the Server the transaction that the user has requested.

The installation and wiring of a Time and Attendance Terminal is very similar to the Combi Reader, except that just one Time and Attendance Terminal is supported by the Access Control power supply, due to power consumption considerations. And since there is no doorstrike in this configuration, a relay is not required.

The Time and Attendance Terminal will require a dedicated +12 Volt cable and a dedicated Return Ground cable from the Power Supply. A standard Ethernet cable (CAT-5/6 UTP) connects it to the network to enable communication to the Sentinel server. Please note that the included green Earthing wire that exits the rear cover will need to be securely attached to an earth grounding point for the building or premises. The Time and Attendance Terminal can be irreparably damaged if this earth grounding wire is not correctly installed.

Refer to the previous pages for instructions and guidelines (+12 Volt, return ground) on how to connect a Time and Attendance Terminal to a Power Supply and an Ethernet Network.

CONNECTING A DOOR STRIKE LOCK TO THE ACCESS CONTROL SYSTEM

Connecting a door strike to the Access Control system requires two dedicated wire runs. First, a ground (black) wire needs to be connected from the Return Ground wiring point at the UPS Power Supply (see previous section) to either of the two screw terminals on the Door Strike. Secondly, the other screw terminal of the Door Strike needs to be wired to the Green wire from the appropriate USB Relay from Ringdale. Below is a view of the terminals for a Door Strike (RCI version in this example):

Door Strike: Latch side.   Door Strike: Relay side.
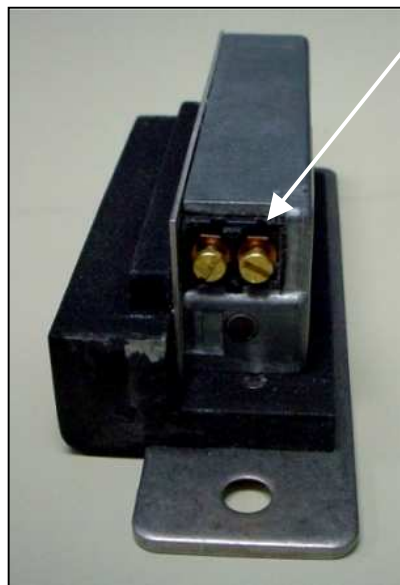
Note the two screw terminals on the Door Strike.

A dedicated Black (return ground) wire from the Access Control Power Supply connects to one of the screw terminals.

A Green wire from the in-circuit Ringdale USB Relay (part 00-19-0532-0008) connects to the other screw terminal. For the Door Strike in this example, it does not matter which wire goes to which screw terminal, as polarity is not important.

If you are using Door Strikes from elsewhere other than Ringdale, please note that they must be to the following specification. Failure to meet this specification may well cause a serious system malfunction:

- Voltage: +12 Volt DC, Non-Pulsed.
- Operation: Power To Open (PTO).
- Input Polarity: Protected by rectifier.
- Inrush Current: Less than 400 mA.
- Continuous operation: Less than 10mA.

CONNECTING A MAGNETIC DOOR LOCK TO THE ACCESS CONTROL SYSTEM

Connecting a magnetic door lock to the Access Control system requires two dedicated wire runs. First, a ground (black) wire needs to be connected from the Return Ground wiring point at the UPS Power Supply (see previous section) to either of the two screw terminals on the Magnetic Door Lock. Secondly, the other screw terminal of the Magnetic Door Lock needs to be wired to the Red (+12 Volt) wire from the appropriate USB Relay from Ringdale. In this configuration, the Access Control system provides constant power to the magnetic door lock. When a valid ID or PIN number has been successfully read, the relay will momentarily disrupt this +12 volt connection to deactivate the magnetic lock and open the door.

CONNECTING A USB RELAY TO THE ACCESS CONTROL SYSTEM

The function of the Relay is to control the opening and closing of the Door Lock (Door Strike or Magnetic Lock) by providing or removing +12 Volts DC. The length of "dwell" or opening / closing of the Door Lock is configured in the Sentinel software. When a valid ID has been received at the ID Reader and verified by Sentinel, the Relay is then instructed via the USB connection to cycle the Door Strike as per the Sentinel configuration parameters.

When it ships from Ringdale, the USB Relay Assembly (part number 00-19-0532-0008) consists of the following three items:

- Sentinel USB SPS (Single Pole Switchover) Relay (qty 1).
- USB Cable Assembly, type B USB socket, 10 feet long, qty 1.
- Cable Assembly, 3-conductor plus connector, 2 feet long, qty 1.

The wiring scheme for this Relay cable is as follows:

- The White wire is for a dedicated +12 Volt supply from the Power Supply.
- The Green wire is for connecting to either one of the screw terminals on the Door Strike.
- The Red wire is for use only with Magnetic Locks.

USB Relay Wiring Scheme

1) Door Locks:
   a) If a Door Strike is used, connect the Green wire from the Relay to either one of the screw terminals on the Door Strike.
   b) If a Magnetic Lock is used, connect the Red wire to the Magnetic Lock.
2) Run a dedicated White +12 volt cable from the +12 Volt side of the Access Control Power Supply to the White cable of the Relay.
3) Next run a dedicated Black return ground cable from the "Ground" side of the Access Control Power Supply to either one of the screw terminals on the Door Lock.
4) Finally, run a dedicated USB cable from the Combi Reader to the USB connector on the Relay.

USB Relay Wiring Scheme, Color Coding

- Connect the White wire to a dedicated +12 Volt wire run from the Power Supply.

- Connect the Green wire to either one of the two screw terminals on the Door Strike.

- The Red wire is used to connect the Relay to a Magnetic Lock.

ACCESS CONTROL SYSTEMS FOR NON-COMBI READERS

- Part number 00-16-0537-1100 is suitable to control a single door

- Part number 00-16-0537-1101 is suitable to control up to two doors

The above two Network-Based Access Control Systems are configured specifically for applications where various ID readers and accessories *other than the Combi-Reader versions* are to be used. Unlike the Combi-Reader based solutions, all connections, cabling and wiring (Ethernet, USB, +12V and Return Ground) terminate within the wall-mount power supply box.

Wiring Schematic, Single Reader (Non-Combi) Configuration
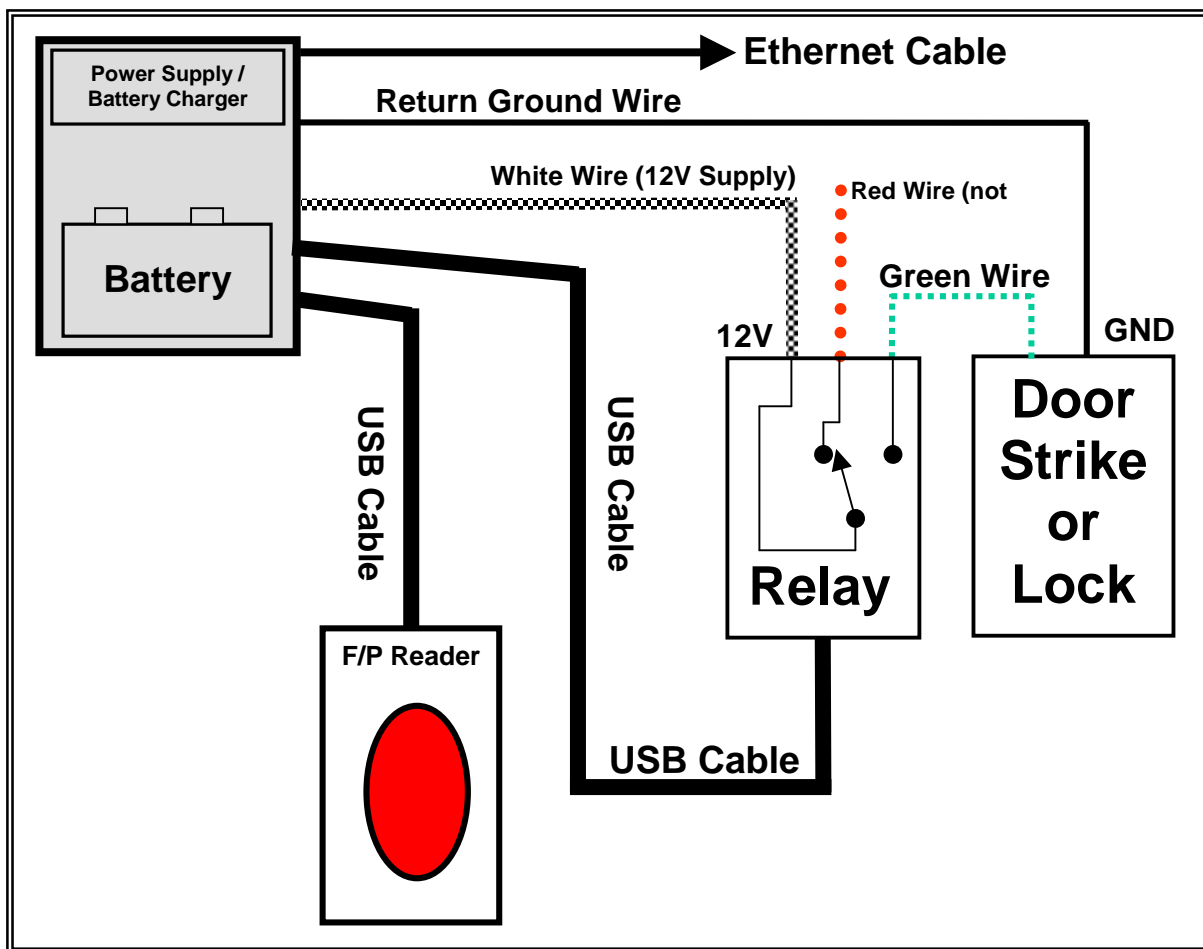
As outlined in the above schematic, all wiring for the **non-Combi variant** of the Access Control system terminates within the Power Supply box. The wiring and cabling in the above schematic would be doubled for a configuration with two ID readers (Fingerprint, Keypad, Proxi, etc) and two Door Locks. All of the various cables and wires are routed into the box either through the round holes in the side of the box or through the lager square hole in the back of the box.

Overview of an Access Control System for Non Combi-Readers

As described earlier in this document, for ID Readers and door locks that are not Combi-Readers, the UPS Power Supply includes one or two Access Control Assemblies (#1537), as detailed below:

UPS Power Supply assembly (battery not included).

Part of the factory-installed +12 Volt and Return Ground wiring from the power supply to the Access Control Assemblies.

Hole for optional routing of a wiring harness through the back of the box.

Space for a battery (18 Ah recommended).

Access Control Assemblies (PCBA 1537) - one is installed in a model 00-16-0534-1100 and two are installed in a model 00-16-0537-1101

Two holes (with blanking plugs) for optional routing of a wiring harness through the side of the box.

Part of the factory-installed +12 Volt and Return Ground wiring from the power supply to the Access Control Assemblies.

## Connecting an Access Control System to a Non-Combi Wiring Harness

In this picture, the top Access Control Assembly has been wired for one ID Reader and one Relay and has been attached to an Ethernet network. The USB cables from the Fingerprint Reader and the Relay are plugged into the two USB connectors and the Ethernet cable has been plugged into the RJ45 connector of this same Access Controller. All cables and wires are exiting to the right through one of the installed cable glands.

The black and red wires that were attached to the power supply have been removed and reattached via wire nuts to two short lengths of wire. A White wire from the Relay has been attached via the appropriate wire nut to the +12 Volt screw connector. A Black ground return wire from the Door Lock has been attached via the other appropriate wire nut to the GND.
And the battery cables have been attached to the power supply at the right-hand pair of screw connectors. See the next page for more details.

## *Wiring Scheme Overview for the Access Control System (non-Combi Version)*

The following drawing represents the four-screw connector on the Power Supply and the scheme for building a wiring harness and then connecting it to the power supply. In this example one Relay and one Door Lock are connected to the Access Control system. The appropriate sized wire nut should be used to connect the three common ground wires together (a Black pig-tail from the **GND** connector on the power supply, the Black wire to the Access Control Assemblies and the Black wire to a Door Lock). The appropriate sized wire nut should be used to connect the three +12 Volt wires together (a Red pig-tail from the **+12Volt** connector on the power supply, the Red wire to the Access Control Assemblies and a White +12 Volt wire to a Relay). If a second ID Reader and Door Lock are to be installed, then the additional Return Ground wire and +12 Volt wire will each need to be connected to the appropriate wire nut.

Also shown are the Battery Cables that connect to the power supply. As explained earlier in this document, **DO NOT** attach the Battery to the power supply until after the wiring harness is completed and all other devices are tested and connected to the Access Control System.
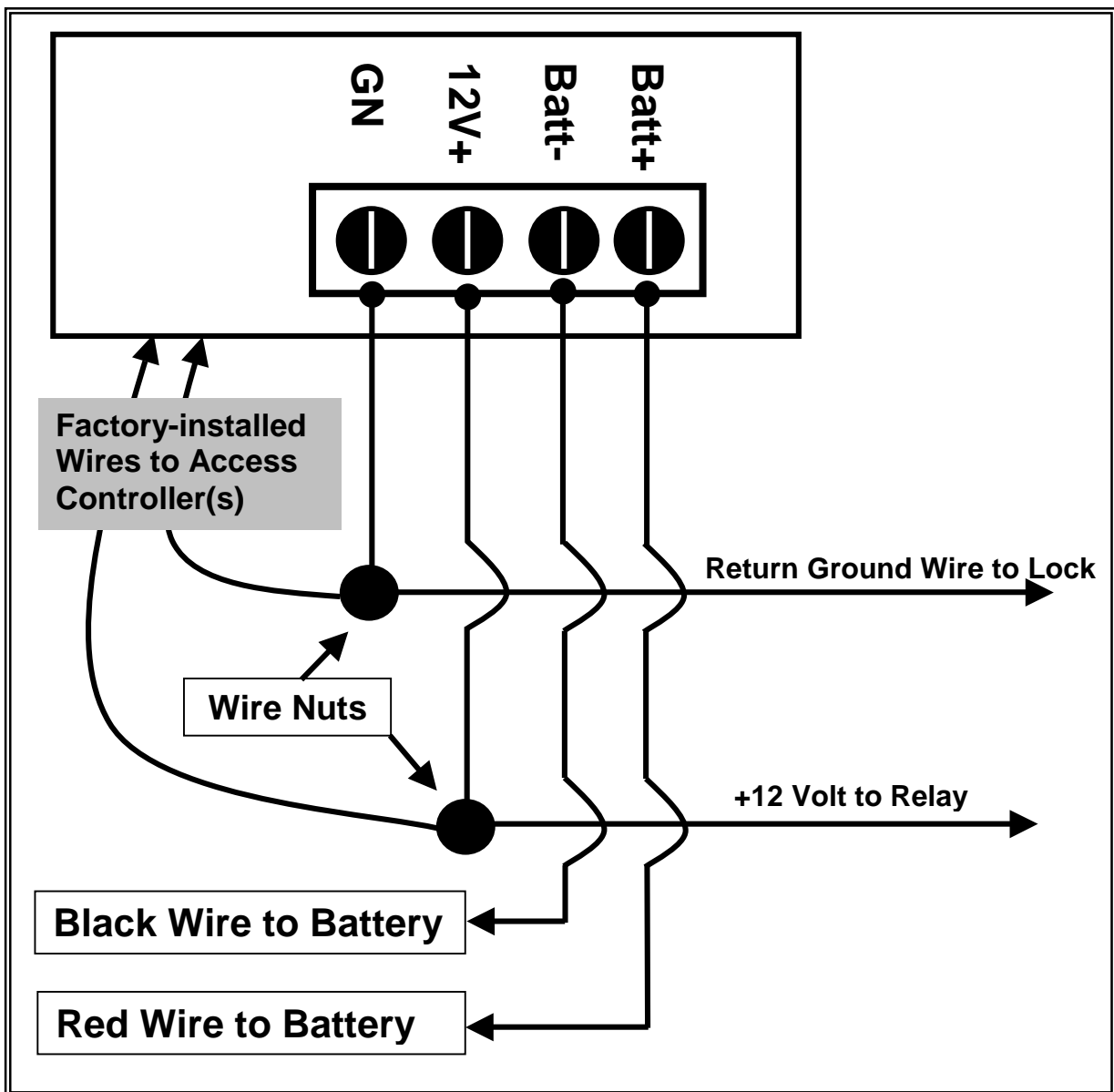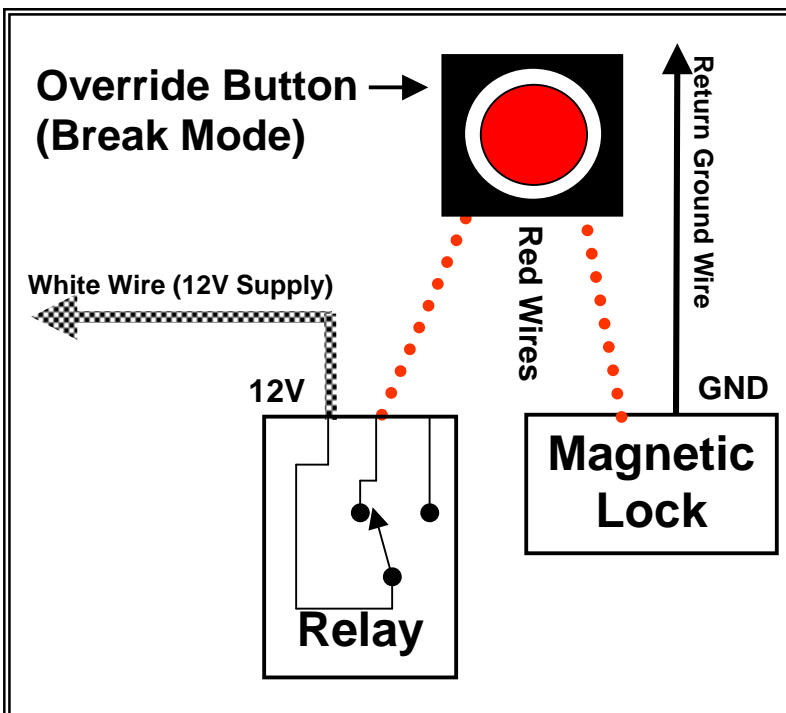
DOOR OVERRIDE BUTTON

If a door override button is required in any of the Access Control system configurations described earlier in this document, it will need to be wired one of two ways, depending upon whether a Door Strike or Magnetic Lock is being used.

Override Button → (Make Mode)

Return Ground Wire

Green Wires

White Wire (12V Supply)

12V

Door Strike or Lock

GND
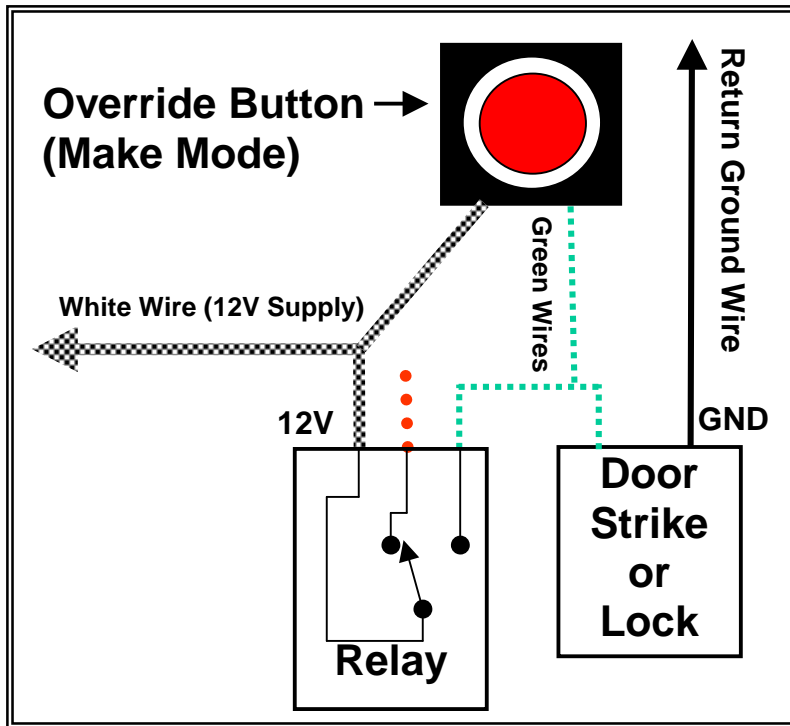
Relay

If a Door Strike or Lock is being used, then the Override Button will need to be wired in *parallel* such that, when activated, it overrides the relay (make mode) and provides +12 volts directly to the door strike, see the diagram to the left.

In this example, when the Override Button is activated, +12 volt is applied to the door strike and the door is unlocked. The door will remain unlocked for as long as the Button is held in the door open position. Some override buttons have a several second delay that allows the door to remain open for that length of time with a single activation.

Override Button → (Break Mode)

Return Ground Wire

Red Wires

White Wire (12V Supply)

12V

Magnetic Lock

GND

Relay

If a Magnetic Lock is being used, then the Override Button will need to be wired in *series* such that, when activated, it interrupts the relay (break mode) and breaks the +12 volt supply to the Magnetic Lock, see the diagram to the left.

In this example, when the Override Button is activated, the +12 volt supply is interrupted to the Magnetic Lock and the door is unlocked. The door will remain unlocked for as long as the Button is held in the open position. Some override buttons have a several second delay that allows the door to remain open for that length of time with a single activation.

ENROLLMENT READER OPTION

This option provides a dedicated Desktop ID Reader for use with administration and enrollment only. The reader fits conveniently on the administrator's desk, allowing registration of new users and amending details of existing user's ID to be carried out without the user needing to go to the location of the operational ID reader/s themselves.

This enrollment reader does not need to be connected to an Access Control system, as it requires neither a battery backup nor connection to a specific door lock or LCD screen. It only needs to communicate with the Sentinel software across the network, allowing the ID reader to be managed by the supplied Sentinel software for enrollment purposes (See separate manual for details of the software). This is done using an enrollment controller, a much smaller unit that can fit conveniently under the desk.

Note: ***If the optical USB Fingerprint Reader option has been chosen, this will not require an enrollment controller****. See the separate section at the end of this chapter for details of installation.*

The non-optical version of ID reader connects to the controller, which in turn connects to any 10/100baseT Ethernet network.

Important

The enrollment controller is configured to the network using the Sentinel software in exactly the same way as the access control boxes, please see the separate *Sentinel* manual for details.

Enrollment Reader Connections

The connections on the enrollment controller are as follows:
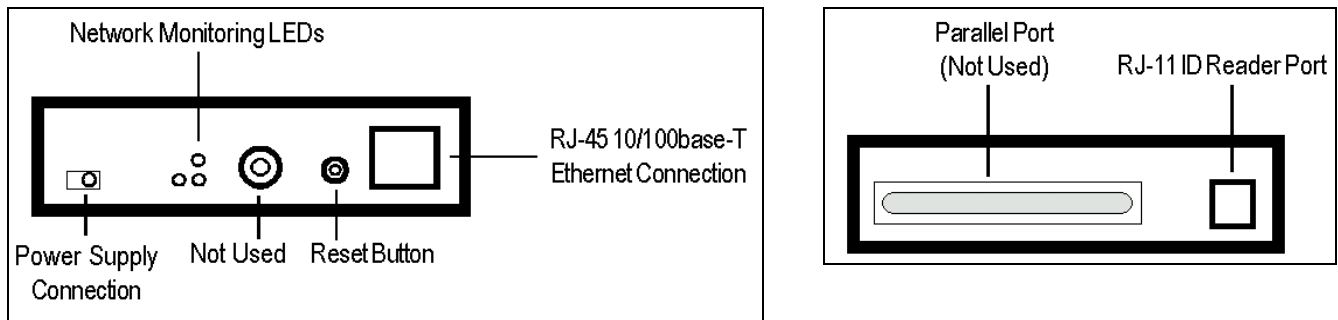
Connecting the I.D. Reader to the Controller

Connect the **RJ-11 cable** from the non-optical ID reader to the **RJ-11 Port** on the controller (located beside the parallel port as shown above).

All individual readers are supported (for example: proximity card, fingerprint, swipe card etc). Currently Combi readers are not supported.

Important
For successful use of the fingerprint reader, the fingerprint pad must be kept clean - please view the tips described in the *Fingerprint Registration* section of the *Setting Up Users for the ID Reader* chapter of the *Sentinel* manual.

ENROLLMENT READER OPTION, continued

Non-Optical Fingerprint Beep Codes

When using the fingerprint reader, the following beep codes are used:

- *One beep* – Fingerprint read successfully processed, followed by another single beep to acknowledge fingerprint authorization.
- *Four beeps* – Fingerprint is not allowed based on Group settings or Access Level / Calendar
- *Five beeps* – Fingerprint / Code not recognized.

### Optical USB Fingerprint Reader Option

Software drivers will need to be installed on the PC (this is the fingerprint reader management software that works invisibly) and is supplied with the device.

Sentinel will automatically detect the fingerprint reader and it will be ready for use.
RJ45 Display

Use if connecting a touch screen or similar to the access controller.

CONNECTING THE ACCESS CONTROLLER TO THE MAINS POWER SUPPLY

On the right side of the transformer PCBA are two monitoring LEDs:

LED's

**Red
Mains On**

**Green
Battery On**
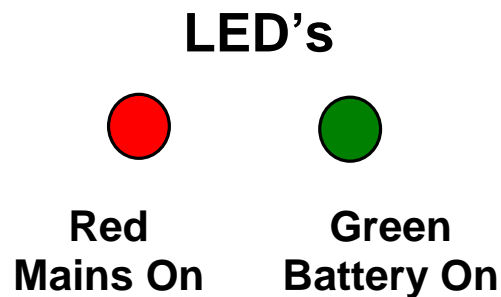
Remember to replace the protective casing before connecting the power.

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