



Electric Supply Source
for all your electrical & automation needs

TECHNICAL REFERENCE

Access control systems

Components, cabling and door references



Scope

An introductory reference based on ESS's supplied training material. Wiring examples require confirmation against the selected equipment and project design. This document does not establish a complete installation or commissioning procedure.



01 / FUNDAMENTALS

What access control protects

Purpose

Access control determines who or what may enter, view or use a resource. The design identifies the asset to protect and the people or systems authorized to access it.

Equipment and technology

Cabinets, computers, servers, network closets, copiers, printers, soda and vending machines, tool lockers, key cabinets, X-ray machines, CT scanners, MRI rooms, laboratory equipment and medical carts.

Secure areas and infrastructure

Bunkers, machine rooms, electrical rooms, mechanical rooms, telecom rooms, data centers, storage rooms, warehouses, parking garages, hotels, hospitals, schools, office suites, loading docks and restricted employee entrances.

High-security or regulated assets

Missiles, fuel pumps, drug dispensers, pharmacy storage, controlled medication cabinets, evidence rooms, cash rooms, armories, hazardous-material storage, clean rooms, research labs and critical utility controls.

Reference map

Section	Page
Operation, readers and controllers	3-4
Door hardware, monitoring and cabling	5-6
Power supplies	7
Original illustrated references	8-11

02 / SYSTEM OPERATION

From credential to access decision

Operating sequence

A user presents a credential. The reader sends credential information to the controller, which evaluates authorization and controls the access response. The supplied example depicts a contactless card. Credential and reader technologies vary.



Component	Function
Card reader	Reads a presented credential.
Access controller	Evaluates authorization and controls the lock.
Maglock or electric strike	Provides electronic locking or latch release.
Door contact	Reports whether a door is open or closed.
Request-to-exit device	Signals an exit request.
Power supply	Provides power to connected equipment.



03 / READERS AND CONTROLLERS

Credential processing

Card reader (CR)

The source specifies 22 AWG, six-conductor shielded cable for the reader. It also lists nine wire colors or positions: red, black, green, white, blue, brown, yellow, orange and shield. These descriptions are not a confirmed terminal schedule for a selected reader.

Wiring reference

Use the selected reader's documented interface and terminal assignments. The supplied color-code graphic appears in the reference appendix for review, with its original labels preserved.

Access controller

The controller receives information from the reader, determines whether access is allowed and controls the door lock. The board shown below is the example supplied in the original manual.



04 / DOOR HARDWARE

Exit devices and locking

Request to exit (REX)

The source uses RX for a motion detector or hardware-integrated exit switch and RE for a push button. These devices signal an exit request. The source describes uses involving electromagnetic locks, delayed-egress hardware and automatic door operators. The actual release sequence depends on the selected system and door design.

Exit-device cable reference

The source lists 22 AWG, four-conductor cable for RX and RE devices and describes installations using both a motion detector and a push button. Treat these as examples to confirm for the project.

Maglock (ML)

A maglock secures a door using electromagnetic force and releases when power is removed. The source identifies glass entrances and doors that are difficult to modify as example applications.

Electric strike (DS)

An electric strike installs in the frame and releases the latch when access is authorized. The source describes its use with existing mechanical locksets on commercial doors.

Lock cable reference

The source lists 18 AWG, four-conductor cable with red, black, green and white conductors. Confirm the selected hardware's requirements and the project's door-release design before use.



05 / MONITORING AND CABLING

Door status and cable references

Door contact (DC)

A sensor on the door and frame reports whether the door is open or closed. The access control system uses this status for monitoring and for forced-open or held-open event notifications. The source lists 22 AWG, two-conductor cable.

Composite cable

The source calls this “banana cable” and describes four conductor groups in one jacket. Its example totals 16 conductors. Confirm the actual product’s jacket rating, conductor construction and suitability for the installation.

Source cable example	Source device association
22 AWG, 6 conductors	Card reader (CR)
22 AWG, 4 conductors	Request to exit (RX / RE)
22 AWG, 2 conductors	Door contact (DC)
18 AWG, 4 conductors	Maglock (ML) or door strike (DS)

Abbreviations in the supplied references

CR: card reader. BR: biometric reader. DC: door contact. RX: request-to-exit motion detector or switch. RE: request-to-exit push button. ML: maglock. DS: door strike.

The source examples do not establish universal cable sizes, wire colors or pinouts.



06 / POWER

Power supplies

Purpose

An access control power supply provides regulated DC power for controllers, readers, locks, request-to-exit devices and related equipment. The source describes typical outputs of 12 VDC or 24 VDC.

Features described in the source

Battery backup can support continued operation during a power interruption. Overload, short-circuit and surge protection are examples of features described in the original material. Confirm the features of the selected supply.

Equipment selection

Match the power supply and connected devices to the project documentation. The product images and wiring references in this manual illustrate the supplied material, without establishing a product-specific design.



Reference drawings follow

The next four pages retain the original illustrated references. Labels, wire colors and diagrams remain as supplied. Confirm device-specific details before applying them.



APPENDIX / ORIGINAL REFERENCE ARTWORK

Reader color-code example

HID readers use standard Wiegand communication. Colors may vary slightly by model, but the most common wiring is:



COLOR	SIGNAL	DESCRIPTION
RED	+VDC	Positive Power (+)
BLACK	GND	Ground (-)
GREEN	DATA 0	Wiegand Data 0
WHITE	DATA 1	Wiegand Data 1
BLUE	LED	LED Control (Active Low)
BROWN	BUZZER	Buzzer Control (Active Low)
YELLOW	HOLD	Hold / Extra Input (Optional)
ORANGE	TAMPER	Tamper Switch (Optional)
SHIELD	DRAIN	Cable Shield / Drain (Connect to GND)



Note: Always verify with the specific reader's datasheet. Use a multimeter to confirm wiring if needed.

Original reference artwork supplied by ESS. Wire colors, terminal labels and release circuits require confirmation against the selected equipment and project design.



APPENDIX / ORIGINAL REFERENCE ARTWORK

Illustrated system overview

1 WHAT IS ACCESS CONTROL?

Access control is a security system that allows or denies entry to certain areas based on authorization. It helps protect people, assets and information.



2 HOW IT WORKS



1. Present Card or Credential
2. Reader Sends Information to Controller
3. Controller Checks Authorization
4. Access Granted or Denied

**ACCESS GRANTED**
Door unlocks and access is allowed.

**ACCESS DENIED**
Door remains locked and access is denied.

3 COMMON COMPONENTS



Card Reader Controller Door Lock (Magnetic Lock) Exit Button Power Supply (12/24 VDC)

4 TYPICAL HID CARD READER COLOR CODE

HID readers use standard Wiegand communication. Colors may vary slightly by model, but the most common wiring is:



COLOR	SIGNAL	DESCRIPTION
RED	+VDC	Positive Power (+)
BLACK	GND	Ground (-)
GREEN	DATA 0	Wiegand Data 0
WHITE	DATA 1	Wiegand Data 1
BLUE	LED	LED Control (Active Low)
BROWN	BUZZER	Buzzer Control (Active Low)
YELLOW	HOLD	Hold / Extra Input (Optional)
ORANGE	TAMPER	Tamper Switch (Optional)
SHIELD	DRAIN	Cable Shield / Drain (Connect to GND)

 Note: Always verify with the specific reader's datasheet. Use a multimeter to confirm wiring if needed.

5 QUICK TIPS



Keep doors secure and cables protected.



Use high quality power supply. (12/24 VDC)



Test the system after installation.



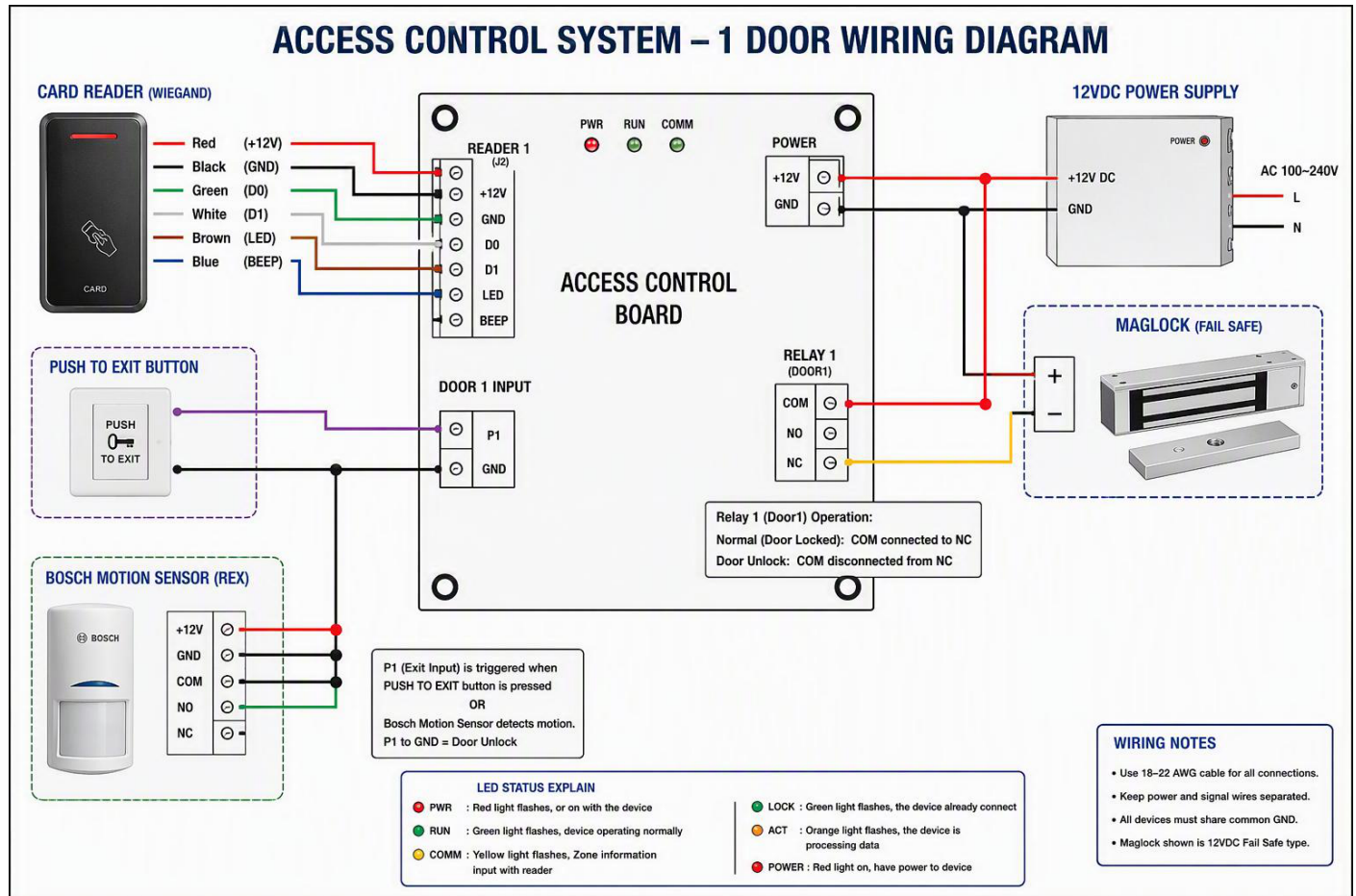
Manage users and permissions regularly.

 **REMEMBER:** Access control is about the right person, at the right place, at the right time.

Original reference artwork supplied by ESS. Wire colors, terminal labels and release circuits require confirmation against the selected equipment and project design.

APPENDIX / ORIGINAL REFERENCE ARTWORK

Single-door wiring example



Original reference artwork supplied by ESS. Wire colors, terminal labels and release circuits require confirmation against the selected equipment and project design.

