HOW TO.

Calculate power requirements for AXIS A1710-B and A1810-B Network Door Controllers

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Introduction

This guide helps you calculate the power requirements for AXIS A1710-B and A1810-B Network Door Controllers. It is designed for system integrators, installers, and technical professionals who need to ensure a stable and efficient power supply when planning door access control installations. Understanding how to size power input relative to output demand ensures system reliability, safety, and performance.

Prerequisites

AXIS A1710-B or AXIS A1810-B Network Door Controller

12V DC Power unit

Network Switch (PoE or Network only)

Power Overview:

Both AXIS A1710-B and A1810-B Network Door Controllers offer flexible power input and output options to accommodate various installation environments. While PoE input may be available in some contexts, DC input is mandatory for powering onboard relays, the reader, and external devices.

Power input options

- DC power input (**required**):

  DC power is **mandatory** to supply power to external door devices such as locks (via onboard relays), readers, and Request-to-Exit (REX) devices. All DC input terminals can be connected to the same power source, and the included Wago splitter simplifies wiring for shared input.

  Important: Actual power requirements vary depending on the number and type of connected devices (e.g., electric strikes, maglocks, high-power readers).

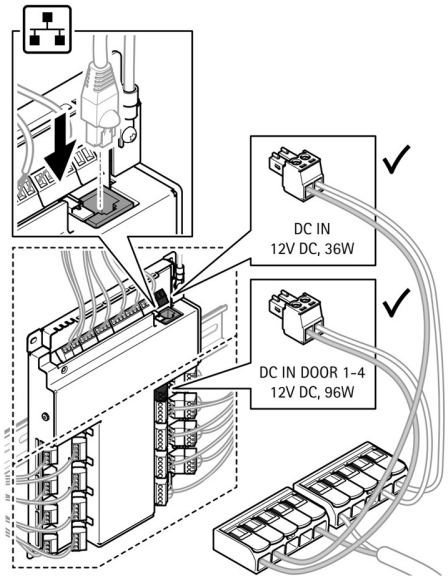
  Always size your power supply based on the total current draw of all connected components, not just the controller.

  The maximum power draw per DC input (to enable full power output) is shown in the diagram below.

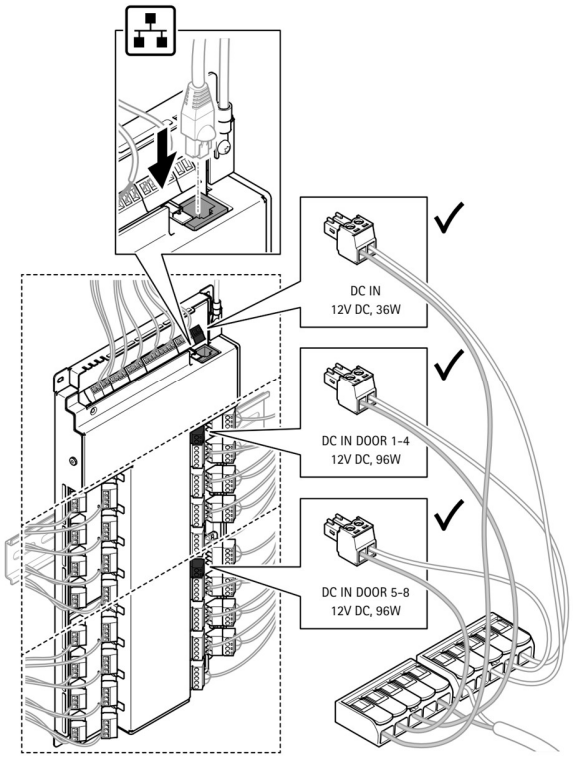
- Power over Ethernet (PoE):

  PoE+ (IEEE 802.3at) or PoE (IEEE 802.3af) can be used to power the controller's internal electronics, network communication and auxiliary inputs and outputs (AUX I/Os), but it **cannot supply power** to external door devices such as locks, readers, or REX inputs.

  If using PoE, a separate **DC power source** is still **required** to power the reader, REX, and to operate the relay used for controlling or powering the locks. The AUX I/Os, however, can be powered directly via PoE and do not require additional DC power.



A1710-B Power input



A1810-B Power input

Power out options

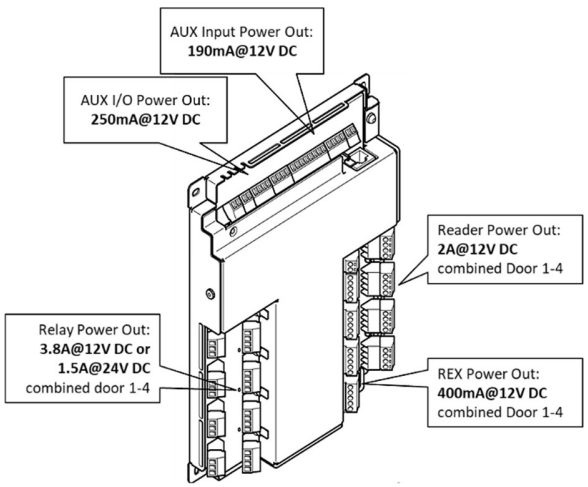
NOTE All specifications listed below refer to a **4-door combined** setup, except for the Aux Outputs section.

- Relay Outputs: For controlling door strikes or magnetic locks.
    - Dry or wet output, 12V DC/ 24V DC, jumper configurable.
    - Max 3.8A@12V DC or 1.5@24V DC for wet relay application.
    - Max 5A@30V DC for dry relay application, external power must be supplied to the lock.

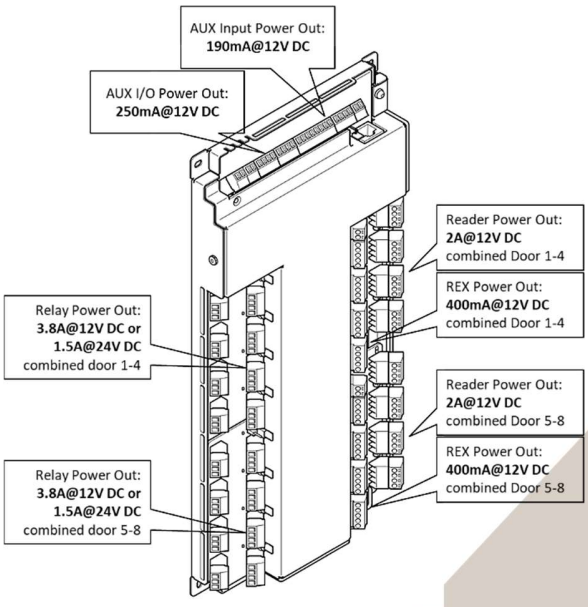
- Reader Ports: Supplies power to card readers (12V DC regulated)
    - Maximum combined current output across 4x reader ports is 2A@12V DC
    - Typical reader power is max 250mA@12V DC.
    - Make sure to check the reader's current rating—multiple high-draw readers may exceed the available output.

> Overloading the reader's power budget can cause instability or communication issues.

- REX (Request to Exit): Optional powered output (e.g., PIR sensors)
    - Maximum combined current across 4x door input ports is 400mA@12V DC.
- AUX I/Os Outputs: Power to auxiliary devices (e.g., status LEDs, alarms)
    - Designed to provide 12 V DC power and/or signal triggering for additional low-power devices
    - With limited current output (e.g., 100-200mA per output), always check the product specification for exact values.



A1710-B Power output



A1810-B Power output

Power Calculation

Key rules

Make sure your total DC power input can handle the combined load of **all connected devices**, plus **extra** for safety. Always account for:

- Conversion Losses: Power supplies aren't 100% efficient—leave room for 10–15% loss.
- Aging & Wear: Components degrade over time
- Temperature Impact: Heat or cold can affect performance

Size your power supply with at **least 20%** extra capacity beyond the total load.

The formula:

Total DC Power In = Locks + Readers + REX + AUX I/Os + System base + Buffer

Components Breakdown:

- Locks: Total current draw of all connected electric strikes, maglocks, etc.
- Readers: Combined current required for all card readers (typically 100–250 mA each).
- REX: Power for motion sensors or touchless exit devices (if powered via controller).
- AUX I/Os: LEDs, buzzers, alarms, or any devices connected to auxiliary inputs.
- System Base Load: The controller's own internal power needs (typically 150–300 mA).
- Buffer: Add 20–35% extra to account for conversion losses, aging, and environmental factors.

Example Scenarios

The following examples illustrate typical power requirements for different installation setups using AXIS A1710 and A1810. These scenarios help estimate the total DC input needed based on the number and type of connected devices. Always adjust based on actual hardware specifications and installation conditions.

A1710-B 4 doors installation					
Applications	**Scenario 1** (Per door) 1x reader 1x wet relay 1x PIR REX	**Scenario 2** (Per door) 1x reader 1x dry relay 1x PIR REX	**Scenario 3** (Per door) 1x reader 1x dry relay 1x REX button	**Scenario 4** (Per door) 2x reader 1x wet relay	**Scenario 5** (Per door) 2x reader 1x dry relay
Reader Power out max	**12W** (1A@12V DC) shared for 4x readers	**12W** (1A@12V DC) shared for 4x readers	**12W** (1A@12V DC) shared for 4x readers	**24W** (2A@12V DC) shared for 8x readers	**24W** (2A@12V DC) shared for 8x readers
Door relay Power out max	**46W** (3.8A@12V DC or 1.5@24V DC) shared for 4x relays	N/A (external power supply)	N/A (external power supply)	**46W** (3.8A@12V DC or 1.5@24V DC) shared for 4x relays	N/A (external power supply)
REX Power out max	**5W** (400mA@12V DC) shared 4x REXs	**5W** (400mA@12V DC) shared for 4x REXs	N/A	N/A	N/A
AUX I/Os Power out max	**5W** (400mA@12V DC) Shared for Aux input/outputs	**5W** (400mA@12V DC) Shared for Aux input/outputs	**5W** (400mA@12V DC) Shared for Aux input/outputs	**5W** (400mA@12V DC) Shared for Aux input/outputs	**5W** (400mA@12V DC) Shared for Aux input/outputs
System* Power ≈	**3W**	**3W**	**3W**	**3W**	**3W**
Buffer** Power (20-35%)	**19W**	**5W**	**4W**	**18W**	**10W**
Total DC Power input (Min required)	**90W** (7.5A@12V DC)	**30W** (3A@12V DC)	**24W** (2A@12V DC)	**96W** (8A@12V DC)	**42W** (3.5A@12V DC)

A1810-B 8 doors installation					
Applications	**Scenario 1** (Per door) 1x reader 1x wet relay 1x PIR REX	**Scenario 2** (Per door) 1x reader 1x dry relay 1x PIR REX	**Scenario 3** (Per door) 1x reader 1x dry relay 1x REX button	**Scenario 4** (Per door) 2x reader 1x wet relay	**Scenario 5** (Per door) 2x reader 1x dry relay
Reader Power out max	**24W** (2A@12V DC) shared per 4x readers	**24W** (2A@12V DC) shared per 4x readers	**24W** (2A@12V DC) shared per 4x readers	**48W** (4A@12V DC) shared per 8x readers	**48W** (4A@12V DC) shared per 8x readers
Door relay Power out max	**92W** (3.8A@12V DC or 1.5@24V DC) shared per 4x relays	N/A (external power supply)	N/A (external power supply)	**92W** (3.8A@12V DC or 1.5@24V DC) shared per 4x relays	N/A (external power supply)
REX Power out max	**10W** (400mA@12V DC) shared 4x REXs	**10W** (400mA@12V DC) shared per 4x REXs	N/A	N/A	N/A
AUX I/Os Power out max	**5W** (400mA@12V DC) Shared for Aux input/outputs	**5W** (400mA@12V DC) Shared for Aux input/outputs	**5W** (400mA@12V DC) Shared for Aux input/outputs	**5W** (400mA@12V DC) Shared for Aux input/outputs	**5W** (400mA@12V DC) Shared for Aux input/outputs
System* Power ≈	**4W**	**4W**	**4W**	**4W**	**4W**
Buffer** Power (20-35%)	**33W**	**11W**	**9W**	**37W**	**15W**
Total DC Power input (Min required)	**168W** (14A@12V DC)	**54W** (14A@12V DC)	**42W** (3.5A@12V DC)	**186W** (15.5A@12V DC)	**72W** (6A@12V DC)

NOTE *: System power refers to the controller's own base load, even when in idle mode. This must be included in the total power calculation.
**: Additional power margin (20–35%) is recommended to account for peak inrush current and worst-case operating conditions, such as low input voltage, high load, or extreme temperatures.

Power output protection

AXIS A1710 and A1810 controllers are equipped with electronic fuses (**eFuse**) on all major power outputs, including relay lock power, reader power, REX, and AUX outputs. These advanced protection components offer:

- Fast over-current shutdown
- Inrush current limiting
- Over-voltage protection
- Fault flag indicators for diagnostics

An eFuse is an integrated circuit that provides resettable overcurrent and overvoltage protection. Unlike traditional fuses that permanently break when overloaded, eFuses can reset automatically once the fault is cleared—no manual replacement required.

Key benefits of eFuse technology

- Instant protection response to prevent hardware damage
- Automatic recovery after fault resolution—no downtime
- No need for service calls to replace blown fuses
- Enhanced safety during installation and power surges

This built-in protection helps ensure long-term reliability, especially in mission-critical access control environments where interruptions and manual servicing are not acceptable.

Summary

When planning power for AXIS A1710-B or AXIS A1810-B installations:

- Start with the total power output requirements (locks, readers, REX, AUX I/Os, etc.)
- Add the controller system load and power margin for safe headroom
- Select a power supply that matches or exceeds total DC input requirements (voltage + current)

A properly sized and protected power system ensures stable, reliable operation in all conditions.

Considerations and limitations

For full technical specifications, power budgets, and detailed current ratings, always refer to the official product datasheet:

https://www.axis.com/products/axis-a1710-b

https://www.axis.com/products/axis-a1810-b

These resources include up-to-date information on port power limits, voltage settings, and recommended installation practices.