A Guide to Door Hardware for Security Professionals

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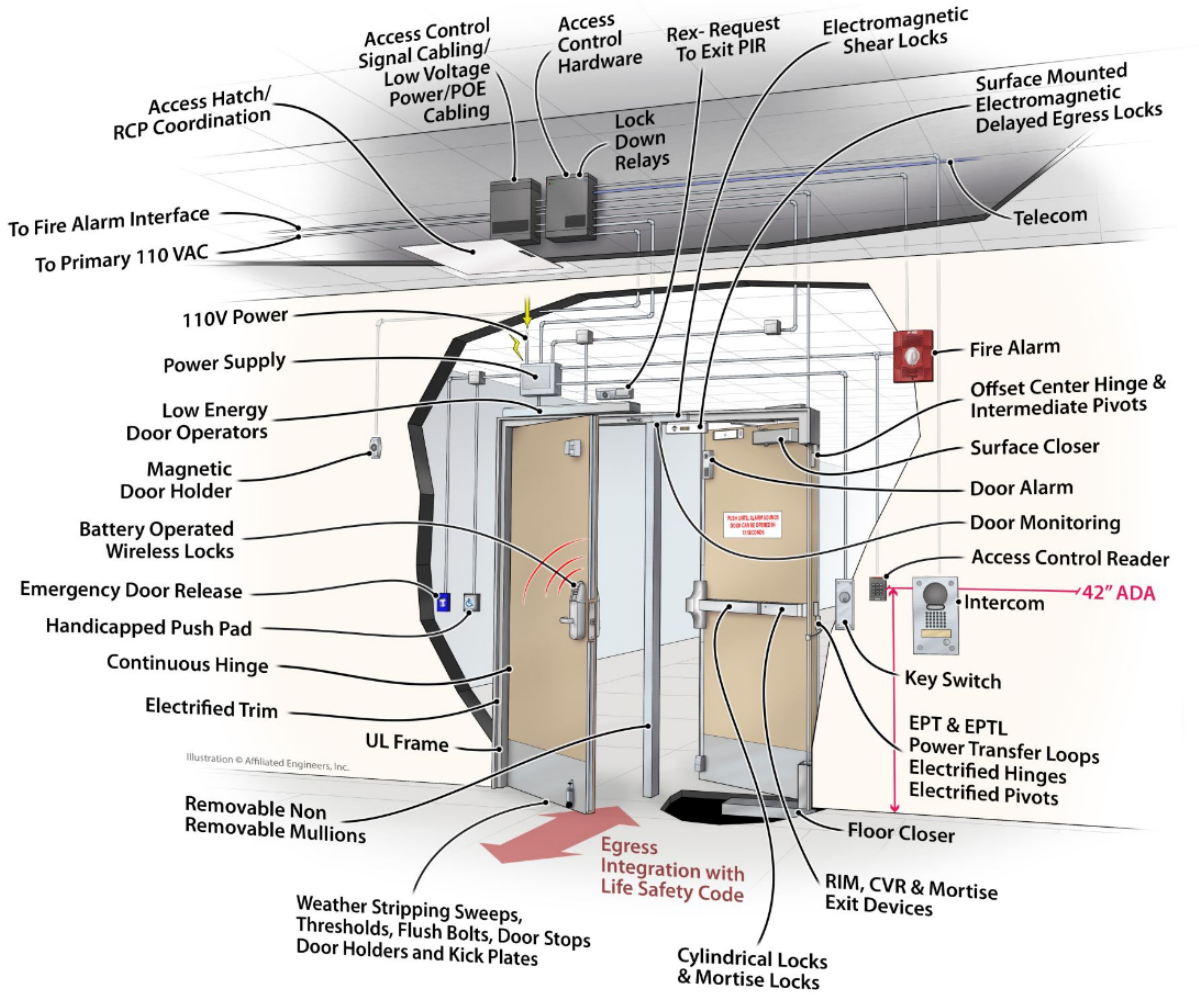
What's so complicated about door hardware?



(Special thanks to Affiliate Engineers, Inc. for the use of this diagram)

The above question is a question I'm constantly asked! I'd argue most people don't understand how important door hardware is until it is no longer working properly. But, I love looking at the questioner's face when I show this diagram because they really had no idea how complex door hardware could get.

Door hardware can be complicated and complex, but it doesn't have to be! That is why we are writing up this resource. This basic door hardware resource is to help simplify and educate the security industry on the importance of door hardware and how it interacts with the rest of the industry.

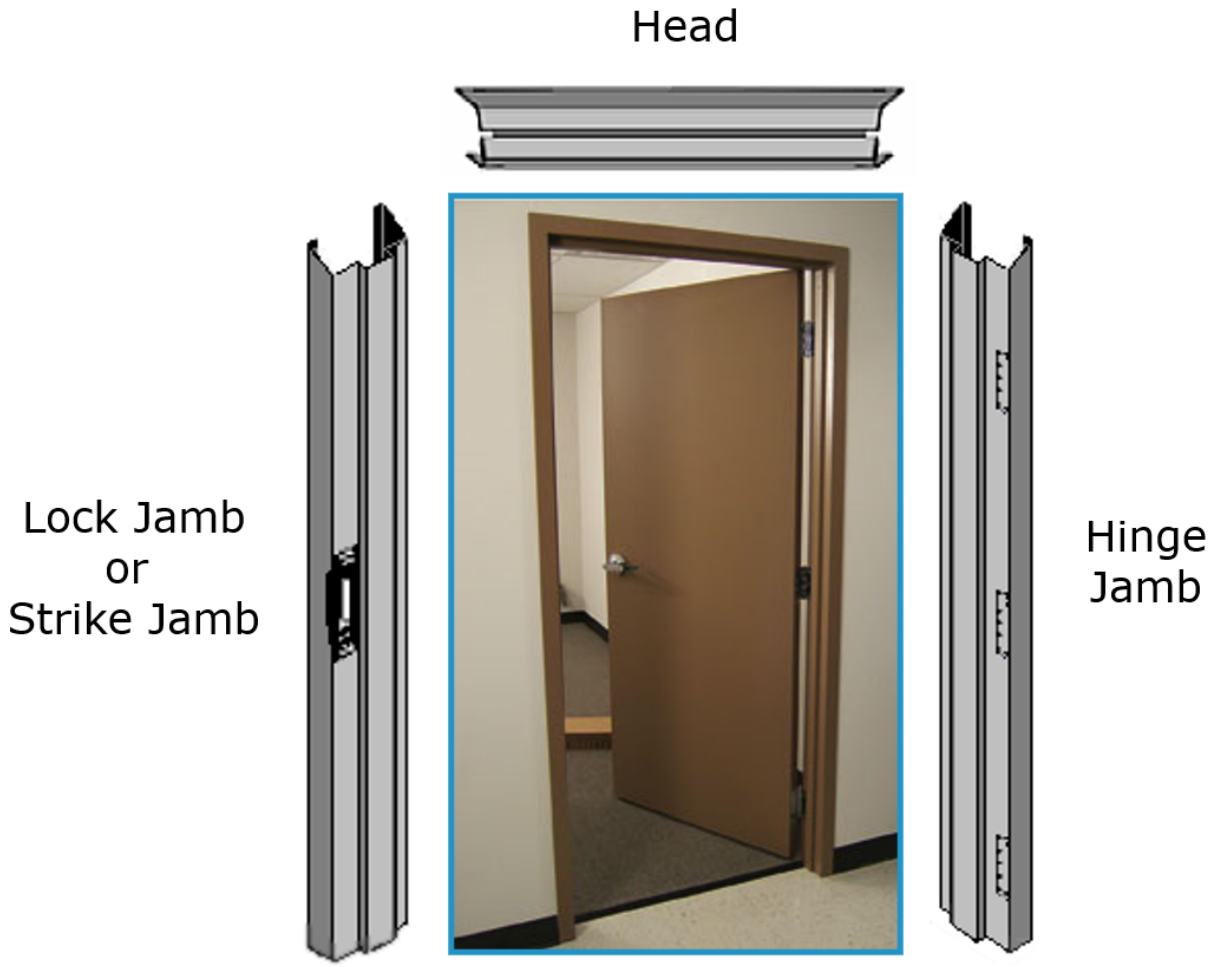
This might seem like basic information, but understanding the anatomy and some of the language used in the door hardware industry will help you bridge the gap to the rest of the security industry.

So let’s break down and simplify the parts of a door:

The Frame

Without a frame, we wouldn't have a door. So let’s start there!

Frames can be made out of many different materials, but the most common in commercial applications are made out of steel. Your typical frame has 3 major parts: the Head, Lock Jamb (Strike Jamb), and the Hinge Jamb.

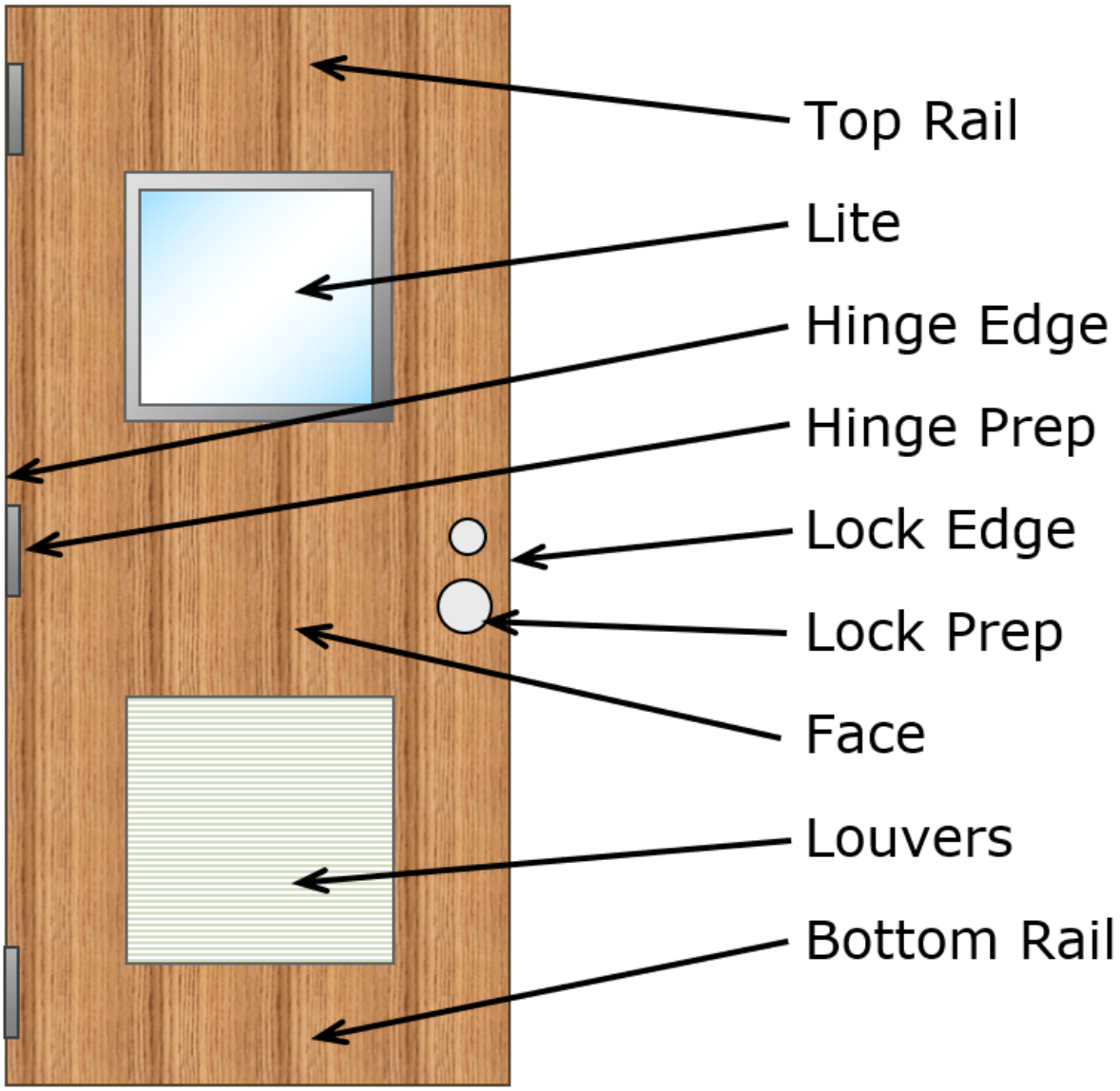


The frame creates a sturdy foundation for a door to be installed. If the frame is out of whack, most likely you’ll have door alignment issues causing the door to not close or latch properly.

From a security perspective, if a frame hasn’t been properly installed or anchored to the wall an intruder could pry open the door without needing to defeat the lock or break in the door.

The Door

Before we look at all of the hardware components of a door let's break down the door itself.



As a security professional, you'll probably never need to know all of these terms – but knowing the type of Lock Prep can help you specify what type of access control lock or electrified hinge to use for your wire run.

Building on that, Lites and Louvers, if not installed correctly, could be a point of unwanted access so it's important to make sure all set screws are installed on the secure side of the door.

The Hardware

The DHI (Door and Hardware Institute), the largest Door Security Association, helps set standards and best practices for the industry and has a standard for the proper sequential order when specifying door hardware.

You'll find this standard written into every door hardware set and schedule. We thought it might make sense to break down the parts of a door in that order. Before we get started, let's start with some common definitions for hardware you will likely interact with.

Mechanical Door Hardware Quick Definitions:

Exit device - An exit device, also known as a panic bar, push bar, or crash bar, is architectural hardware that opens a door when someone pushes a bar.

Mortise lock - A lock that is set within the body of a door in a recess or mortise, as opposed to one attached to the door surface. These locks are valued for their durability, versatility, and sturdiness over time.

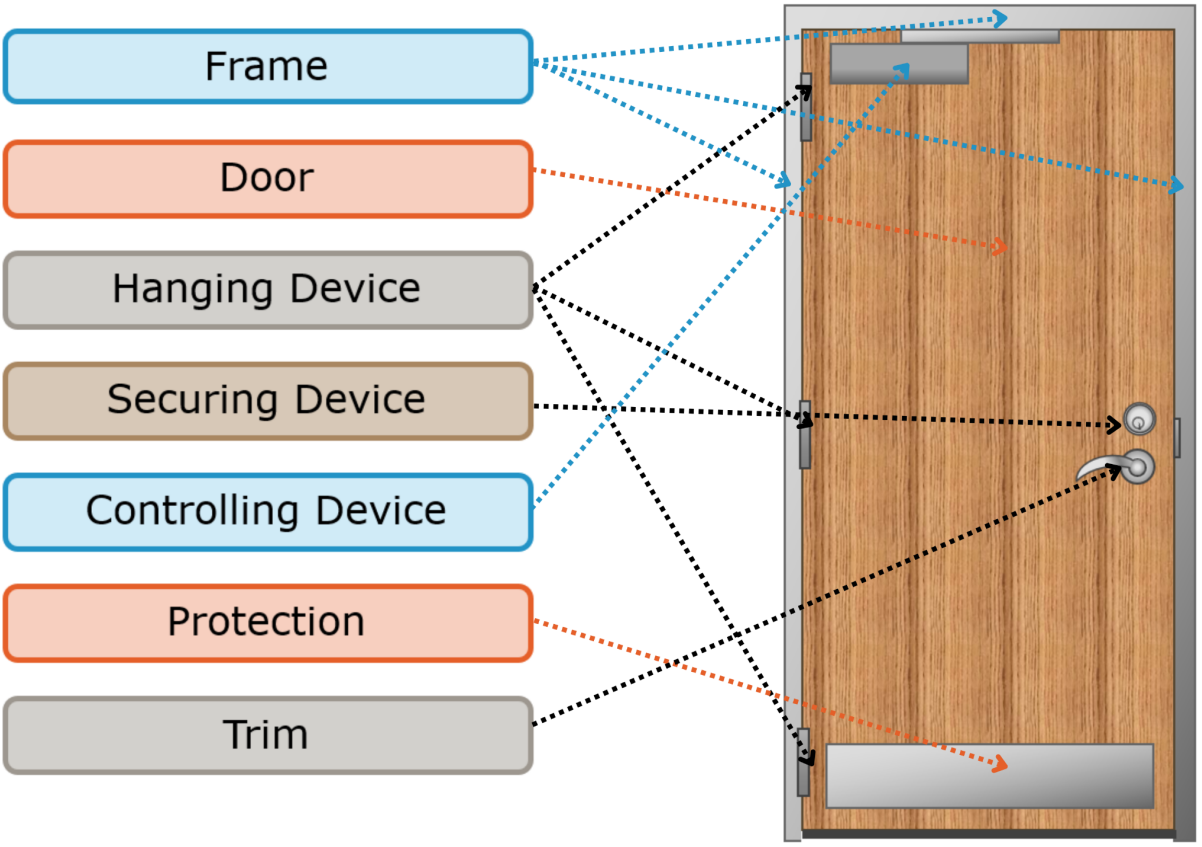
Cylindrical lock - The most common lock there is - these locks get their name from the cylindrical hole bored into the face of the door and the smaller profile prep on the edge of the door for the latch bolt. These locks are commonly used for their ease of installation, versatility, and less intensive prep than the mortise lock.

Door closer - A door closer is a mechanical device that closes a door in a controlled manner, preventing it from slamming, after it is opened. The force used to open the door is stored in a type of spring and when released, this energy is then used to return the door to a closed position.

Now that we have gotten some basic hardware-defined, let's get a little deeper into the world of hardware.

The DHI Standard for the proper sequence for specifying a door is: Hang the door, secure the door, control the door, and protect the door.

1. **Hang the door** - You can't just throw a door into a frame and expect it to start swinging. Some ways to hang the door might include - *hinges, continuous hinges, and pivots.*
2. **Secure the door** - Depending on how you want the door to operate, most of the time you need some kind of locking device on the door. The three you'll most likely run into are *cylindrical locks, mortise locks, and exit devices* (vertical rods, concealed vertical rods, and rim devices).
3. **Control the door** - Specific codes can require your door to be self-closing. Having a *door closer or auto operator* on your door can help you control the swing of your door.
4. **Protect the door -** It might seem silly to "protect" a door… until you've seen what a hospital bed can do to it! *Kick plates, push plates,* and other trim can be found in this section.



You might be asking, 'Why are you telling me about these sequences and how does door hardware apply to the overall security of my building?'

Let's dive deeper into each section of the door and highlight some of the security vulnerabilities and concerns.

Hang the door: Hanging the door is a critical part of the door - and one that may be taken for granted by the general public. When referring to the hanging of the door, we refer to the manner in which the door is fastened to the frame. The 3 most common hardware types you'll find to hang the door are - Hinges, Continuous Hinges, and Pivots.

- **Hinges** may be a familiar concept from the doors of your own home. But these hinges are vastly different from hinges that would be used in a commercial environment. Standard ball-bearing hinges are what is most often specified for an "average" door. In certain cases, heavy-weight ball-bearing hinges may be required for high-traffic or heavier doors.
- **Continuous Hinges** span the length of the door and spread the load of the weight of the door along the entire length of the frame. This can eliminate the issue of a door sagging over time.
- **Door Pivots** are commonly used on oversized, heavy doors and aluminum storefront openings. They balance the weight of the door on heavy-duty pivots to make opening and closing these doors easy.

Hinges work in conjunction with the rest of the hardware on a door to create a safe opening. Ensuring you are using the right hinges for the right opening also has implications for fire safety. For more information, reach out to a local Architectural Hardware Consultant (AHC).

Secure the door:

When one thinks about door hardware, the most common product that comes to mind is the door knob. While the evolution of building codes has led to the near eradication of the door knob in the commercial setting, locking hardware, such as the doorknob, is an incredibly important piece of the overall hardware equation.

For locking hardware (whether it be panic/exit hardware or a lock) there are many different ***functions***.

- For example, you may want a door to always remain locked when the door is in a closed state. This is known as a "storeroom" function.
- For an exit device, you may want the door to serve as an emergency exit but have no access from the outside. This would be an "exit only" function.

Depending on the manufacturer and the type of hardware, there are numerous types of functions available.

Why is this important? Securing the door is not just about securing property and possession and controlling who can access a physical space. Securing the door also encompasses ensuring that people are able to exit in the case of an emergency.

These 5 functions capture a majority of what is specified for locking hardware:

- **Passage** - The latching mechanism can be unlocked by any side of the lever/knob at any time. Think of a hall closet application.
- **Privacy** - Both levers will retract the latching mechanism unless the outside lever is locked by a button on the inside lever. Think of a restroom door.
- **Storeroom** - The outside lever remains locked at all times and the latch bolt is only operated by use of the key. It remains locked once the key is removed. The inside lever stays unlocked for free egress at all times.
- **Classroom** - The outside lever is locked or unlocked with a key and will remain that way unless changed again by use of the key. The inside lever always remains unlocked for free egress.
- **Entrance** - Both the inside and outside trim will operate the latch unless the door is locked by a key on the outside.

Control the door: Why would we want to control the operation of a door?

Well, to start - **fire doors!** NFPA 80 and your local state codes from the IBC (International Building Code) - require that fire-rated doors must close automatically and latch. Fire doors are there to contain fire & smoke and prevent them from spreading throughout the building. Ensuring the door can safely close and latch buys time for the fire department and saves the loss of life and property.

Another consideration that may seem obvious, is **security.** Why spend thousands of dollars on an access control system if you cannot even accomplish the simple task of ensuring your door closes and latches? Ensuring that your closers are adjusted for wind conditions, stack pressure, and other environmental concerns is another key element. This leads to **safety** concerns. We often take for granted the fact that most doors are so

well controlled. If a hollow metal door with a misadjusted closer or no closer at all is shut, someone could be seriously injured. You may think that this sounds ridiculous, but children or the elderly may not be able to react quickly enough to shield themselves from harm from a rogue door.

When it comes to the Americans with Disability Act (ADA) we also want to ensure that the **accessibility** of the building is a consideration at the top of mind. Ensuring that all entrants of a building can safely access it is another consideration we take for granted.

Protect the door:

Protecting the door is primarily about ensuring the physical composition of the door holds up over time. **Kickplates** are a common product used to protect the door from damage on the lower third of the door caused by, frankly, kicking! Reinforcers or other protection plates may be added to an opening for added security and to lengthen the door's useful life in the field.

Other accessories such as weatherstripping, seals, and gasketing protect the occupants of a room from the threat of smoke during a fire, help to control the temperature within a room, and can even offer soundproofing properties.

Ultimately, this document is just a minor foray into the vast world of doors and door hardware. With the knowledge gained from this, we hope you are better equipped to serve your customers, clients, or facility. Some other topics that we did not have the scope to cover, but are critical to the success of an opening are: life safety and fire code, access control, ADA considerations, and many of the finer points on each individual silo that we covered.

Want to learn more about Door Hardware in the physical security industry? Here are some additional resources:

https://www.dhi.org/

https://www.allegion.com/corp/en/index.html

https://www.assaabloy.com/group/en

https://www.dormakaba.com/us-en