



An Extended Guide · No. 1844

Power over Ethernet for Cameras — Switches, Watts & Cable Runs

One cable for power and video — sizing
the switch and respecting the limits

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! Read this first — it's about people, not just pictures

Before the gear, a word that matters more than any camera: with a business you are recording other people — customers, staff, people walking by — so where you point a camera, and whether it picks up sound, is as important as the picture. As a rule, keep cameras on general work and public areas, never on restrooms, changing areas, or anywhere someone expects privacy, and be very careful about recording audio. This guide gives you plain-English general information, not legal advice. For your own situation — especially anything to do with employees, audio, or the law — check with an attorney who knows Ohio. Running cable means opening walls and ceilings, so plan the routes with an eye on privacy before anyone drills a hole.

One cable that carries both power and picture

Here's the tidy idea behind most business camera systems: a single network cable can carry both the power a camera needs and the video it sends, all at once. It's called Power over Ethernet — PoE for short — and understanding it saves you money, headaches, and a lot of confusion.

I'm Bill, and I run Bill's Home Tech here in Portage County, Ohio. I've spent 30+ years making technology feel simple for folks, in plain language and at your pace. PoE sounds technical, but the whole thing comes down to one cable, one switch, and a couple of limits to respect.

This is where a lot of camera plans go sideways — a switch that can't power all the cameras, or a cable run that's too long and drops out. Get these few ideas right and your wired cameras will just work, steadily, for years.

★ The wiring is the part I coordinate

I'm a tech helper, not a licensed low-voltage contractor. I'll help you plan the runs, pick the switch, and set it all up — and for pulling cable through finished walls I line up a trustworthy local pro. Questions? Call or text me at (330) 200-8042.

The whole guide, on one page

If you remember only these things, PoE will never trip you up.

- ❑ PoE sends both power and video over one network cable, so there's no separate power plug at each camera.
- ❑ Your cameras plug into a PoE switch, which supplies the power and ties them together.
- ❑ A switch has a total power budget shared across all its ports — it must supply enough for every camera plugged in.
- ❑ Cameras vary in how much power they draw, so add up the makers' figures and leave headroom.
- ❑ One cable run tops out around 100 meters — about 328 feet. Past that, add a switch or extender partway.
- ❑ For a building full of cameras, wired PoE is steadier than Wi-Fi.

✓ One rule to hold onto

Add up what your cameras need, then buy a switch with room to spare — never one that's exactly full. Headroom costs a little now and saves you from swapping the switch the day you add a camera.

What Power over Ethernet actually means

Strip away the jargon and PoE is simple: the same cable that carries the camera's video also carries its electricity.

A normal network cable — the kind with the clip that goes 'click' — has more wires inside than the video alone needs. PoE puts electricity on the spare capacity, so one cable does two jobs. The camera gets its power and sends its picture back through that single run. No electrician at the camera, no power outlet up on the wall or soffit.

That's the beauty of it for a business. You run one tidy cable from the camera back to a switch in your equipment spot, and that's the whole connection — power and video together. It's why professional camera installs almost always use it.

Why owners like it

- One cable per camera — less drilling, less mess, less cost.
- No power outlet needed at the camera, even high on a wall or outside.
- Power and video arrive together, so setup is simpler.
- A backup battery on the switch keeps every camera running in an outage.

★ That last one is a quiet gem

Because every camera draws its power from the switch, a single small backup battery on that switch keeps your whole system recording through a brief outage. Try doing that with a dozen separate wall plugs.

The switch — the heart of a PoE system

If PoE has a hub, it's the switch. Every camera plugs into it, and it hands out both the power and the network connection.

A PoE switch is a box, usually in your equipment closet, with a row of ports. Each camera's cable plugs into a port, and the switch powers that camera and ties it into the system. From the switch, one more cable goes to your recorder (or your network) so the video has somewhere to land.

Switches come with different numbers of ports — think of ports as parking spaces for cameras. You want enough spaces for the cameras you have **plus** a few empty ones for the cameras you'll add. An eight-camera system on an eight-port switch leaves you no room; the next camera means a whole new switch.

✓ Count ports like parking spaces

Buy a switch with a few more ports than cameras you have today. Empty ports are cheap; replacing a full switch the day you add one camera is not. The same goes for the power budget we'll talk about next.

The power budget — a switch's most-missed spec

Here's the number people forget, and the one that causes the most head-scratching: a switch has a total power budget shared across all its ports.

A PoE switch can only hand out so much power in total, and that total is split among everything plugged in. Picture a power strip with a limit: it doesn't matter that there are eight outlets if the whole strip can only feed so much at once. Plug in cameras that together ask for more than the switch can give, and some won't power up, or the switch struggles.

So a switch has two numbers that both matter: how many ports it has, and how much total power it can supply. A switch can have plenty of empty ports and still be 'full' on power. When you shop, read the total power figure, not just the port count.

! Ports full, power empty — the classic trap

A common call I get is a camera that won't come on, on a switch with free ports. Almost always the switch has run out of **power budget**, not ports. Sizing the budget up front avoids the whole mess.

How to size the switch's power — without guessing

You don't need to be an engineer. You just add up what your cameras ask for and leave yourself a cushion.

Cameras vary in how much power they draw. A simple fixed camera sips a little; a camera with a heater for winter, a bright night-light, or a motor that pans and tilts can draw a good deal more. Because they vary, there's no single number — the honest way is to look up each camera maker's stated power figure and add them together.

Then, crucially, don't buy a switch whose total budget just barely covers that sum. Leave headroom — a comfortable margin above your total — so the switch runs easy, handles the hungriest moments (a cold night with every heater on), and has room for the camera you add next year.

The sizing habit, in order

- List every camera and its maker's stated power draw.
- Add those figures up for your total.
- Pick a switch whose total power budget comfortably exceeds that total.
- Leave extra for growth and for cameras that draw more in winter.

★ Send me your camera list

Text me the makes and models you're considering and I'll help you add up the power and pick a switch with sensible headroom — no guesswork, no swapping it out later. Call (330) 200-8042.

How far one cable can go: about 100 meters

Network cable is generous, but it does have a limit. Knowing it keeps a far-flung camera from mysteriously dropping out.

A single run of network cable has a practical limit of about 100 meters — roughly 328 feet — for carrying power and data reliably. That's the length of the cable itself as it winds through walls and ceilings, not the straight-line distance, so a camera that looks close can still eat up a lot of cable going up, over, and around.

Within that limit, PoE is rock-solid. Push past it and you start to get a weak or flickering connection, or a camera that won't power up at all. The good news is the limit is generous — it covers most small-business buildings comfortably — and when you do need to go farther, there's a simple fix.

! Measure the cable path, not the map

The 328-foot limit is how far the **cable** travels, not how far apart the camera and closet look on a floor plan. A run that climbs a wall, crosses a ceiling, and drops down again adds up fast. Measure the real path.

What to do when a camera is too far

Sometimes the camera you want is beyond that 100-meter reach — the far corner of a lot, a back barn, a distant gate. Here's how the pros bridge it.

The common fix is to put a small switch or an extender partway along the run. Think of it as a relay station: the cable comes in from the closet, the device refreshes the power and signal, and a fresh run continues on from there. Each leg stays within the limit, so the far camera gets a strong, steady connection.

That midway device needs its own power and a dry, protected spot — a weatherproof box outdoors, say. For long outdoor hauls or runs between buildings there are other approaches too, and that's exactly the kind of thing worth planning with someone before the trenching or drilling starts.

★ Long runs are worth a plan first

A camera at the edge of the property is very doable, but the how depends on your buildings and distances. I'm glad to walk it with you and coordinate the licensed pro for any outdoor or between-building wiring. Call (330) 200-8042.

Why wired beats Wi-Fi for a building of cameras

Wireless cameras are tempting — no cable to run — but for a business full of cameras, wired PoE is almost always the steadier horse.

A Wi-Fi camera still needs power from a nearby outlet, so it doesn't really save you the wiring — it just trades the data cable for a power cord. And a dozen cameras all fighting for the same Wi-Fi can bog down your network and drop out at the worst moment, when a lot is happening at once and every camera is trying to send at the same time.

Wired PoE gives each camera its own dedicated line for power and video. Nothing competes, nothing drops because the microwave came on or the shop filled with phones. For a spot or two where running cable is truly impossible, Wi-Fi has its place — but as the backbone of a business system, wired wins.

✓ Wi-Fi for the exception, wired for the rule

Lean on wired PoE for the cameras that matter, and save Wi-Fi for the odd spot where a cable genuinely can't go. A mostly-wired system with one or two wireless exceptions is a sound, common setup.

Two kinds of businesses, two sets of needs

How PoE shakes out depends on your building — a compact storefront and a sprawling warehouse ask different things of the cable and the switch.

If you run a customer-facing shop or storefront

Your cameras are probably close together in a smaller footprint, so cable runs stay well within the limit and a modest switch covers you. The power budget is your main thing to watch.

- Short runs mean the 100-meter limit rarely bites you.
- A single well-chosen PoE switch usually powers the whole shop.
- Still size the power budget — heaters and night-lights add up.
- Leave a few spare ports for the camera you'll want next.

If you run an office, warehouse, or back-of-house

Big distances are your challenge: a camera at the far dock or back fence can blow past the cable limit, and many cameras can strain a switch's power budget. Planning the runs matters more here.

- Measure the real cable path to far cameras — long buildings add up fast.
- Plan a midway switch or extender for anything past the limit.
- Add up power across many cameras; you may need a bigger switch budget.
- Protect outdoor midway gear in a weatherproof, powered spot.

★ Big building or small, I'll help you map it

Tell me how your place is laid out and where you want cameras, and I'll help you plan the runs, the switch, and the power so nothing drops out or runs short. Call (330) 200-8042.

A quick word on the cable itself

The humble network cable does the heavy lifting, so a little care in choosing and running it pays off for years.

Use good-quality network cable rated for the job, and for any run that goes outdoors or through an unheated space, use cable made to handle weather and sun. Cable that bakes in the sun or soaks up moisture gets brittle and flaky, and a flaky cable means a flaky camera — the kind of intermittent fault that's maddening to chase down later.

How the cable is run matters too. Kinked, crushed, or stapled-too-tight cable can quietly hurt the signal. Running it well away from heavy electrical lines and giving it gentle curves rather than sharp bends keeps it healthy. This is a big reason the actual pulling is worth a pro's hands.

! A bad cable hides in plain sight

The trickiest camera problems often trace back to one poorly run or weather-worn cable, not the camera at all. Good cable, run with care and protected from the elements, saves you from chasing ghosts down the road.

Not all PoE pushes the same power

You'll see PoE described in a few different levels. You don't need to memorize them — you just need the switch and camera to agree.

Over the years PoE has come in versions that deliver more power, to feed hungrier cameras like the ones with heaters or motors. The names and labels can get alphabet-soupy, but the practical point is simple: a camera that needs more power needs a switch and a port that can supply it. A switch built only for light-duty PoE won't properly run a power-hungry camera.

So when you match a camera to a switch, check that the switch supplies at least the level of power the camera asks for. A reputable installer or a careful read of both spec sheets settles it. When in doubt, more capable is the safer side to err on.

✓ Match the hungry cameras carefully

Most trouble here comes from a demanding camera on an underpowered switch. Flag your heaters, your pan-and-tilt cameras, and your brightest night cameras, and make sure the switch can feed them. The rest usually look after themselves.

Cameras on their own slice of the network

Your PoE switch doesn't just power the cameras — it connects them to a network. A little care there keeps the cameras from becoming a weak spot.

Cameras are happiest on their own slice of the network, kept apart from the computers that run your business, your point-of-sale, and your files. A PoE switch for the cameras makes this natural: the cameras live on their own gear, and a camera with weak security can't become a doorway to the rest of your business.

This is its own good-sized topic, so I won't cram it all in here — our network-separation guide walks through keeping cameras on their own lane the right way. For now, just know that the switch you're buying is also a piece of your security, not only your wiring.

✓ The switch is a security choice too

When you plan the PoE switch, you're also deciding how the cameras sit on your network. Keeping them separate from your business computers is one of the simplest, cheapest safety wins — see the network-separation guide.

Keeping the cameras up when the power blinks

Here's where PoE quietly shines: because the switch powers every camera, protecting the switch protects them all at once.

A short power outage — a storm, a tripped breaker — would otherwise blind every camera and stop your recorder cold. But put a small backup battery (a UPS) under the switch, the recorder, and your network box, and the whole system rides through the blink. No gap in the footage at the very moment things tend to go wrong.

It's one of the best bargains in the whole system. One battery covers all your cameras, because they all draw their power through that one switch. Size the battery to how long you'd want to stay recording, and you've turned a vulnerable moment into a non-event.

★ A small battery, a big payoff

If you do one thing beyond the cameras themselves, put the switch and recorder on a backup battery. I'm glad to help you size one that keeps you recording through the outages your area actually sees. Call (330) 200-8042.

Planning the cable runs before anyone drills

The best time to make PoE easy is before a single hole is drilled. A little planning now saves a lot of patching later.

For each camera spot, picture the cable's whole journey back to the closet: up the wall, across the ceiling, down to the switch. Favor spots where that path is short and open — an attic or a drop ceiling is a gift. A perfect camera position that needs a long, hard pull through a finished wall can cost more in labor than the camera itself.

While the walls or ceilings are open, have a spare cable or two pulled to the next likely camera spot and left coiled. Empty cable is cheap; opening a finished wall again is not. This dovetails with our planning guide, which helps you choose camera spots in the first place.

✓ Pull one more cable than you need

Any time a wall or ceiling is open, run an extra line to where you might want a camera later and leave it coiled. The day you want that camera, it's a ten-minute job instead of a construction project.

Who should actually run the cable?

Being honest about who installs this shapes the whole plan. Some of it is a handy owner's job; some of it really isn't.

Plugging cameras into a switch, setting up the switch, getting your phone to show the cameras — that's well within reach, and it's exactly the kind of thing I'm glad to do with you. Pulling cable through finished walls, up into soffits, across a warehouse ceiling, or outdoors between buildings is heavier work that's usually best left to a pro who does it daily.

There's no shame in either path. The mistake is buying a big wired system and then living with cables stapled along the baseboards because the pull turned out to be more than a weekend allowed. We weigh the DIY, handyman, and professional routes in their own guide.

★ I do the brains and line up the brawn

I'm a tech helper, not a licensed low-voltage contractor. I'll plan the runs, choose the switch, and set the system up — and for the in-wall and outdoor cable pulls I'll bring in a trustworthy local pro and make sure it all works together. Call (330) 200-8042.

When a camera won't come on or keeps dropping

Most PoE gremlins trace back to a short list of causes. Run through these before you suspect the camera itself.

- ❑ Camera won't power up, but the switch has free ports? Suspect the power budget is maxed out.
- ❑ A far camera flickers or drops? The cable run may be past the ~100-meter limit, or the cable is damaged.
- ❑ An outdoor camera gets flaky after a season? Suspect weather-worn cable or moisture in a connection.
- ❑ A hungry camera (heater, motor) misbehaves? The switch may not supply its level of PoE power.
- ❑ Everything drops at once? Check the switch's own power and the backup battery.

! Change one thing at a time

When you're chasing a flaky camera, change a single thing and re-test before moving on — a different port, a known-good cable, a different spot on the power budget. Changing three things at once just hides which one was the culprit.

Common mistakes people make

A handful of avoidable slip-ups cause most PoE grief. Now you'll know them in advance.

- **Buying a switch by port count alone** and running out of power budget with ports to spare.
- **No headroom**, so the next camera — or a cold night with every heater on — tips the switch over.
- **Measuring the map, not the cable**, and blowing past the 100-meter limit on a far camera.
- **Cheap or wrong cable outdoors**, which goes brittle and flaky after a season in the sun.
- **Filling a building with Wi-Fi cameras** that fight for the network and drop out when it's busy.
- **No backup battery**, so a brief outage blinds every camera at once.

! The most common one by far

Running out of power budget on a switch that still has empty ports. Add up your cameras' power draw, buy a switch that comfortably exceeds it, and this whole headache never visits you.

Questions to ask before you buy

Whether you're talking to a vendor, an installer, or to me, these questions get you a switch and wiring that just work.

Q: What's this switch's total power budget, not just its port count?

You want a real number you can compare to the sum of your cameras' draw, with comfortable room left over. A vendor who only talks ports is skipping the spec that matters most.

Q: Will any of my cameras need a higher level of PoE power?

Flag the heaters, the pan-and-tilt cameras, and the bright night cameras. Make sure the switch supplies the level those hungry cameras ask for, not just light-duty PoE.

Q: How long is each cable run, measured along its real path?

Any run near the 100-meter mark needs a plan — a shorter route or a midway device. Measuring on a floor plan instead of along the cable is how far cameras end up flaky.

Q: Is the outdoor cable rated for weather and sun?

Outdoor and unheated runs need cable made for it, or they go brittle and flaky within a season or two. This is cheap insurance against a maddening fault later.

✓ There's no silly question here

PoE has a few technical corners, and a good vendor will happily walk you through them. If a seller gets impatient with these questions, that tells you something about the support you'd get down the road.

Common Questions

The questions I hear most from owners wiring up PoE cameras, answered plainly.

Q: What does PoE actually do?

It sends both power and video over one network cable, so each camera needs just that single run back to a switch — no separate power outlet at the camera. It's why professional camera installs almost always use it.

Q: How do I know what size switch to buy?

Count your cameras for the ports, then add up each camera maker's stated power draw and pick a switch whose total power budget comfortably exceeds that sum. Leave headroom for growth and cold winter nights.

Q: How far can I run the cable?

About 100 meters — roughly 328 feet — for a single run carrying power and data, measured along the cable's real path. Past that, add a switch or extender partway and continue with a fresh run.

Q: Why not just use Wi-Fi cameras everywhere?

A Wi-Fi camera still needs a power outlet nearby, and a building full of them can bog down the network and drop out when it's busy. Wired PoE gives each camera its own steady line. Save Wi-Fi for the odd spot a cable can't reach.

Q: Can one camera draw too much and cause trouble?

Yes — a hungry camera on an underpowered switch, or too many cameras for the switch's total budget, can leave a camera unable to power up. Size the power budget with headroom and match hungry cameras to a switch that can feed them.

★ Still have a wiring question?

PoE is one of my favorite things to help with, because getting the switch and runs right once means years of trouble-free cameras. Call or text me at (330) 200-8042 and we'll sort it out.

Putting it all together

That's PoE, start to finish. Here's the whole thing boiled down to a few plain sentences you can act on.

One cable carries power and video to each camera, back to a **PoE switch**. Buy that switch with enough **ports** for your cameras plus a few, and — the part people miss — enough **total power budget** to feed them all with room to spare. Add up the makers' power figures and leave headroom for growth and cold nights.

Keep each cable run within about 100 meters along its real path, and add a midway switch or extender for anything farther. Favor wired PoE over Wi-Fi for a building full of cameras, use weather-rated cable outdoors, and put the switch on a small backup battery so a blink doesn't blind you. Get those right and your cameras just work.

★ Let's wire it right the first time

Tell me your cameras and your building, and I'll help you plan the runs, size the switch and its power, and line up a pro for the cable pulls. First visit is a flat \$99, or \$49 for help on your screen. Call (330) 200-8042.

You don't have to do this alone

You just have to remember that a friendly, patient person is one call away.

I hope this guide made wiring up Power over Ethernet cameras feel a little less daunting and a lot more doable. Keep it with your other business papers, come back to a page whenever you need it, and don't worry about memorizing anything — that's what the guide is for.

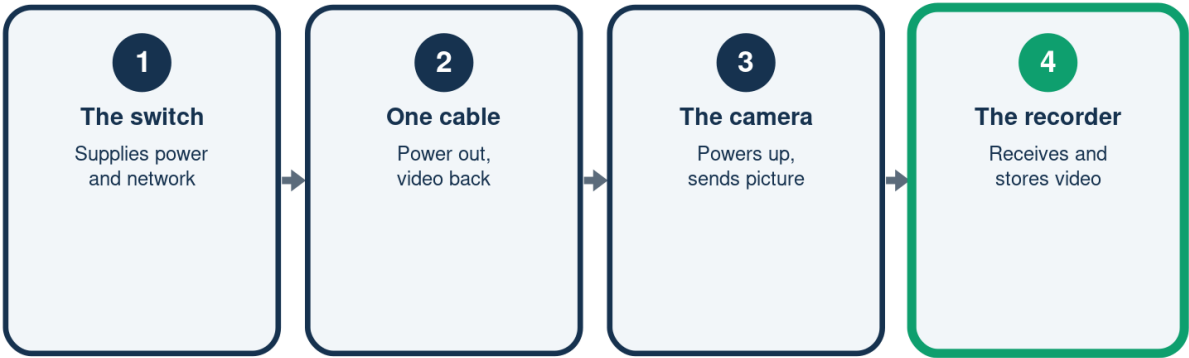
When you'd rather have a hand, that's exactly what I do. I come to your place of business, work at your pace, and never make you feel rushed or silly for asking. A first visit is a flat \$99, and for the parts that don't need me on-site I can often help right on your screen for \$49. Every visit comes with a 30-day, come-back-free guarantee. I'm a tech helper, not a licensed electrician or low-voltage contractor — for in-wall wiring or panel work I'll help you line up a trustworthy local pro and make sure it all works together.

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How One Cable Powers a Camera

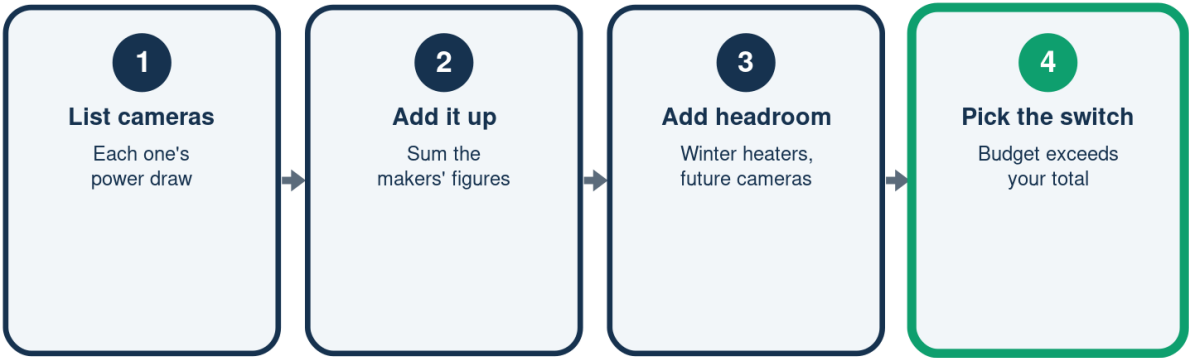
Power and video travel the same run, both ways



No power outlet at the camera -- one tidy run does both jobs.

Sizing the Switch in Four Steps

Add up the power, then buy with room to spare



A switch can have free ports and still be full on power.

The Cable Run Limit

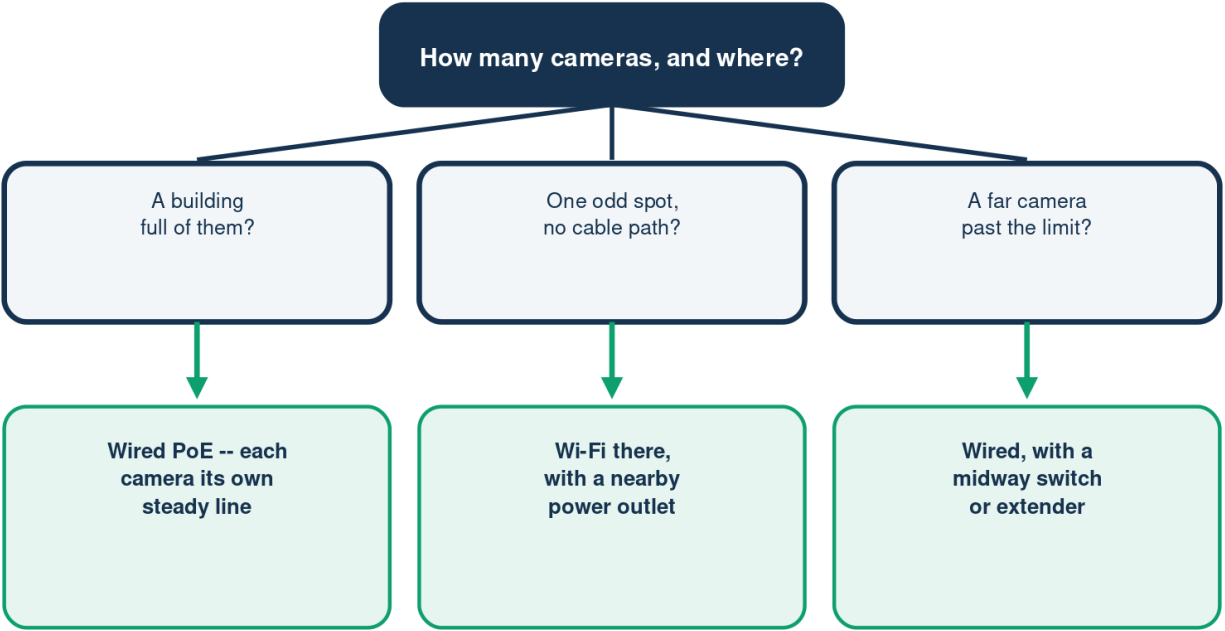
About 100 meters (328 feet) per single run

	Within the limit	Past the limit
Connection	Rock-solid	Weak / flaky
Camera power	Full power	May not start
The fix	Nothing needed	Midway switch
Measure by	Cable path	Cable path

Measure the cable's real path, not the map distance.

Wired PoE or Wi-Fi?

For a building full of cameras, wired usually wins



A Wi-Fi camera still needs a power outlet -- it doesn't skip wiring.

Illustration - a schematic, not to scale. Your setup may differ.



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A Note From Bill

A quick note from Bill.

I write these guides to make home tech a little less frustrating, and I do my best to keep every step accurate and up to date. Still, every home, device, and setup is a bit different, so I can't promise a guide will match yours exactly or fix your particular problem. These guides are for general information only — they're not professional, legal, or financial advice, and they don't replace your device's own manual or the manufacturer's instructions. Please go slow, use your own good judgment, and use everything here at your own risk. If a step involves electrical wiring, a gas appliance, a water heater, plumbing, or climbing a ladder — or if anything just doesn't feel safe — please stop and call a licensed professional (or give me a call at 330-200-8042). Bill's Home Tech and Bill Davis can't be responsible for any damage, data loss, or injury that comes from using these guides. Thanks for reading, and stay safe out there.

— *Bill*



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