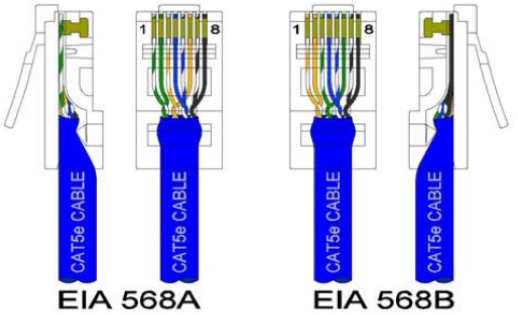
Surveillance System Camera Cabling

DETECT Business Surveillance Systems are engineered to ensure long-term reliable operation. The Leverage team can install cabling for your project, but we also recognize that cable installation can be much more affordable if done by our clients. In the interest of saving you money, we put together this guideline for anyone interested in DIY cabling. We will still get you started — during our site survey, we'll help determine what you need, and provide the information you need to ensure a successful installation.

Cabling may seem trivial—after all, it's something many of us do with our home network systems regularly. Generally, a home surveillance deployment includes pre-terminated cables, and that is our recommendation for Business Surveillance Systems as well. In this document, we outline a few reasons why. First and foremost, we've installed municipal surveillance system for over a decade, and year-in and year-out the most common installation problem is improperly terminated category 5e cables or the other factors listed in this guideline.

When self-terminating cat 5e cables, there are two possible faults, and the second one is more pernicious. The first fault is not connecting the cabling properly, and is usually found quickly. The second fault is a properly terminated cable that doesn't work at high speed (due to improper crimping). This fault can only be found with expensive test equipment. Luckily, most pre-terminated cables are tested to avoid this potential pitfall.



EIA 568A		
Pin #	Wire Color Legend	Signal
1	White/Green	TX+
2	Green	TX-
3	White/Orange	RX+
4	Blue	TRD2+
5	White/Blue	TRD2-
6	Orange	RX-
7	White/Brown	TRD3+
8	Brown	TRD3-

EIA 568B		
Pin #	Wire Color Legend	Signal
1	White/Orange	TX+
2	Orange	TX-
3	White/Greege	RX+
4	Blue	TRD2+
5	White/Blue	TRD2-
6	Green	RX-
7	White/Brown	TRD3+
8	Brown	TRD3-

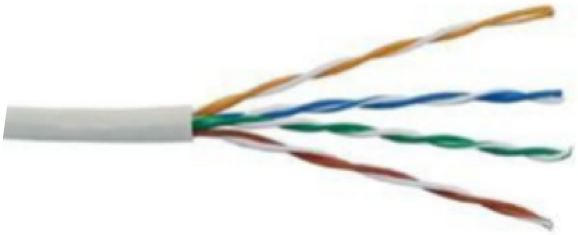
The use of tested, pre-terminated category 5e cables requires that the cable distance be determined prior to installation. That may sound simple — and in truth it can be— *if* certain guidelines are followed. Keep reading to learn more.

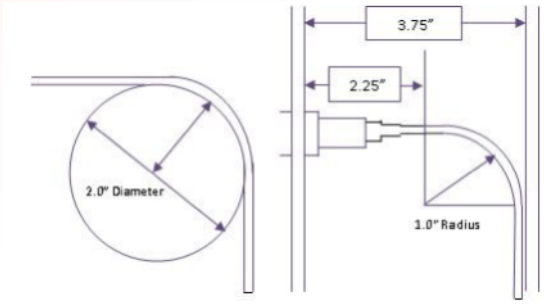
Business Surveillance System cameras receive their power and network connectivity from a single category 5e cable. The maximum distance for a direct connection from the PoE network switch to the camera is 328 feet (100 meters). Now, it may seem easier to just order all cables the maximum length and trim to fit, but there is a good reason not to do so.

Using the right equipment is half the battle of making a reliable connection between a network switch and surveillance camera. Many IT professionals would agree that there is a high degree of difficulty of delivering surveillance video over an IP network—it takes a lot to move a large amount of video information over a digital network in real-time!

The remainder of this document focuses on the external forces that may impact the performance and reliability of an IP Surveillance System. Let's first take a look inside a category 5e cable.

A category 5e cable consists of 4 twisted pairs of wire.
The number of twists per inch and distance from other wires is critical to proper operation. The signals passing through these wires can be influenced by their environment.





Bend Radius requirements
Avoid the following actions that can stress the cable:
– Applying extra twists.
– Pulling or stretching beyond the specified pulling load rate.
– Bending it beyond the specified bend radius, and not beyond 90°.

Stapling or applying pressure
Changing the dynamics of the cable by applying pressure will impact performance. Avoid the use of stapling or use of cable ties.

Avoid routing cable near EMI generation devices
A/C powered motors generate Electro-Magnetic energy that will impact the surrounding area and that is why the routing of a category 5e cable should not come within 12" of another electromagnetic field (caused by a device that creates this field).

Impact to air ventilation systems.
Ensure that the cables are not installed in front of the air ventilation grids as it leads to improper ventilation, overheating of the equipment, and dust accumulation.

Avoid exposing cable to areas of condensation and direct sunlight.

Avoid mounting cables in places that block accessibility to other equipment.

Labeling of cables is recommended.

Equipment Installation Guidelines
Thoroughly read and understand the installation guidelines for your specific equipment. Improper installation can severely impact system reliability and lifespan.

If these guideline helps you to feel confident installing your own cabling, great!
If you decide that professional installation is a better idea, we would be happy to do it.
Contact Leverage Detect anytime for a quote on your custom Business Surveillance Solution.