

Cascadia™

Creating Remote Possibilities®

The following charts show the approximate distance/wire gauge recommendations based upon voltage/amperage requirements. You need to determine the total amperage required by the equipment you are using before determining wire size.

12 VDC

Amps	20 AWG	18 AWG	16 AWG	14 AWG	12 AWG	10 AWG
.250	300	450	750	1200	2000	3000
.500	150	225	375	600	1000	1500
.750	100	150	250	375	600	1000
1.00	75	100	200	300	500	800
1.25	60	90	150	240	380	600
1.50	50	80	125	200	300	500
1.75	40	70	100	170	275	460
2.00	35	60	90	150	240	400
2.25		50	80	130	200	350
2.50			75	120	190	300
2.75			70	100	170	280
3.00			60	100	160	260

24 VAC

Amps	20 AWG	18 AWG	16 AWG	14 AWG	12 AWG	10 AWG
.250	600	900	1500	2400	4000	6000
.500	300	450	750	1200	2000	3000
.750	200	300	500	750	1200	2000
1.00	150	200	400	600	1000	1600
1.25	120	180	300	480	760	1200
1.50	100	160	250	400	600	1000
1.75	80	140	200	340	550	920
2.00	70	120	180	300	480	800
2.25		100	160	260	400	700
2.50			150	240	380	600
2.75			140	200	340	560
3.00			120	200	320	520

Wiring and Voltage Loss

Wiring is usually the most disregarded subject associated with CCTV cameras. Most people use a wire gauge that they are familiar with, usually 18 gauge. Use the following formula for figuring out the voltage drop in a given current. You take the resistance per 1000 feet of wire and multiply it by the current. This equals the voltage loss.

Wire Gauge Resistance in Ohms @ 77° F

12 Gauge	1.62
14 Gauge	2.58
16 Gauge	4.09
18 Gauge	6.51
20 Gauge	10.4
22 Gauge	16.5

(Figures from the Circ. 31, U.S. Bureau of Stds)

Formula:

Ohms x (Wire length/1000) x Current = Voltage Drop.

Example:

1500 feet of 18 gauge wire with a camera that is drawing .3A.

Equation:

$6.51 \times (1500/1000) \times .3 \text{ Amps} = 2.91 \text{ Volts}$

Conclusion:

If you have a camera that takes .3 Amps at 24 Volts AC, by the time you send the power out you only have 21.09 Volts at the camera. This would normally fall within the tolerances of the camera and not be a problem. But, if you had a 12 Volt DC camera at the same current and wire length, you would only have 9.09 volts at the camera which would not fall with the nominal 10%~15% variance of the camera. In this example you would only have 75% of the rated voltage needed to power the camera. This will cause marginal performance and shorten the life of the camera.