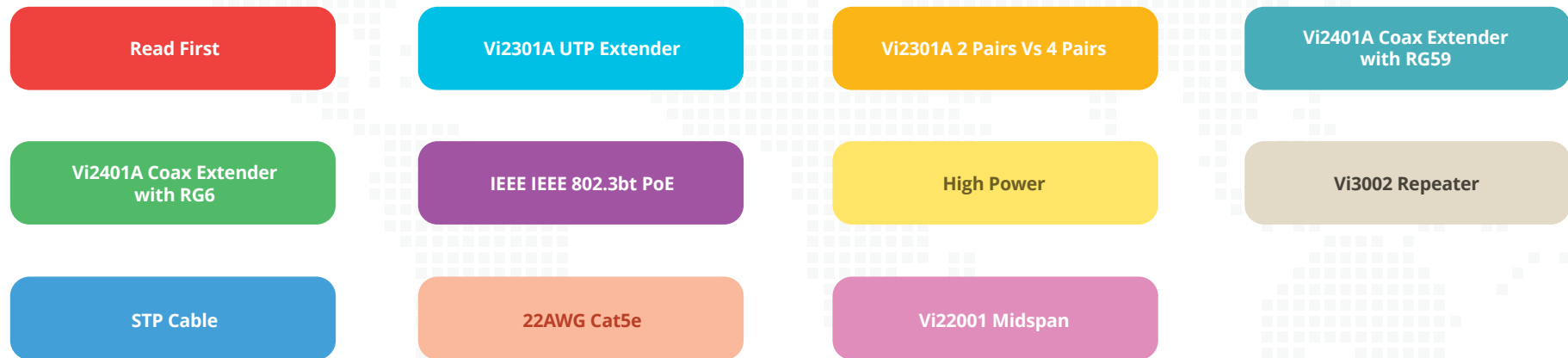




# COMPLETE NETWORK SOLUTIONS FOR SECURITY APPLICATIONS



A network comprises various components, each with its own set of considerations. The information presented in this document is a result of testing conducted by Vigitron engineers, who used Vigitron products as well as several commonly available products powered by PoE. When implementing these findings, it is crucial to acknowledge the variations that arise from the use of different PoE components. **It should be noted that PoE+, PoE++, and UPoE are not IEEE standards and, due to disparities in product design, can yield different outcomes.**

In presenting this document, **Vigitron makes no claims regarding the application or warranty of this document, other than those that apply to its individual products.** Users are responsible for utilizing this information in its entirety and considering their network design and connected products. Vigitron does not assume responsibility for products, other than Vigitron's own, that are connected to the network and their operation. The warranty provided by Vigitron is limited to the specified operation. Vigitron cannot be held responsible for equipment operating under conditions not specified or mistakenly ordered, and such equipment is not covered by the warranty.

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## Operational and Test Conditions

### Wire

Wiring must be as stated and limited to UTP: Cat 5e, Cat 6, Cat 6a. Coax: RG59, Single pair: Will have different performance depending on wire AWG and type. Contact Vigitron to discuss single wire applications. Wiring must be continuous with no cuts, jumpers or connections placed in other than cable ends.

### PoE sources and connected devices

PoE sources must be as indicated. Readers should be aware of potential product surges for accessory functions such as Day/Night, Auto back focus, LED turn on. It is suggested that regardless of the specific source and connected device PoE volume Power provides should be based on PoE class and in many cases an increase of at least 20% should be taken into account to handle connected device PoE surges.

### PoE Compatibility

PoE approved under IEEE standards includes 8 different classes ranging from 1 to 90W. These are known as IEEE IEEE 802.3af, IEEE IEEE 802.3at, and IEEE IEEE 802.3bt. Each operates differently having different source requirements. This includes differences with non standard PoE such as PoE+, PoE++ and UPoE. Regardless of providing the amount of PoE required by a connected device if the PoE source is not compatible with connected device the result will be non operation.

# Vi2301A UTP Extender

<b>Configuration</b>	Midspan ● — ● <b>Vi2301A</b> ● — Long Cat5e — ● <b>Vi2301A</b> ● — Camera
<b>Transceivers</b>	<b>Vi2301A ( x 2 )</b>
<b>Cable Distance (feet)</b>	<b>Power available at PD</b>

<b>3000 feet</b>	Class 2 (6.49 W) @10Mbps	Class 2 (6.49 W) @10Mbps	Class 0 or 3 (12.95 W) @10Mbps
<b>2500 feet</b>			
<b>2000 feet</b>		Class 2 (6.49 W) @100Mbps	
<b>1800 feet</b>			
<b>1500 feet</b>	Class 2 (6.49 W) @100Mbps		Class 0 or 3 (12.95 W) @100Mbps
<b>1300 feet</b>			
<b>1000 feet</b>		Class 0 or 3 (12.95 W) @100Mbps	
<b>800 feet</b>			
<b>500 feet</b>			Class 4 (25 W) @ 100Mbps
<b>300 feet or less</b>			
<b>PoE PSE source</b>	15.4 W	30 W	37 W

**Note:**

1. IEEE IEEE 802.3af require minimum 37 V at PD
2. IEEE IEEE 802.3at require minimum 42.5 V at PD
3. The standard Cat5e has 52 Ohm loop DC resistance per 1000 feet.



## Vi2301A UTP Extender

<b>Configuration</b>	Midspan ● — ● <b>Vi2301A</b> ● — Long Cat5e — ● <b>Vi2301A</b> ● — Camera							
<b>Transceivers</b>	<b>Vi2301A ( x 2 )</b>							
<b>Cable Distance (feet)</b>	<b>Power available at PD</b>							
<b>3000 feet</b>		Class 2 (6.49 W) @10Mbps		Class 2 (6.49 W) @10Mbps		Class 2 (6.49 W) @10Mbps		
<b>2400 feet</b>	Class 1 (4 W) @10Mbps	Class 2 (6.49 W) @10Mbps	Class 1 (4 W) @10Mbps	Class 1 (4 W) @10Mbps	Class 1 (4 W) @10Mbps	Class 2 (6.49 W) @10Mbps		
<b>2250 feet</b>				Class 0 or 3 (12.95 W) @10Mbps		Class 0 or 3 (12.95 W) @10Mbps		
<b>2000 feet</b>	Class 1 (4 W) @100Mbps	Class 2 (6.49 W) @100Mbps	Class 1 (4 W) @100Mbps	Class 0 or 3 (12.95 W) @100Mbps	Class 1 (4 W) @100Mbps	Class 0 or 3 (12.95 W) @100Mbps		
<b>1800 feet</b>								
<b>1500 feet</b>					Class 2 (6.49 W) @100Mbps			Class 2 (6.49 W) @100Mbps
<b>1300 feet</b>								Class 0 or 3 (12.95 W) @100Mbps
<b>1100 feet</b>	Class 2 (6.49 W) @100Mbps						Class 0 or 3 (12.95 W) @100Mbps	
<b>800 feet</b>			Class 0 or 3 (12.95 W) @100Mbps		Class 0 or 3 (12.95 W) @100Mbps	Class 4 (25 W) @ 100Mbps		
<b>400 feet</b>				Class 4 (25 W) @ 100Mbps				
<b>300 feet or less</b>								
<b>Number of Pairs</b>	2 pairs	4 pairs	2 pairs	4 pairs	2 pairs	4 pairs		
<b>PoE PSE source</b>	15.4 W		30 W		37 W			

**Note:**

1. IEEE 802.3af require 37 V at PD
2. IEEE 802.3at require 42.5 V at PD
3. The standard Cat5e has 52 ohm loop DC resistance per 1000 feet.

## Vi2401A Coax Extender

<b>Configuration</b>	Midspan ● — ● <b>Vi2401A</b> ● — Coax RG59 — ● <b>Vi2401A</b> ● — ● Camera		
<b>Transceivers</b>	<b>Vi2401A ( x 2 )</b>		
<b>Cable Distance (feet)</b>	<b>Power available at PD</b>		
<b>3000 feet</b>	Class 2 (6.49 W) @10Mbps	Class 2 (6.49 W) @10Mbps	Class 0 or 3 (12.95 W) @10Mbps
<b>2500 feet</b>			
<b>2000 feet</b>	Class 2 (6.49 W) @10Mbps	Class 2 (6.49 W) @10Mbps	Class 0 or 3 (12.95 W) @10Mbps
<b>1800 feet</b>			
<b>1500 feet</b>	Class 2 (6.49 W) @100Mbps	Class 0 or 3 (12.95 W) @100Mbps	Class 0 or 3 (12.95 W) @100Mbps
<b>1300 feet</b>			
<b>1000 feet</b>			Class 4 (25 W) @ 100Mbps
<b>800 feet</b>			
<b>500 feet</b>	Class 4 (25 W) @ 100Mbps		
<b>300 feet or less</b>			
<b>PoE PSE source</b>	15.4 W	30 W	37 W

### Note:

1. IEEE 802.3af require 37 V at PD
2. IEEE 802.3at require 42.5 V at PD
3. The standard RG59 20AWG cable has round trip 22 ohm loop DC resistance per 1000 feet.

## Vi2401A Coax Extender

<b>Configuration</b>	Midspan ● — ● <b>Vi2401A</b> ● — Coax RG6 — ● <b>Vi2401A</b> ● — ● Camera		
<b>Transceivers</b>	<b>Vi2401A (2pcs)</b>		
<b>Cable Distance (feet)</b>	<b>Power available at PD</b>		
<b>3000 feet</b>	Class 2 (6.49 W) @10Mbps	Class 2 (6.49 W) @10Mbps	Class 0 or 3 (12.95 W) @10Mbps
<b>2500 feet</b>			
<b>2000 feet</b>	Class 2 (6.49 W) @10Mbps	Class 0 or 3 (12.95 W) @10Mbps	Class 0 or 3 (12.95 W) @10Mbps
<b>1800 feet</b>			
<b>1500 feet</b>			
<b>1300 feet</b>	Class 2 (6.49 W) @100Mbps	Class 0 or 3 (12.95 W) @100Mbps	Class 0 or 3 (12.95 W) @100Mbps
<b>1000 feet</b>			
<b>700 feet</b>			
<b>500 feet</b>			Class 4 (25 W) @ 100Mbps
<b>300 feet or less</b>			
<b>PoE PSE source</b>	15.4 W	30 W	37 W

### Note:

1. IEEE 802.3af require 37 volts at PD
2. IEEE 802.3at require 42.5 volts at PD
3. The RG6 18AWG cable that is used for testing has 16.5 ohm loop DC resistance per 1000 feet.

Vi22001U • Vi2301AU • Cat6 (23AWG) • Vi2301AU • (bt PD) Camera

bt PD class	Cat6 (23AWG) distance (feet)	Connected Device PoE Type
Class 0, 1, 2 and 3 (12.95W)	3000	IEEE 802.3af
Class 4 (25.5W)	1500	IEEE 802.3at
Class 5 (40W)	1000	IEEE 802.3bt
Class 6 (51W)	800	IEEE 802.3bt
Class 7 (60W)	680	IEEE 802.3bt
Class 8 (71W)	380	IEEE 802.3bt

Source 90W IEEE 802.3bt

## Vigatron Distance Chart

### Cat5E (24AWG)

Transceiver	Vi2301A (2 pcs)	Vi2301A (2pcs)	Vi2301A (2pcs)	Vi2301A	Vi2701TX	Vi2701TX	Vi2301A (2pcs)	Vi2301AU (2pcs)
Distance feet/meters	Power @ PD	Power @ PD	Power @ PD	Power @ PD	Power @ PD	Power @ PD	Power @ PD	Power @ PD
3000ft					12.95 W Class 3 @10M bps	12.95 W Class 3 @10 Mbps	12.95 W Class 3 @10 Mbps	12.95 W Class 3 @10 Mbps
2000ft								
1500ft					25.5 W Class 4 @100 Mbps	25.5 W Class 4 @100 Mbps	25.5 W Class 4 @100 Mbps	25.5 W Class 4 @100 Mbps
800ft								
750ft								
600ft							50 W @100Mbps	50 W @100 Mbps
550ft	50 W @100 Mbps	50 W @100 Mbps	50 W @ 100 Mbps	50 W @ 100 Mbps	50 W @100 Mbps			
500ft							60 W @ 100 Mbps	60 W @ 100 Mbps
328ft			60 W @ 100Mbps	60 W @ 100Mbps	60 W @ 100 Mbps	60 W @ 100 Mbps		
PSE Power	Source Axis (T8124)	Source Sony (9501G)	Source Vigatron (Vi2208/16A)	Source Vigatron (Vi2508/16)	Source Vigatron (Vi2508/16)	Source Vigatron (Vi2701RX)	Source Vigatron (Vi22001)	Source Vigatron (Vi22001)

#### Note:

- The camera has been used for this setup is Axis Q6032-E with 48W maximum power.
- Axis T8124 and PowerDsine 9501G have the same rating output on the label (55V, 1.35A), but the Axis PSE provides 60 W output and PowerDsine 9501G can provide about 65W. Therefore, Axis T8124 and Sony 9501G can only achieve about 600 feet distance.
- Vi2208A/16A, Vi2508/16 and Vi2701RX can provide 74W power; therefore, if use Vigatron setup as [Vi2208A/16A -- Vi2301A -- Vi2301A -- Q6032-E], it can achieve a distance of 750 feet.

### Cat6 (23AWG)

Transceiver	Vi2301A (2 pcs)	Vi2301A (2pcs)	Vi2301A (2pcs)	Vi2301A	Vi2701TX	Vi2701TX	Vi2301A (2pcs)
Distance feet/meters	Power @ PD	Power @ PD	Power @ PD	Power @ PD	Power @ PD	Power @ PD	Power @ PD
3000ft					12.95 W Class 3 @ 10Mbps	12.95 W Class 3 @ 10Mbps	12.95 W Class 3 10Mbps
2000ft							
1500ft					25.5 W Class 4 @100Mbps	25.5 W Class 4 100Mbps	25.5 W Class 4 @100Mbps
800ft							
750ft							50 W @100Mbps
600ft			50 W @ 100Mbps	50 W @100Mbps	50 W @100Mbps	50 W @100Mbps	
550ft							
500ft	50 W @100Mbps	50 W @100Mbps					60 W @ 100Mbps
328ft			60 W @ 100Mbps	60 W @ 100Mbps	60 W @ 100Mbps	60 W @ 100Mbps	
PSE Power	Source Axis (T8124)	Source Sony (9501G)	Source Vigatron (Vi2208/16A)	Source Vigatron (Vi2508/16)	Source Vigatron (Vi2508/16)	Source Vigatron (Vi2701RX)	Source Vigatron (Vi22001)

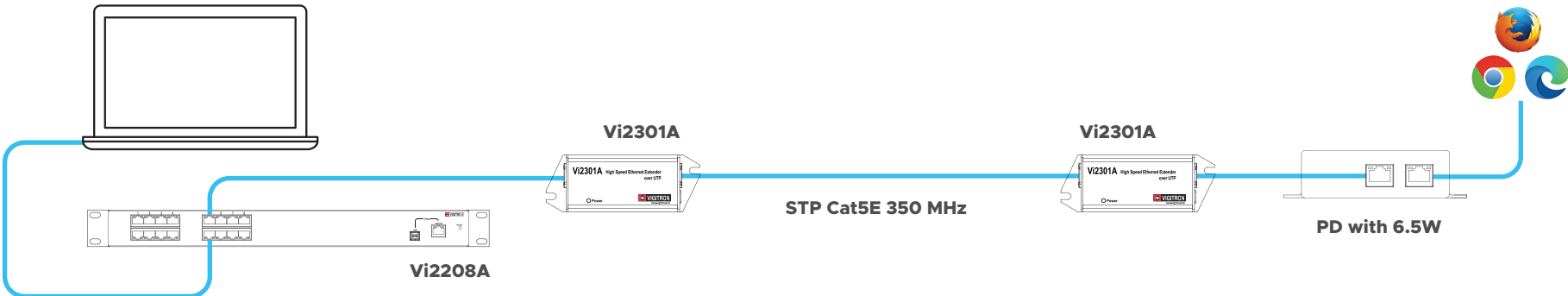


## Vigitron Distance Chart

Repeater	Vi3002	Vi3002	Vi3002	Vi3002
Distance feet/meters	Power @ PD	Power @ PD	Power @ PD	Power @ PD
3000ft				
2500ft		12.95 W Class 3 @100 Mbps (Daisy chain 7pcs of Vi3002)	6.5 W Class 2 @100 Mbps (Daisy chain 6pcs of Vi3002)	
2200ft				
1800ft		25.5 W Class 4 @100 Mbps (Daisy chain 3 pcs of Vi3002)	12.95 W Class 3 @100 Mbps (Daisy chain 4 pcs of Vi3002)	6.5 W Class 2 @100 Mbps (Daisy chain 5pcs of Vi3002)
1500ft				
1200ft				
800ft	50 W @100 Mbps (Daisy chain 2ps of Vi3002)	25.5 W Class 4 @100 Mbps (Daisy chain 3 pcs of Vi3002)	12.95 W Class 3 @100 Mbps (Daisy chain 4 pcs of Vi3002)	6.5 W Class 2 @100 Mbps (Daisy chain 5pcs of Vi3002)
750ft				
600ft				
500ft		25.5 W Class 4 @100 Mbps (Daisy chain 1 pc of Vi3002)		12.95 W Class 3 @100 Mbps (Daisy Chain 1 pc of Vi3002)
428ft	60 W @ 100 Mbps (Daisy chain 1pc of Vi3002)			
328ft				
<b>PSE Power</b>	Source Vigitron 74W (Vi2208/16A)	Source Vigitron 37W (Vi2208/16A)	Source 30W (2 pairs)	Source 15.4W (2 pairs)

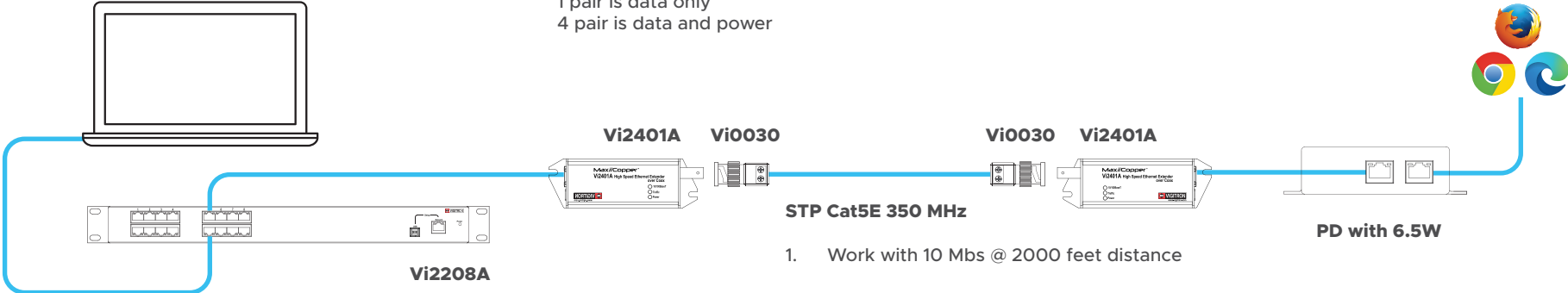
# Vigtron Distance Chart for STP cable

Product ID	Vi2301A	Vi2401A + Vi0030
Distance feet/meters	Power @ PD	Power @ PD
3000ft	6.5 W Class 2 @10 Mbps	
2500ft		
2000ft	6.5 W Class 2 @100 Mbps	6.5 W Class 2 @10 Mbps
1800ft		
1500ft		
1000ft		
750ft		
500ft		
328ft		



1. Provides 100 Mbps @ 2000 feet distance
2. Provides 10Mbps @ 3000 feet distance

**Note:**  
 1 pair is data only  
 4 pair is data and power



1. Work with 10 Mbps @ 2000 feet distance



Cable Model# PW52-H25-46 from Superior Essex

<b>Configuration</b>	Midspan ● — ● Vi2301A ● — 22AWG cat5e — ● Vi2301A ● — ● Camera				
<b>Transceivers</b>	Vi2301A				
<b>Cable Distance (feet)</b>					
<b>3000 feet</b>	Class 1, 2 (6.5W) @ 10 Mbps	Class 1, 2 (6.5W) @ 10 Mbps	Class 0, 1, 2, 3 up to 22W CAM @ 10Mbps	Class 0, 1, 2, 3 up to 22W CAM @ 10 Mbps	
<b>2500 feet</b>		Class 0, 1, 2, 3 (12.95W) @ 10 Mbps			
<b>2000 feet</b>	Class 1, 2 (6.5W) @ 100 Mbps	Class 0, 1, 2, 3 (12.95W) @ 100 Mbps	Class 0, 1, 2, 3 up to 22W CAM @ 100 Mbps	Class 0, 1, 2, 3 up to 22W CAM @ 100 Mbps	
<b>1800 feet</b>					
<b>1500 feet</b>					
<b>1400 feet</b>				Class 4 CAM (25W) @ 100 Mbps	
<b>1200 feet</b>				Class 4 CAM (25W) @ 100 Mbps	50W CAM @ 100 Mbps
<b>1000 feet</b>					60W CAM @ 100 Mbps
<b>500 feet</b>					
<b>300 feet or less</b>					
<b>PoE PSE source</b>	Vendor Midspan (15.4W)	Vendor Midspan (30W)	Vigtron Midspan, Vi22xxA (37W)	Vigtron Midspan, Vi22xxA (74W)	

Note:

1. IEEE 802.3af require 37 V at PD.
2. IEEE 802.3at require 42.5 V at PD.
3. This is 22AWG Cat5e (Model# PW52-H46-25 from Superior Essex).

<b>Configuration</b>	Midspan ● — ● Vi2301A ● — Power Wise™ CAT 5e+ 22 AWG — ● Vi2301A ● — ● Camera		
<b>Source Power Level Vigtron PoE source</b>	<b>Vigtron Model Numbers</b>	<b>PowerWise™ &amp; Vigtron Performance Cable Distance</b>	<b>PD or Camera</b>
<b>37W</b>	Vi3005 <sup>1</sup> , Vi3105 <sup>1</sup> / Vi3205 <sup>1</sup> , Vi3305 <sup>1</sup> , Vi3405 <sup>1</sup> Vi2200, Vi2208, Vi2216, Vi2216LT, Vi2508, Vi2516, Vi2608, Vi2616	3,000 Feet	
<b>37W</b>	Vi3005 <sup>1</sup> , Vi3105 <sup>1</sup> / Vi3205 <sup>1</sup> , Vi3305 <sup>1</sup> , Vi3405 <sup>1</sup> Vi2200, Vi2208, Vi2216, Vi2216LT, Vi2508, Vi2516, Vi2608, Vi2616	2,000 Feet	
<b>37W</b>	Vi3005 <sup>1</sup> , Vi3105 <sup>1</sup> / Vi3205 <sup>1</sup> , Vi3305 <sup>1</sup> , Vi3405 <sup>1</sup> Vi2200, Vi2208, Vi2216, Vi2216LT, Vi2508, Vi2516, Vi2608, Vi2616	1,500 Feet	
<b>74W</b>	Vi2701Rx / Vi3005 <sup>2</sup> / Vi3305 <sup>2</sup> / Vi3105 <sup>2</sup> Vi2208 <sup>3</sup> , Vi2216 <sup>3</sup> , Vi25084, Vi25164	1,200 Feet	
<b>74W</b>	Vi2701Rx / Vi3005 <sup>2</sup> / Vi3305 <sup>2</sup> / Vi3105 <sup>2</sup> Vi2208 <sup>3</sup> , Vi2216 <sup>3</sup> , Vi25084, Vi25164	500 Feet	

1. Requires use of Vi1120 PSE power supply.
2. Requires use of Vi0016 to combine two ports and Vi1120 PSE power supply.
3. Ports 1-4 provide up to 74 W, Ports 5-12 require Vi0016 to combine two ports.
4. Ports 1-4 provide 74 W.

<b>Configuration</b>	Midspan ● — ● Vi2301A ● — Standard CAT 5e — ● Vi2301A ● — ● Camera		
<b>Source Power Level Vendor PoE source</b>	<b>Vendor PoE Switch or Midspan</b>	<b>Industry Standard (Cat5E) &amp; Vendor Midspan Performance Cable Distance</b>	<b>PD or Camera</b>
<b>30W</b>		3,000 Feet	Class 1 or 2 Up to 6.5 W Camera @ 10Mbps
<b>30W</b>		2,000 Feet	Class 1 or 2 up to 6.5 W Camera @ 100Mbps
<b>30W</b>		1,500 Feet	Class 0, 1, 2 or 3 Up to 12.95 W Camera @ 100Mbps

## Vi22001 Midspan

	Cat5E (24AWG)	Cat6 (23AWG)
<b>Transceivers</b>	Vi2301A Mod 95W (2pcs)	Vi2301A Mod 95W (2pcs)
<b>Cable Distance (feet)</b>	<b>Power @ PD</b>	<b>Power @ PD</b>
<b>3000ft</b>	12.95W Class 3 @10Mbps	12.95W Class 3 @10Mbps
<b>2000ft</b>		25.5W Class 4 @100Mbps
<b>1600ft</b>	25.5W Class 4 @100Mbps	
<b>1500ft</b>	50W @100Mbps	
<b>825ft</b>		
<b>750ft</b>	60W @ 100Mbps	60W @ 100Mbps
<b>600ft</b>		
<b>550ft</b>	60W @ 100Mbps	60W @ 100Mbps
<b>500ft</b>		
<b>328ft</b>	60W @ 100Mbps	60W @ 100Mbps
<b>PSE Power</b>		