

# HUBBELL



## LINKOSITY™

### Wiring Solutions

Innovative



Flexible



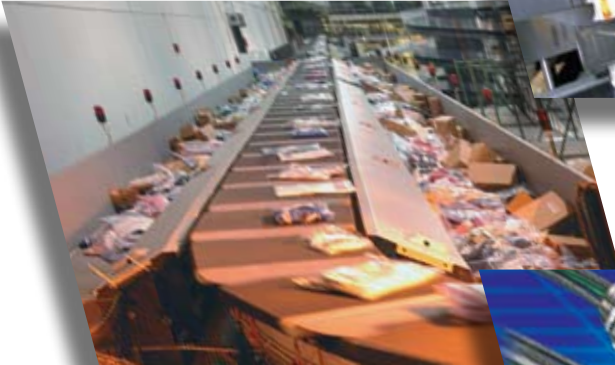
Self-Contained



Plug & Play



Dependable



Wiring Device-Kellems

[www.hubbell-wiring.com](http://www.hubbell-wiring.com)



LINKOSITY™ power system is a modular plug-and-play wiring method that enables fast installation and high technical performance for 20A and 30A circuits up to 600 VAC power distribution.

**Pre-manufactured component assemblies**

LINKOSITY™ power system consists of re-configurable, factory-defined assemblies that can be easily installed as a cost effective alternative to conventional wiring methods. Basic components of the system include code-compliant distribution components (including cables, receptacles, tees and pass-thrus), NEMA configured point of use devices and self-contained power supplies.

**Reduced Cost of Ownership**

The plug-and-play architecture and re-usability drastically reduces the total cost of ownership of electrical power systems. Alternative installations of pipe and wire are dedicated to specific applications and typically require labor-intensive components. LINKOSITY™ products take the guess-work out of job site interpretation of electrical drawings enabling faster implementation and consistently high quality error free installations.

**Code Compliant**

LINKOSITY™ power system works in conjunction with standard NEMA wiring devices allowing use of common NEMA connections for peripheral equipment or convenience power.



# The LINKOSITY™ Story



## **LINKOSITY™** Wiring Solutions

LINKOSITY™ wiring solutions is a series of patent pending technologies conceived by Lockheed Martin for use on nationally deployed systems for a postal provider. Extremely aggressive implementation time lines and technical installation simplicity drove the need for this technology on complex material handling and sorting equipment.

Lockheed Martin designed a plug-and-play methodology that enables easy assembly of modular components at the job site with minimal interpretation of the electrical wiring requirements. A high level of quality assurance is built into the method and components.

Lockheed Martin internal successes have spawned the widespread commercialization of this technology. LINKOSITY™ wiring solutions as offered by Hubbell represent the latest generation of state of the art technology defined by Lockheed Martin. Only premier industry suppliers are approved licensees.





## Cable Assemblies



For permanent installations the UL Listed LINKOSITY™ cable assemblies incorporate a tray rated cable (Type TC) that carries a UL Type “ER” rating for open wiring that has the crush and impact resistance of metal-clad (Type MC) cable. For temporary installations the same LINKOSITY™ cable assemblies also have a Type STOOW cord rating. For industrial machinery, the LINKOSITY™ cable assemblies are rated Type MTW.

This blend of critical performance characteristics makes LINKOSITY™ cable assemblies code compliant with the NEC and NFPA 79, and suitable for use in virtually any environment as either a permanent or temporary installation.

## Power System Distribution Assemblies



The UL Listed LINKOSITY™ distribution assemblies facilitate equipment connections requiring NEMA wiring devices or for convenience power. Distribution assemblies are modular and pre-wired in a variety of standard and custom configurations.

## Power System Supply Assemblies



The UL Listed LINKOSITY™ power supplies are multi-function units incorporating a transformer, a disconnect and circuit protection in one compact package that serve as a separately derived source of power between existing utility or facility power and LINKOSITY™ wiring and power system assemblies.

## Tees and Pass-thrus



The UL Listed LINKOSITY™ tees and pass-thrus are a means of quickly effecting a high quality tap from a feeder or multi-wire branch circuit.

## Receptacles



The UL Listed LINKOSITY™ male inlets or female receptacles provide the capability of interfacing directly with facility wiring by simply mounting into established fixed enclosures.

## Closure Caps



Protects unused devices from the harmful effects of harsh environments.

# LINKOSITY™ Control Integration

LINKOSITY™ control integration is a modular, flexible plug-and-play wiring and interconnect solution for industrial power, control and communication applications. Connectivity solutions range from a nominal 3A up to 300V and 10A up to 600V AC.

**Flexible**

System designers can use the connectivity components (including cables, receptacles, and tees) to configure systems of any size and scope, making installation, reconfiguration, disassembly and reuse easy.

Hand tool installation, factory assembled connections and true plug-and-play simplicity ensure installation of high quality, reliable systems in the shortest time and the lowest possible cost.

**Temporary**

Systems designed with LINKOSITY™ control integration components are suitable for use wherever NFPA, IEC and SAE standards are preferred.

**Permanent**

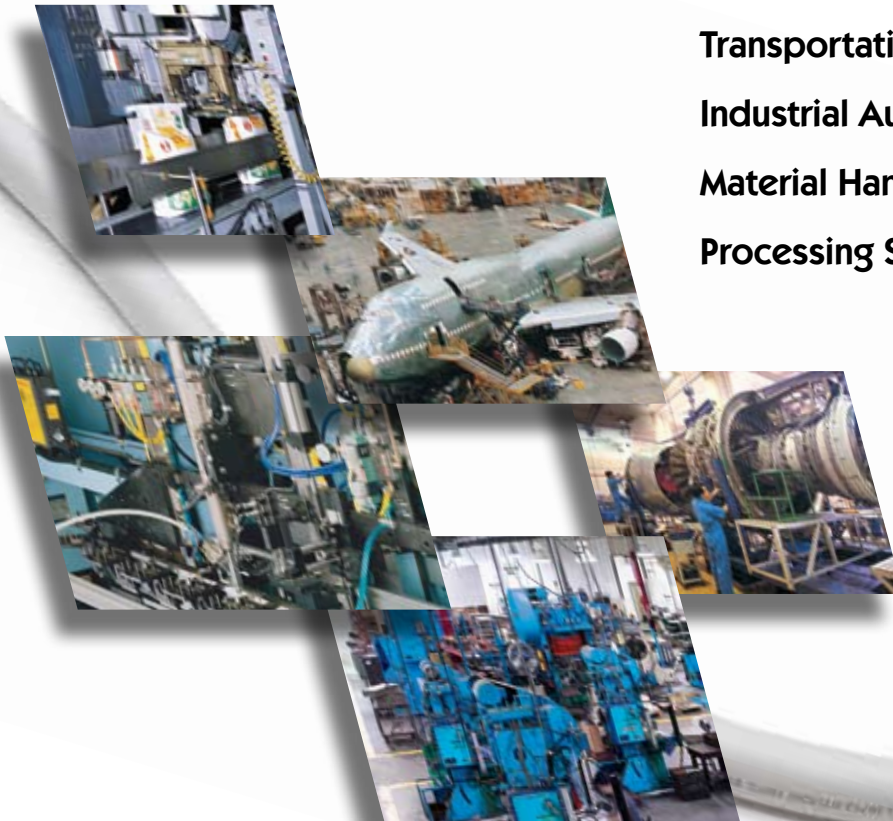
**Control Systems**

**Transportation Systems**

**Industrial Automation**

**Material Handling**

**Processing Systems**



# Specifications & User Guides



## CERTIFICATIONS

System Level	ETL Classified to NEC
Component Assemblies	
PSDA	Listed to UL5
PSSA	Listed to UL508A
Connecting Components	Listed to UL 2238 and UL 50

## PERFORMANCE

### Electrical

Voltage	Up to 600V AC
Amperage	Up to 30A

### Environmental

#### Connectivity System Components

Moisture Resistance	UL Type 4, 4X, 12 and 13
Ingress Protection	IP67 Suitability
Flammability	UL94HB Cables / UL94V-0 receptacles

#### Power System Distribution Assemblies

Moisture Resistance	NEMA Type 1, optional Type 3R
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#### Power System Supply Assemblies

Moisture Resistance	NEMA Type 3R
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## MATERIALS

### Connectivity System Components

Contact Carrier	Nylon 6/6, white
Contact Materials	Pins - brass Sockets - beryllium copper
Contact Plating	Hard gold over palladium/nickel
Overmold Material	Glass filled polyurethane, gray
Coupling Hardware	Nickel plated brass
Cable (Up to 22AWG)	UL 300V Type ITC/PLTC 105°C
Cable (16 AWG and Up)	UL 600V Type TC-ER, MTW 90°C or ST00W 600V 105°C

### Power System Distribution Assemblies

Enclosure	16 gauge CRS, powder coated
Color	ANSI 61, gray
Connecting Devices	LINKOSITY™ receptacle, inlet
Wiring Devices	5-20R, L5-15R, L5-20R
Fuse	20A; ceramic body 1-1/4"x1/4"

### Power System Supply Assemblies

Input Voltage	575/480/415 VAC, 3Ø, 50/60 Hz
Output Voltage	208/120 VAC, 3Ø
Transformer	15 kVA, shielded, K Factor 20, copper wound
Main Circuit Breaker	30A thermal magnetic type; 3 pole
Branch Circuit Breakers	20A thermal magnetic type; 3 pole
Surge Suppression	High capacity varistor
Connecting Devices	(6) LINKOSITY™ receptacles
Cooling	Convection
Max Ambient temp	40° C
Max Temp. Rise	115° C
Duty Cycle	100%
Enclosure	16 gauge CRS, NEMA 3R
Color	ANSI 61 gray powder coat

## AVAILABLE USER GUIDES



Designer's Guide



Installer's Guide



Inspector's Guide



Code Guide


To download PDF files of the above guides, visit [www.hubbell-wiring.com](http://www.hubbell-wiring.com)



Wiring Device-Kellems

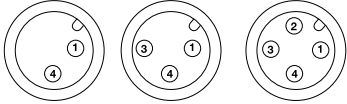
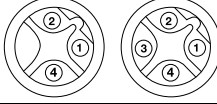
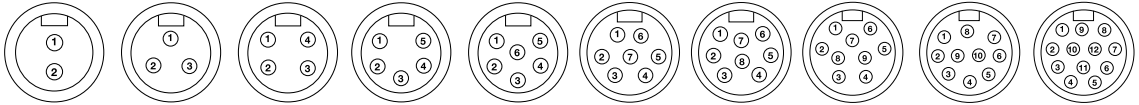


## Cables & Receptacles

Device Type	Ratings	Wires	Conductor Colors*	Length (FT)
 <b>PH</b> = Double Ended Cable	<b>03</b> = 5A - 2W, 3W 4A - 4W up to 300V  <b>R3</b> = 5A - 2W, 3W 4A - 4W up to 300V	<b>02</b> <b>03</b> <b>04</b>	<b>PA</b> = Green/Yellow Black (all others)  <b>PB</b> = Green/Yellow White Black (all others)	<b>001</b> = 1' <b>005</b> = 5' <b>010</b> = 10' <b>015</b> = 15' <b>020</b> = 20' <b>025</b> = 25' <b>030</b> = 30' <b>035</b> = 35' <b>040</b> = 40' <b>045</b> = 45' <b>050</b> = 50'

Example: PH 10 06 PB 005

## Configurations (Male Face View Shown, Female view is opposite)

<b>3</b>		Typically used for inputs in DC control circuits
<b>R3</b>		Typically used for outputs in DC control circuits
<b>10</b>		

## Splitters/Tees

Catalog Numbers	Description
<b>TX0304000304</b>	LINKOSITY™, M/F/F Splitter, 3A/4W
<b>TX1002001002T00</b>	LINKOSITY™, M/F/F Tee, 10A, 2 Pole
<b>TX1003001003T00</b>	LINKOSITY™, M/F/F Tee, 10A, 3 Pole
<b>TX1004001004T00</b>	LINKOSITY™, M/F/F Tee, 10A, 4 Pole
<b>TX1005001005T00</b>	LINKOSITY™, M/F/F Tee, 10A, 5 Pole
<b>TX1006001006T00</b>	LINKOSITY™, M/F/F Tee, 10A, 6 Pole



TX1004001004T00

## Closure Caps

Catalog Numbers For a Female Receptacle	For a Male Inlet	Description
<b>CCM1C</b>	<b>CCF1C</b>	3A Closure Cap
<b>CCMAC</b>	<b>CCFAC</b>	10A Closure Cap, 2,3,4,5 & 6 Pole
<b>CCMBC</b>	<b>CCFBC</b>	10A Closure Cap, 7 & 8 Pole
<b>CCMCC</b>	<b>CCFCC</b>	10A Closure Cap, 9, 10 & 12 Pole



CCMAC

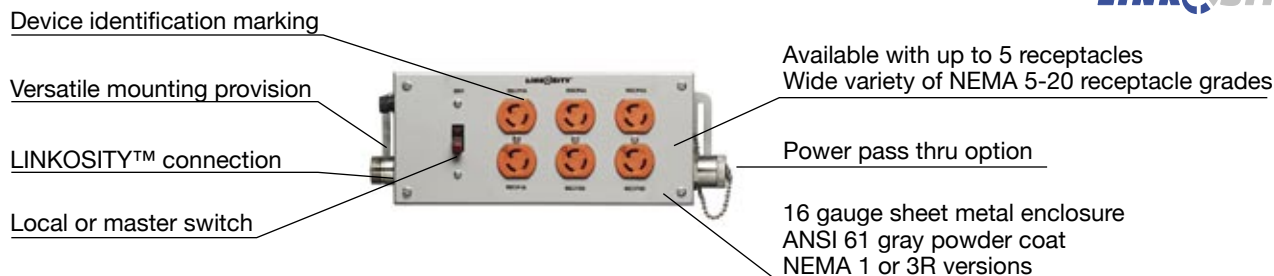
## Multi-Ports

Catalog Numbers	Input	Output	Description
<b>MPI4PNP</b>		<b>MPO4PNP</b>	LINKOSITY™ Multi-Port, 4 Port, PNP
<b>MPI8PNP</b>		<b>MPO8PNP</b>	LINKOSITY™ Multi-Port, 8 Port, PNP



MPI8PNP





## Straight Blade

Device Type	Switch Types	# Recepts	Receptacle Type	Receptacle Feature	Pass-thru
<b>M</b>	<b>SL</b> = Switch Local <b>SM</b> = Switch Master <b>00</b> = No Switch	<b>1</b>	<b>SG</b> = Spec Grade <b>HG</b> = Hospital Grade <b>CR</b> = Corrosion Resistant	<b>IG</b> = Isolated Ground <b>GF</b> = Ground Fault <b>SI</b> = Surge Suppression w/ Isolated Ground <b>SS</b> = Surge Suppression <b>00</b> = Standard	<b>P</b> = Pass-thru <b>0</b> = No Pass-thru
		<b>2</b>			
		<b>3</b>			
		<b>4</b>			
		<b>5</b>			
<b>Example: M</b>	<b>SL</b>	<b>1</b>	<b>SG</b>	<b>00</b>	<b>P</b>

## Twist-Lock®

Device Type	Switch Types	# Recepts	Receptacle Type	Receptacle Feature	Pass-thru
<b>M</b>	<b>SL</b> = Switch Local <b>SM</b> = Switch Master <b>00</b> = No Switch	<b>1</b>	<b>L1</b> = 15A <b>L2</b> = 20A	<b>IG</b> = Isolated Ground <b>00</b> = Standard	<b>P</b> = Pass-thru <b>0</b> = No Pass-thru
		<b>2</b>			
		<b>3</b>			
		<b>4</b>			
		<b>5</b>			
<b>Example: M</b>	<b>00</b>	<b>3</b>	<b>L1</b>	<b>IG</b>	<b>0</b>

Note: Local switches control all receptacles in a box. Master switches control local and downstream receptacles. Consult factory for alternate wiring schemes.

## Switch Only

Device Type	Switch Types	Switch Style	Poles
<b>S</b>	<b>1</b> = 1 Gang	<b>2W</b> = On/Off	<b>1P</b> = Single Pole
	<b>2</b> = 2 Gang	<b>3W</b> = 3 Way	<b>2P</b> = Two Pole
	<b>3</b> = 3 Gang	<b>4W</b> = 4 Way	<b>3P</b> = Three Pole
<b>Example: S</b>	<b>1</b>	<b>2W</b>	<b>1P</b>

Feature	RECEPTACLE TYPES	CR	HG	SG	L1	L2
	<b>00</b> Standard	<b>HBL53CM62</b>	<b>HBL8300GY</b>	<b>CR5362GY</b>	<b>HBL4700</b>	<b>HBL2310</b>
<b>IG</b> Isolated Ground	n/a	<b>IG8300GY</b>	<b>CR5362IGGY</b>	<b>IG4700A</b>	<b>IG2310</b>	
<b>GF</b> Ground Fault	n/a	<b>GF8300GYA</b>	<b>GFR5352GYA</b>	n/a	n/a	
<b>SI</b> Surge Suppression Isolated Ground	n/a	<b>IG8362GYSA</b>	<b>IG5362GYSA</b>	n/a	n/a	
<b>SS</b> Surge Suppression	n/a	<b>HBL8362GYSA</b>	<b>HBL5362GYSA</b>	n/a	n/a	
	SWITCH TYPES					
	<b>SL</b> Local On/Off	<b>HBL1221PL</b>				
	<b>SM</b> Master On/Off	<b>HBL1221PL</b>				



**Features:**

- Shielded
- Super neutral
- K factor 20, copper wound
- Surge Suppression
- Branch circuit protection
- Integral bonding
- Open or enclosed NEMA 1 and 3R designs
- Floor mount



Transformer primary protection and disconnect

Grounding conductor electrode provision

Branch circuit protection

LINKOSITY™ connections

**Power System Supply Assemblies**

Catalog Numbers	KVA	Phase	Input	Cycles	Branch Circuit Output	Circuits	Mounting
<b>P150CUNV208F</b>	15	3-ph	575/480/400 VAC	50/60 Hz	20A 208/120 VAC	3	Floor

Additional custom configurations are possible. Consult factory for wall or rack mount options.



Floor mount units are modular and stackable to achieve greater KVA capacity.

For example, 2 15KVA units can be ganged to create a 30KVA unit.





The three primary components of the LINKOSITY™ power system are Underwriters Laboratories (UL) listed for compliance with the provisions of the applicable standard. The UL standards are:

**Power System Supply Assemblies (PSSAs)**

Listed to UL 508A – Industrial Control Panels

**Connectivity System Components (CSCs)**

Listed to UL 2238 – Inter-connection Devices for Equipment, Sensors and Actuators in Remote Control, Signaling and Power Circuits.  
Listed to UL 50 – Enclosures for Electrical Equipment.

**Power System Distribution Assemblies (PSDAs)**

Listed to UL 5 – Surface Metal Raceway and Fittings

- ✓ LINKOSITY™ power distribution system and methodologies are classified by an OSHA identified Nationally Recognized Testing Lab (NRTL) as compliant with the provisions NFPA 70 / National Electrical Code (NEC) when properly implemented and installed.
- ✓ Compliance with the applicable provisions of these NEC Articles are addressed in the LINKOSITY™ power distribution system design:



<b>Article</b>	<b>Title</b>
<b>200</b>	<i>Use and Identification of Grounded Conductors</i>
<b>215</b>	<i>Feeders</i>
<b>210</b>	<i>Branch Circuits</i>
<b>240</b>	<i>Overcurrent Protection</i>
<b>250</b>	<i>Grounding</i>
<b>280</b>	<i>Surge Arrestors</i>
<b>285</b>	<i>Transient Voltage Surge Suppressors: TVSSs</i>
<b>300</b>	<i>Wiring Methods</i>
<b>310</b>	<i>Conductors for General Wiring</i>
<b>312</b>	<i>Cabinets, Cutout Boxes, and Meter Socket Enclosures</i>
<b>314</b>	<i>Outlet, Device, Pull and Junction Boxes; Conduit Bodies; Fittings; and Manholes</i>
<b>336</b>	<i>Power and Control Tray Cable: Type TC</i>
<b>380</b>	<i>Multioutlet Assemblies</i>
<b>392</b>	<i>Cable Trays</i>
<b>400</b>	<i>Flexible Cords and Cables</i>
<b>408</b>	<i>Switchboards and Panelboards</i>
<b>450</b>	<i>Transformer and Transformer Vaults</i>

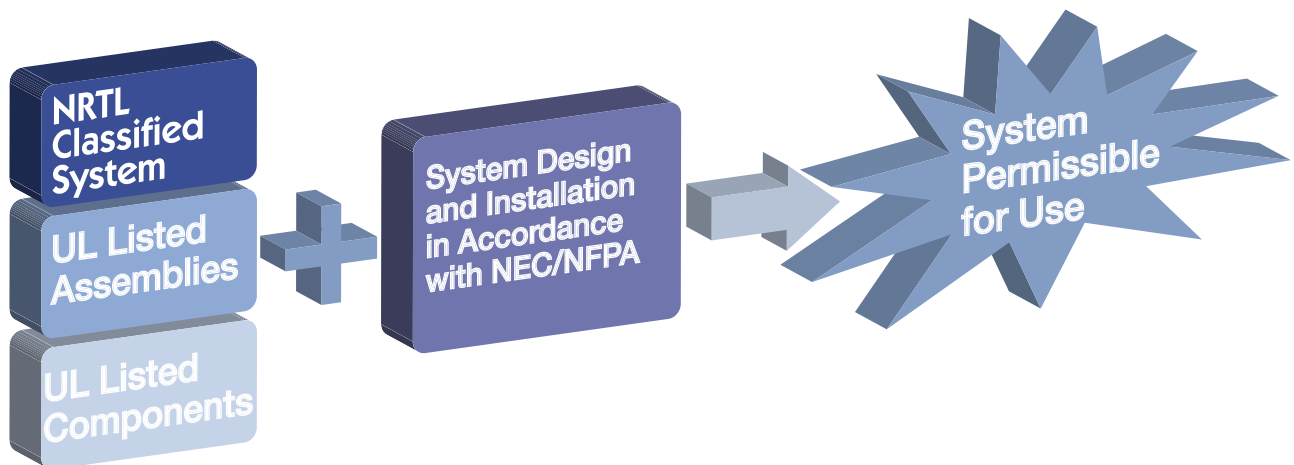


- ✓ LINKOSITY™ power system and methodologies are also classified by a NRTL as compliant with the provisions NFPA 79 Electrical Standard for Industrial Machinery when properly implemented and installed.
- ✓ Compliance with the applicable provisions of these NFPA 79 Chapters as well as the NEC Articles mentioned above are addressed in the LINKOSITY™ power distribution system design:



Article	Title
6	Protection from Electrical Shock
7	Protection of Equipment
8	Grounding
13	Conductors, Cables and Flexible Cords
14	Wiring Practices
17	Marking and Safety Signs
18	Technical Documentation
19	Testing and Verification

*Of special note: NFPA 79 Sections 14.1.2.2 and 14.1.5.1 specifically indicates that molded connectors factory-applied to cable and cord are to be permitted.*



- ✓ LINKOSITY™ power system is intended for use on industrial equipment and industrial and commercial facilities.
- ✗ LINKOSITY™ power system is NOT intended for use in residential applications or in applications requiring a plenum rating.

Economically, LINKOSITY™ power system measures up when compared to a variety of “pipe and wire” installations.

The following analysis compares an installation using LINKOSITY™ components, Electrical Metal Tubing (EMT) and Rigid Metal Conduit (RMC).

The budgetary cost of a LINKOSITY™ power system is within 11% of the same installation done with RMC or EMT. Over the life of an installation, LINKOSITY™ power systems are less than half the cost of conventional methods.

### Cost of Initial Installation

These values represent the initial purchase and installation of the sample electrical system represented on the back of this document.

	TOTAL	LABOR	MATERIAL
<b>LINKOSITY™</b>	\$28,770	\$ 2,991	\$25,779
<b>RMC*</b>	\$29,015	\$20,535	\$ 8,480
<b>EMT*</b>	\$25,862	\$17,743	\$ 8,119

LINKOSITY™ power system at manufacturer’s suggested list price is 99% of RMC and is 111% of EMT.

\* Calculated using RS Means Electrical Cost Data 27th Edition 2004

### Cost of Ownership

The cost of ownership is the total life cycle cost associated with an installation. Disassembly, reuse, demolition and residual value are incorporated into the analysis.

	LINKOSITY™	RMC	EMT
<b>Installed Cost</b>	\$ 28,770	\$29,015	\$25,862
<b>Plus Demolition</b>	\$641	\$3,246	\$2,583
<b>Less Depreciated Residual Value</b>	(\$14,820)	(\$1,326)	(\$1,326)
<b>Total Cost</b>	\$14,591	\$30,935	\$27,120
<b>As Percent</b>	100%	212%	186%

For component level detail cost benefit analysis go to [www.LINKOSITY.com](http://www.LINKOSITY.com)

