Wireless Solutions Portfolio

Liberty

The Company

An accessory ecosystem helping installers optimize wireless radio deployments.

Liberty's infrastructure solutions for wireless networking include antennas for in-building wireless, equipment mounting solutions such as enclosures, racks and cabinets as well the critical cabling solutions demanded by wireless networks such as RF coax cable, structured cable, fiber and various cable management accessories.

Product Lines

- **Liberty Antennas**
- **Liberty Cable**
- **Liberty Enclosures and Mounts**
- **Liberty Metals**
- **Marathon Passives**
- **Marathon Site Hardware**
- **Enconnex Power and Integration**

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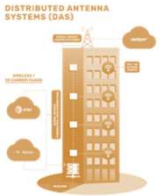
Wireless Networking From Liberty



An accessory ecosystem helping installers optimize wireless radio deployments

Antennas

DAS antennas
Donor | Panel | Ceiling

Target: Outdoor wireless deployments

Ecosystem

Power and Integration

- Headend BOMs include racks and PDU/BBU
- Standard and custom integration opportunities
- Project status = in development

Mounting Solutions and Site Hardware Accessories

Wi-Fi Enclosures and Mounts
Enclosures | Mounts | Ceiling Tiles

Target: Wi-Fi access point deployments

Site Hardware
Roof Mounts | Brackets | Grounding | Tape

Target: Outdoor wireless deployments

RF Components

Bulk Cable, Connectors and Jumpers
Fiber | Structured | RF Coax

Target: Outdoor broadband wireless deployments

Passives
Splitters | Couplers | Taps | Surge

Target: In-building wireless

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DAS Antennas

Donor/LPDA

Panel

Ceiling - Flat

Ceiling - Dome

	Donor/LPDA	Panel	Ceiling - Flat	Ceiling - Dome
Application	• Wireless link to macro tower	• Wireless link to macro tower	• RF signal propagation in-building ceiling tile or hard cap ceilings	• RF signal propagation in-building ceiling tile or hard cap ceilings
Technical	• 617-4000 MHz, 11dBi gain • 617-4000 MHz, 11dBi gain (public safety version)	• Types: SISO, MIMO	• Types: – SISO 617-4000MHz – MIMO 617-4200MHz	• Types: – SISO 617-4200MHz – SISO 380-6000MHz
Key Benefits	• Value alternative	• Value alternative	• Low profile • Excellent price/performance	• Low cost/opening price point

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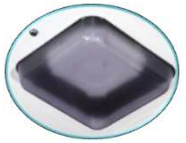
Enclosures and Mounts

Plastic Enclosures

Metal Mounts

Ceiling Tile Enclosures



Snap Caps

Mounting Brackets

	Plastic Enclosures	Metal Mounts	Ceiling Tile Enclosures	Snap Caps	Mounting Brackets
Application	• Protecting Wi-Fi radios and antennas from impact, dust, rain in indoor and outdoor deployments	• Mounting Wi-Fi radios to walls in indoor networks	• Mounting Wi-Fi radios in ceiling tiles or hard cap ceilings	• Aesthetic covers for Wi-Fi radios in indoor environments	• Mounting Wi-Fi radios or antennas in open ceilings (e.g., warehouse)
Technical	• 12 x 11 x 4”T or 6”T • 23 x 12 x 4”T	• Universal right-angle brackets (shown) • Low profile brackets • Radio specific brackets	• Universal designs for 2x2 tiles	• Radio specific designs	• Radio only • Radio and antenna co-location
Key Benefits	• Excellent protection: ABS, gasket • Ease of install: tool-less, adjustable • Flexible color, branding • Made in the USA	• Low cost • Lockable	• Light weight • UL listed	• Snap-on fit • Colors, branding	• Wire management • Ease of install

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Passives

Splitters

Tappers

Couplers

Surge

All Else

	Splitters	Tappers	Couplers	Surge	All Else
Application	• RF signal conditioning for DAS and public safety wireless deployments	• RF signal conditioning for DAS and public safety wireless deployments	• RF signal conditioning for DAS and public safety wireless deployments	• Active equipment surge protection in indoor and outdoor applications	• Active equipment signal conditioning in indoor and outdoor applications
Technical	• Types: 2-way, 3-way, 4-way	• Types: 5, 6, 7, 8, 9, 10, 15, 20 dB	• Types: 5, 6, 7, 8, 9, 10, 15, 20 dB	• Type: Lightning arrestors, PoE surge, kitted solutions	• Types: Attenuators, loads
Key Benefits	• Excellent price/performance	• Excellent price/performance	• Excellent price/performance	• Excellent price/performance	• Excellent price/performance

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Connectivity – RF Cable

RF Coax
Corrugated Hardline

RF Coax
Braided RG8/400 Series

Jumper and
Trunk Cables

Application	• RF feeder cables for long cable runs for tower or roof mounted antennas in DAS and fixed wireless	• Typically, short run jumper cables indoor or outdoor, hard install, wireless broadcast construct	• Connecting radios to antennas

Technical	• Type: Foam dielectric
	• Sizes: ¼" and ½"
	• Jacket/Rating: PE for outdoor, low smoke zero halogen for indoor
		• Type: Foam dielectric
		• Sizes
		  – RG8/RF400- 10 AWG solid bare copper conductors
		  – RG8X/RF240
		  – RG58/RF195 - 19 AWG solid bare copper conductors
		• Jacket/Rating
		  – PE for outdoor
		  – Low smoke zero halogen for indoor
		  – Plenum (CMP) and riser (CMR) for indoor
			• Braided and hardline
			• Standard and custom

Key Benefits	• Compatible with industry connectors • Excellent price/performance	• Rooftop DAS/BDA • WISP networks	• Complete wireless site deployment offer

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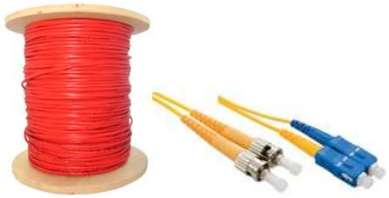
Connectivity – Data Cable



	Cat 5/6/6A	Fiber	Data Networking Components
Application	• Connecting headends and remotes	• Data for headend to remotes	• Ethernet and fiber networking components
Technical	• Type: Cat 5, 6, 6E, 6A • Jacket/Rating: CMR and CMP, DB	• Type: Single mode, multi-mode bulk cable and jumper assemblies • Jacket/Rating: OFNR, OFNP, I/O, OSP	• Type: Patch panels, fiber terminal boxes, wall jacks and adapters
Key Benefits	• End-to-end solution from one source • Excellent price/performance • UL Independent Lab Certified	• Compatible with industry connectors • Excellent price/performance	• Compatible with industry connectors • Excellent price/performance

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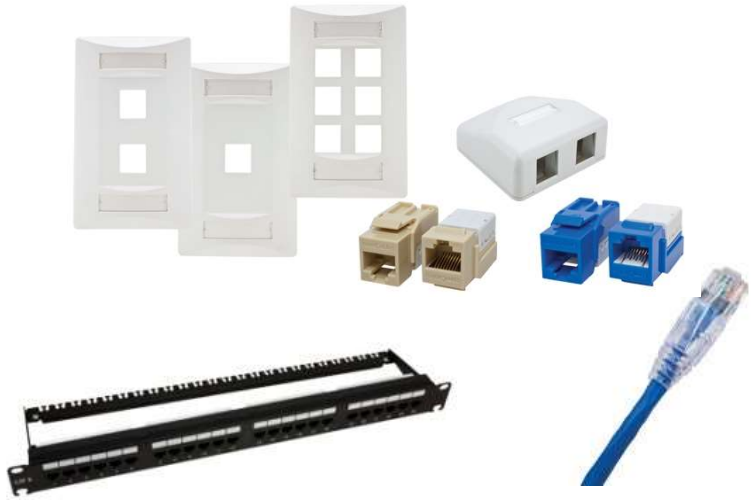
Connectivity – Data Cable Accessories

Structured Cabling
Copper Components



Fiber
Components

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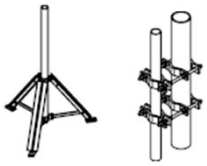
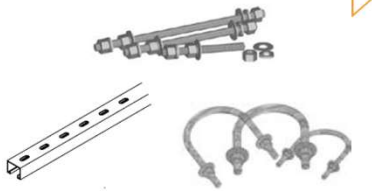
Site Hardware



Antenna Mounting

Cable Management



Site Hardware and Accessories

	Antenna Mounting	Cable Management	Site Hardware and Accessories
Application	• Mounting antennas outdoor on roof tops or existing infrastructure for DAS/BDA and WISP network deployments	• Protecting RF cable installations in outdoor DAS/BDA and WISP network deployments	• General equipment mounting needs in outdoor deployments
Technical	• Various standard and custom solutions	• Grounding kits • Weatherproofing • Adapters, hoisting grips	• U-bolts, clamps, c-channel, pipe/mast, standoffs
Key Benefits	• Complete wireless site deployment offer	• Complete wireless site deployment offer	• Complete wireless site deployment offer

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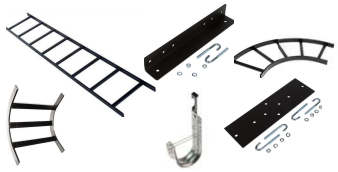
Infrastructure

Racks

Cable Managers



Cable Runways

	Racks	Cable Managers	Cable Runways
Application	• Floor and wall mounted racks for servers and associated equipment • Accessories	• Cable management and equipment support • Vertical and horizontal cable managers	• Cable management and support
Technical	• Extruded aluminum and 12-gauge steel • Powder coated	• Steel and aluminum/plastic construction	• Tubular and sheet steel construction • Straight and curved sections • Support brackets and hardware • Standard and multi-function J-hooks: stress-free cable support, pre-galvanized steel (G60) • Wire basket tray (coming soon)
Key Benefits	• Value-priced products for non-brand sensitive customers • Major items UL listed • Made in the USA • Most items in stock • Custom sizes and configurations may be available	• Value-priced products for non-brand sensitive customers • UL listed • Made in the USA • Most items in stock • Future offerings include wire basket trays and channel struts	• Value-priced products for non-brand sensitive customers • Major items UL listed • Made in the USA • Most items in stock • Future offerings include wire basket trays and channel struts

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Infrastructure

Racks and Cabinets

Power: UPS and PDUs

Connectivity: Network Cabling and Power Cords

	Racks and Cabinets	Power: UPS and PDUs	Connectivity: Network Cabling and Power Cords
Application	• Plug-and-play micro-data center solutions for on-premises edge networking • Brand new, full-featured, highly configurable solution with improved load ratings and cable and thermal management	• Rack mounted power systems – UPS and PDU	• Comprehensive line of network and power cabling products for data centers, IT infrastructure and network gear
Technical	• InfiniRack allows companies to "design their own cabinet" • Exceptional cable management options • Robust load ratings and airflow efficiency • Self-contained cabinet with cooling, monitoring, security and management capabilities	• UPS: Lithium ion or VRLA – Engineered to suit the backup power needs of most common IT environments – Provide clean, reliable power in a compact 2U form factor • PDUs: – Robust line of basic, metered, switched and universal PDUs	• Fiber, copper, transceivers, DAC and AOC, adapters, panels and cassettes • 100% tested • Local manufacturing of Cat6 and Cat6a • Power Cords: Variety of lengths, sizes and colors • Power Cords:: Environmentally friendly TPE and cost-effective PVC jacket materials
Key Benefits	• Available in weeks, not months • Feature-rich ability to meet specifications • Competitively priced	• Reliable, cost-effective PDUs for network server racks and cabinets	• Excellent price/performance value

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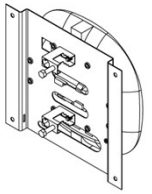
Integration and Kitting



	Class 4 Power and Integration	Kitting	Custom Designed Solutions
Application	• A network backbone system connecting power and data via hybrid cable – indoor or outdoor – to network PoE switches for security, wireless and IoT end points • Enabled by Voltserver Digital Electricity – Class 4, fault managed power	• Integrating national brand and private label components	• Product development and optimization of existing hardware
Technical	• Headend and rack transmitter kits • Remote and zone enclosure receivers	—	• Metal brackets, steel site hardware • ABS enclosures
Key Benefits	• Delivering 2000 Watts of power up to 2000 meters from a centralized power source at the headend • New technology vs. Class 1 power systems	• Order and inventory simplicity with one SKU to manage • Collection of multiple components tagged and labeled • Turnkey and custom configured solutions	• Turnkey and custom engineered solutions for complex or large projects

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Thank you.

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