

Product Data: Emergency Responder Radio Communications System Highland Elementary School Addition and Renovation

November 18, 2023



ERCES Contractor:

ADT Commercial
Jacob Doyle
3821 Powhatan Road
Clayton, NC 27520
email: jacobdoyle@adt.com

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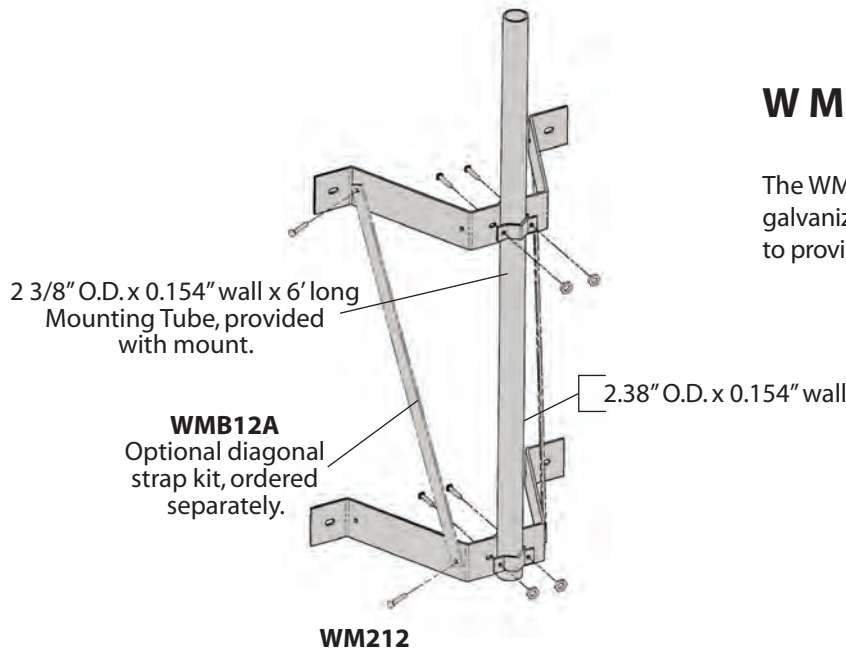
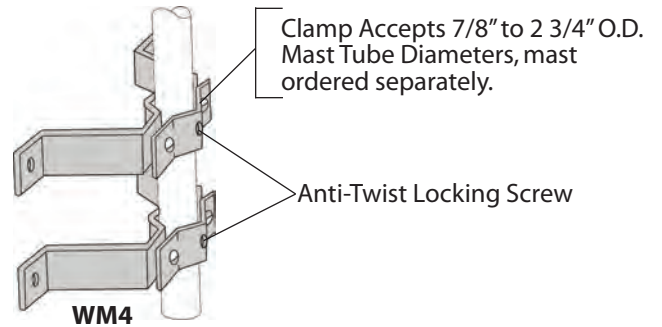
Project Description

Project name:	Highland Elementary – Addition and Renovation		
Project address:	1915 Buffalo Lake Road, Sanford, NC 27332		
Venue description:	Classroom addition to existing elementary school.		
Applicable Fire Code:	<i>IBC:</i>		<i>2018</i>
	<i>IFC:</i>		<i>2018</i>
	<i>NFPA 1225, CHAPTER 18:</i>		<i>2022</i>
	<i>NFPA 70 (NEC):</i>		<i>2019</i>
	<i>NFPA 780:</i>		<i>2020</i>
Specifications section:	<i>Not specified, although required by IFC</i>		

Signal Source Equipment

WM4

The WM4 mount provides 3" clearance to the wall. The WM4 is hot-dip galvanized for corrosion protection. Masts are held in place with a unique "Anti-Twist" locking clamp. This mount includes (4) 1/4" dia. x 2" long lag screws for mounting.



WM212

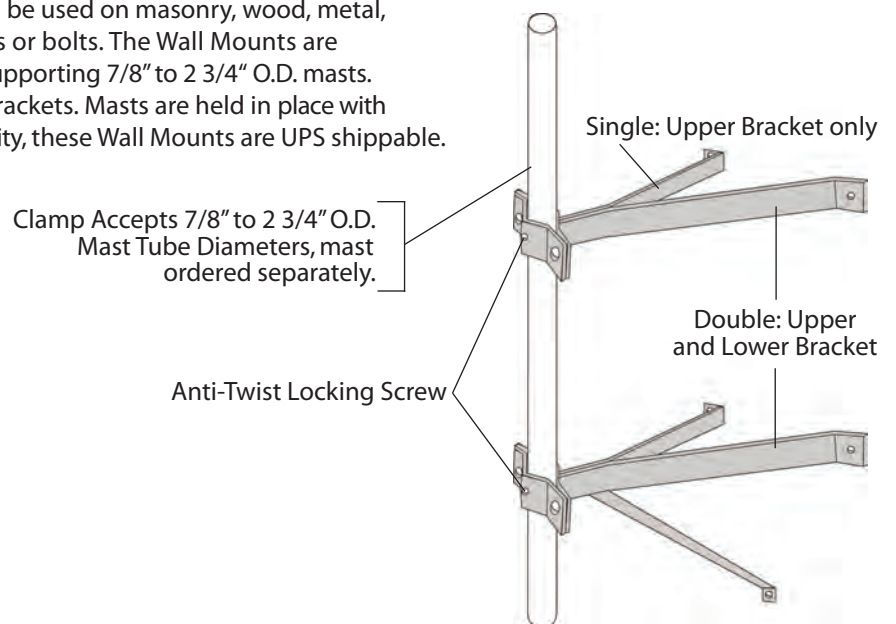
The WM212 mount provides 12" clearance to the wall. The WM212 is hot-dip galvanized for corrosion protection. Optional WMB12A diagonal is available to provide extra strength. Mount is pre-drilled to accept 1/2" dia. connectors.

EXTENDED WALL MOUNT ASSEMBLIES

Single and double extended wall mount assemblies can be used on masonry, wood, metal, and other types of walls using up to 1/4" dia. lag screws or bolts. The Wall Mounts are versatile, coming in a variety of stand off lengths and supporting 7/8" to 2 3/4" O.D. masts. The mounts are available as single brackets or double brackets. Masts are held in place with a unique "Anti-Twist" locking clamp. Galvanized for durability, these Wall Mounts are UPS shippable.

Single:	Wall Clearance
WM6S	6" clearance
WM8S	8" clearance
WM12S	12" clearance
WM18S	18" clearance
WM24S	24" clearance
Double:	Wall Clearance
WM8D	8" clearance
WM12D	12" clearance
WM18D	18" clearance
WM24D	24" clearance

NOTE: Connectors to wall not included.



Westell® | 746-896 MHz Yagi Antenna



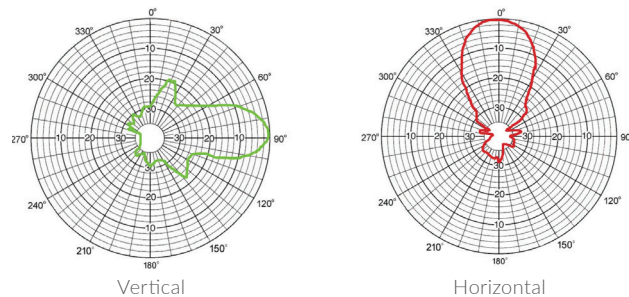
General Information

Westell's 746-896 MHz Yagi Antenna is excellent for Public Safety applications. The eight-element construction provides exceptional performance and durability and is useful for directional point-to-point, or point-to-multipoint applications.

Product Highlights

- 11 dBi Gain
- 746-896 frequency range
- 8 elements
- Hermetically sealed driven element
- Rugged anodized aluminum lightweight design
- Stainless-steel mounting hardware

Radiation Patterns



746-896 MHz Yagi Antenna, 11 dBi

Ordering information

Part Number	Descriptions
CS03-003-430	CSI-AY/746-896/11

Electrical Specifications

Gain	11 dBi
VSWR	<1.7:1
Horizontal beamwidth	48°
Vertical beamwidth	42°
Polarization	Vertical
Maximum input power	100 Watts
Electrical downtilt	0°
Front-back ratio	>16 dB

Specifications subject to change without notice.

Mechanical Specifications

Number of elements	8
Connector	N-Female
Lightning protection	Direct ground
Rated wind speed	134 mph
Frontal wind load	11.2 lbf
Lateral windload	8.2 lbf
Dimensions	33.1 x 8 x 2.2 in
Antenna weight	1.76 lbs
Mounting hardware	U-Bolt
Included mounting hardware fits 1.18"-2.36" inch OD pipe	



WESTELL.COM

Product Specifications

SG12-12B2U

SureGround™ Grounding Kit for 1/2 in coaxial cable



CHARACTERISTICS

Dimensions

Nominal Size	1/2 in
Bonding Conductor Length	1219.2 mm 48 in
Cable Jacketing Removal Length, maximum	38.1 mm 1 1/2 in
Cable Jacketing Removal Length, minimum	38.1 mm 1 1/2 in
Compatible Diameter, maximum	16.510 mm 0.650 in
Compatible Diameter, minimum	15.494 mm 0.610 in

Electrical Specifications

Current Handling	Tested to withstand 100,000 amps peak current surge
Current Handling Test Method	MIL-STD-1757
Grounding, Bonding and Shielding Test Method	MIL-STD-188-124A
Lightning Protection Test Method	IEC 1024-1

General Specifications

Cable Type	Corrugated Smoothwall
Grounding Kit Type	SureGround™ Grounding Kits
Brand	SureGround™
Color	Black
Bonding Conductor Material	Copper
Bonding Conductor Wire Size	6 gauge
Bonding Conductor Jacketing Material	PE
Grounding Strap Material	Tinned copper
Includes	Grounding kit Hardware Lug One roll of 2 in PVC tape One roll of 24 in butyl rubber tape
Locking Bail Material	Stainless steel
Lug Attachment	Field attached
Lug Type	Two-hole lug
Package Quantity	1
Rivet Material	Tinned copper
Weatherproofing Method	Butyl and electric tape

Product Specifications

SG12-12B2U

Mechanical Specifications

Blowing Rain Test Method	MIL-STD-810, Method 506
Corrosion Test Method	MIL-STD-1344, Method 1001
Freezing Rain/Icing Test Method	MIL-STD-810, Method 521
Humidity Test Method	MIL-STD-1344, Method 1002
Immersion Test Method	IEC 60529:2001, IP68
Operating Temperature	-40 °C to +85 °C (-40 °F to +185 °F)
Storage Temperature	-40 °C to +80 °C (-40 °F to +176 °F)
Thread Size	3/8 in
UV Resistance Test Method	MIL-STD-810, Method 505
Vibration Test Method	MIL-STD-202, Method 214

Packed Dimensions

Height	447.0 mm 17.6 in
Length	177.8 mm 7.0 in
Shipping Weight	0.59 kg 1.30 lb
Width	395.2 mm 15.6 in

Included Products



9905-71

Black 2 in PVC Tape, 20 ft



42615-10

Butyl Rubber Tape, 24 in

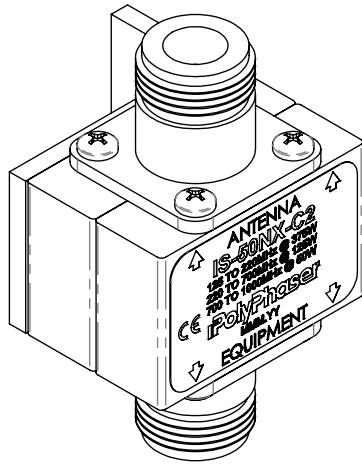
* Footnotes

Grounding, Bonding and Shielding Test Method	Military Standard for Grounding, Bonding, and Shielding: Bond Resistance Requirement of a Maximum dc resistance of 0.001 ohms
Lightning Protection Test Method	Protection Against Lightning Electromagnetic Impulse, Table 1— Protection Level III–IV, 1995-02

800.949.7079

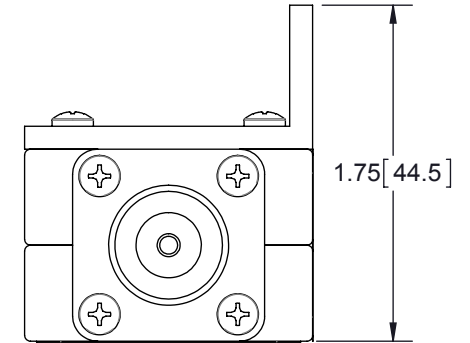
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REVISIONS				
REV.	DESCRIPTION	ECN	DATE	APPROVED
G	REFER TO ECN	11902	8/9/13	JLJ



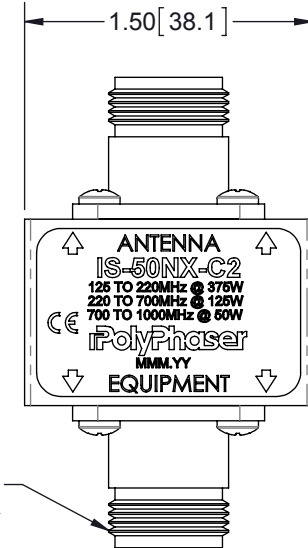
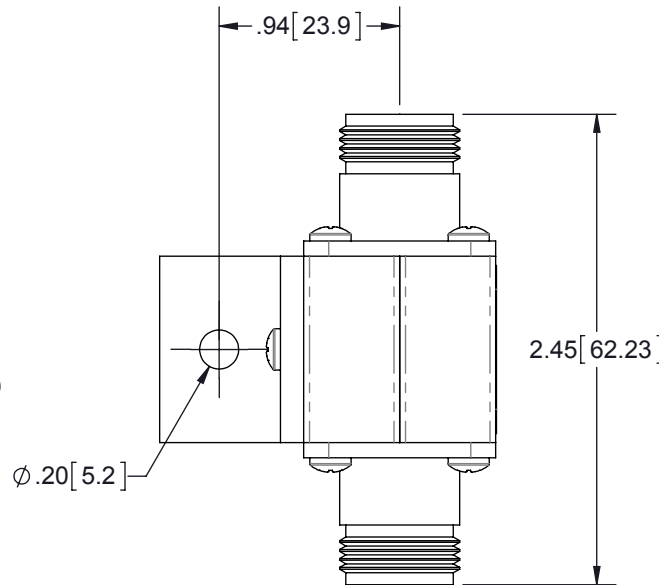
HARDWARE KIT INCLUDES:

QTY	DESCRIPTION
1	SCREW 10-32 X .50 SLOT F PAN 4-10 SS
1	SCREW 10-32x.50 SLOT MS PAN 18-8 SS
1	NUT 10-32 HEX 18-8 SS
2	WASHER 10 EXT TOOTH SS STAINLESS STEEL



MAXIMUM CHARACTERISTICS

- APPLICATION:**
TWO WAY RADIO AND SCADA APPLICATIONS
NON-WEATHERIZED, FLANGE MOUNT
- SURGE:**
50kA IEC 61000-4-5 8/20µs WAVEFORM (TESTED)
20kA (RATED)
- TURN-ON:**
600Vdc ±20%
- TURN-ON TIME:**
2.5ns FOR 2kV/ns
- FREQUENCY RANGE:**
125MHz TO 1GHz
- VSWR:**
≤1.1:1 OVER FREQUENCY RANGE
- INSERTION LOSS:**
≤0.1dB OVER FREQUENCY RANGE
- MAX POWER:**
375W @ 125MHz TO 220MHz
125W @ 220MHz TO 700MHz
50W @ 700MHz TO 1000MHz
- THROUGHPUT ENERGY:**
≤220µJ FOR 3kA, 8/20µs WAVEFORM
- TEMPERATURE:**
STORAGE: -55°C TO +85°C
OPERATING: -50°C TO +50°C
- VIBRATION:**
1G UP TO 100Hz
- CE COMPLIANT**
RoHS COMPLIANT



CUSTOMER APPROVAL: _____ DATE: _____

ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

<small>UNLESS OTHERWISE SPECIFIED LEADING DIMENSIONS ARE INCHES DIMENSIONS IN [] ARE MILLIMETERS</small> TOLERANCES: FRACTIONS=± 1/32 .XX=± .03 ANGLES=± 1° .XXX=± .010 <small>NOTICE: THE INFORMATION AND DESIGN IN THIS DOCUMENT IS THE PROPERTY OF POLYPHASER CORPORATION. ALL RIGHTS RESERVED.</small>	<small>DRAWN</small> J. CALLISTER <small>ENG APPD</small> J. JONES <small>PRODUCT MGR</small>	<small>DATE</small> 9/21/93 <small>4/12/95</small>		<small>SHEET</small> 1 OF 1 <small>SCALE</small> 1:1		
	<small>MARKETING APPD</small> R. MATHEUS <small>PROJECT NO.</small>	<small>DATE</small> 4/12/95		<small>TITLE</small> BROADBAND 125-1000MHz R50 T.O. 600Vdc N FEM <small>CUSTOMER SPECIFICATION</small>		
<small>THIRD-ANGLE PROJECTION</small> 	<small>DOCUMENT NAME</small> IS-50NX-C2-C	<small>SIZE</small> A	<small>CAGE</small> 61114	<small>PROD CAT</small> RFP	<small>PART NUMBER</small> IS-50NX-C2	<small>REV</small> G

Product Specifications

UGBKIT-0210

Copper Ground Buss Bar, 1/4 in x 2 in x 10 in (6.4 mm x 50.8 mm x 254.0 mm)



CHARACTERISTICS

Dimensions

Height	50.80 mm 2.00 in
Length	254.00 mm 10.00 in
Hole Size	7/16 in 7/16 in x 5/8 in

General Specifications

Material Type	Copper
Hole Distance, center to center	19.05 mm 3/4 in
Includes	Angle adapters Grounding bar Insulators Mounting brackets Universal hardware
Package Quantity	1

Mechanical Specifications

Material Thickness	6.350 mm 1/4 in
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Packed Dimensions

Height	406.4 mm 16.0 in
Length	63.5 mm 2.5 in
Shipping Weight	1.81 kg 4.00 lb
Width	381.0 mm 15.0 in

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LDF4-50A

LDF4-50A, HELIAX® Low Density Foam Coaxial Cable, corrugated copper, 1/2 in, black PE jacket

Construction Materials

Jacket Material	PE
Outer Conductor Material	Corrugated copper
Dielectric Material	Foam PE
Flexibility	Standard
Inner Conductor Material	Copper-clad aluminum wire
Jacket Color	Black

Dimensions

Nominal Size	1/2 in
Cable Weight	0.15 lb/ft 0.22 kg/m
Diameter Over Dielectric	12.954 mm 0.510 in
Diameter Over Jacket	15.875 mm 0.625 in
Inner Conductor OD	4.8260 mm 0.1900 in
Outer Conductor OD	13.970 mm 0.550 in

Electrical Specifications

Cable Impedance	50 ohm \pm 1 ohm
Capacitance	23.1 pF/ft 75.8 pF/m
dc Resistance, Inner Conductor	0.450 ohms/kft 1.480 ohms/km
dc Resistance, Outer Conductor	0.820 ohms/kft 2.690 ohms/km
dc Test Voltage	4000 V
Inductance	0.190 μ H/m 0.058 μ H/ft
Insulation Resistance	100000 Mohms•km
Jacket Spark Test Voltage (rms)	8000 V
Operating Frequency Band	1 – 8800 MHz
Peak Power	40.0 kW
Velocity	88%

Environmental Specifications

Installation Temperature	-40 °C to +60 °C (-40 °F to +140 °F)
Operating Temperature	-55 °C to +85 °C (-67 °F to +185 °F)
Storage Temperature	-70 °C to +85 °C (-94 °F to +185 °F)

General Specifications

Brand	HELIAX®
Ordering Note	CommScope® standard product (Global)

Mechanical Specifications

Bending Moment	3.8 N-m 2.8 ft lb
Flat Plate Crush Strength	110.0 lb/in 2.0 kg/mm

IDF4-50A

Minimum Bend Radius, Multiple Bends	127.00 mm 5.00 in
Minimum Bend Radius, Single Bend	50.80 mm 2.00 in
Number of Bends, minimum	15
Number of Bends, typical	50
Tensile Strength	113 kg 250 lb

Note

Performance Note Values typical, unless otherwise stated

Standard Conditions

Attenuation, Ambient Temperature	20 °C 68 °F
Average Power, Ambient Temperature	40 °C 104 °F
Average Power, Inner Conductor Temperature	100 °C 212 °F

Return Loss/VSWR

Frequency Band	VSWR	Return Loss (dB)
680–800 MHz	1.13	24.30
800–960 MHz	1.13	24.30
1700–2200 MHz	1.13	24.30
2300–2700 MHz	1.13	24.30

Attenuation

Frequency (MHz)	Attenuation (dB/100 m)	Attenuation (dB/100 ft)	Average Power (kW)
0.5	0.149	0.045	40.00
1	0.211	0.064	36.11
1.5	0.259	0.079	29.46
2	0.299	0.091	25.50
10	0.672	0.205	11.35
20	0.954	0.291	7.99
30	1.172	0.357	6.51
50	1.521	0.463	5.02
85	1.995	0.608	3.82
88	2.031	0.619	3.76
100	2.169	0.661	3.52
108	2.256	0.688	3.38
150	2.673	0.815	2.85
174	2.887	0.88	2.64
200	3.103	0.946	2.46
204	3.135	0.956	2.43
300	3.835	1.169	1.99
400	4.462	1.36	1.71
450	4.749	1.447	1.61
500	5.021	1.53	1.52
512	5.085	1.55	1.50
600	5.533	1.686	1.38
700	6.009	1.831	1.27
800	6.456	1.968	1.18
824	6.56	1.999	1.16
894	6.855	2.089	1.11
960	7.124	2.171	1.07

IDF4-50A

1000	7.284	2.22	1.05
1218	8.11	2.472	0.94
1250	8.226	2.507	0.93
1500	9.093	2.771	0.84
1700	9.744	2.97	0.78
1800	10.058	3.066	0.76
2000	10.666	3.251	0.72
2100	10.961	3.341	0.70
2200	11.251	3.429	0.68
2300	11.535	3.516	0.66
2500	12.09	3.685	0.63
2700	12.627	3.849	0.60
3000	13.407	4.086	0.57
3400	14.401	4.389	0.53
3700	15.118	4.608	0.50
4000	15.815	4.82	0.48
5000	18.01	5.489	0.42
6000	20.055	6.113	0.38
8000	23.826	7.262	0.32
8800	25.244	7.694	0.30

* Values typical, guaranteed within 5%

Regulatory Compliance/Certifications

Agency

RoHS 2011/65/EU

China RoHS SJ/T 11364-2006

ISO 9001:2008

Classification

Compliant

Below Maximum Concentration Value (MCV)

Designed, manufactured and/or distributed under this quality management system



Headend Radio Equipment

CriticalPoint™ Version 3 / Next Generation Public Safety Solution

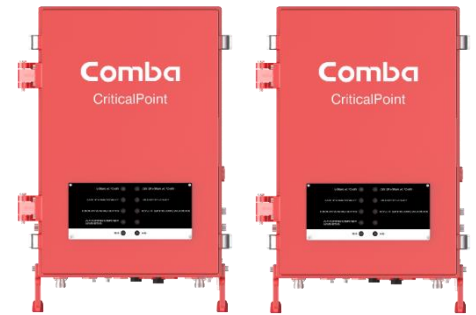
Public Safety 700/800MHz Class A/B 27/33dBm Fiber DAS and Battery Backup Unit

Public Safety Standards Compliance

- Complies with IFC / NFPA / UL2524
- FCC Class A: **TBD** / Class B: **TBD**
- UL 2524 Standard Certified – SGS Certificate No.: **TBD**
- ISED (IC): **TBD**
- UL50E Type 4 / NEMA 4 enclosure for BDA / BBU

Fiber DAS System

- Supports P25 P1/P2, digital and conventional analog communications simultaneously
- Built-in cavity filtering to protect the unit from interference from FirstNet Band 14 and other neighbor bands
- Support up to 32 Remote Units
- Both Master Unit and Remote Units have the same output power for coverage
- Up to 64 channels per band on single band models; up to 96 channels shared across bands on dual band models (maximum of 64 on individual band) (Class A)
- Channelized (Class A) / Wideband Auto Level Control (ALC) supported
- Downlink and Uplink squelch supported
- NetProtect™ Uplink PA shutdown during no traffic periods to minimize noise being introduced to the network
- Built-in mandatory isolation test to prevent system oscillation
- Auto shutdown with alarm upon oscillation detection
- Web based GUI for intelligent configuration, SNMP supported
- Integrated Battery Charger Unit, Comba BBU V2 / BBU V3/NG supported
- License based switching between Class A or Class B, Single band or Dual band, 0.5W or 2W configurations
- NFPA / IFC / UL 2524 compliant dry contact alarms and built-in visual / audio annunciator
- Additional external Comba Annunciator Panel supported



Master Unit

Remote Unit



Fiber Optical Unit

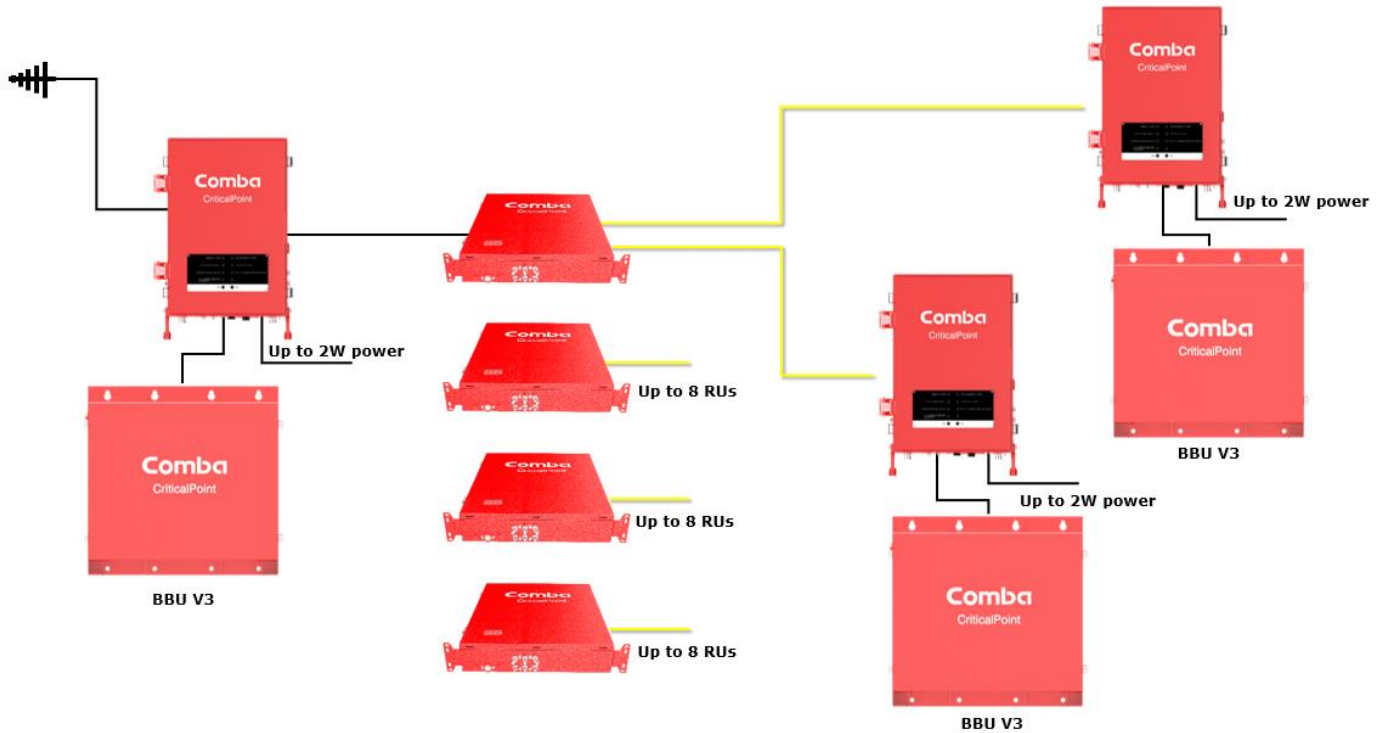
Battery Backup Unit

- Optional dedicated Battery Backup Solution for BDA & DAS V3/NG platform
- Powered by Lithium Iron Phosphate (LiFePO4) batteries
- Provides 12 hours backup time with 30AH battery option
- Provides 24 hours backup time with 60AH battery option
- Provides 48 hours backup time with 100AH battery option
- Provides connections for EPO (Emergency Power Off) switch
- Provides AC convenience outlet inside BBU



Battery Backup Unit

Typical System Block Diagram



Specifications – Fiber Optic Unit

Frequency Band	MHz	758 - 869
Optical Wavelength Uplink	nm	1310
Optical Wavelength Downlink	nm	1550
Optical Connector Type		SC-APC
Optical Fiber Type		Single Mode, WDM (single strand of fiber per Remote Units)
VSWR		≤ 1.5
Number of RU supported per FOU		Up to 4 or 8 RU per FOU
Number of FOU supported per MU		Up to 4
Number of RU supported per MU		Up to 32

Mechanical Specifications – Fiber Optic Unit

Dimensions, H x W x D		in(mm)	18.5 x 15.8 x 3.4 (470 x 400 x 87)
Weight (without bracket)	4 Port	lb(kg)	25.4 (11.5)
	8 Port	lb(kg)	27.6 (12.5)
Power Consumption (approx.)	4 Port	W	15
	8 Port	W	20
Power Supply		VDC	+28 (From Master Unit)
Enclosure Cooling			Convection
Operating Temperature		°F (°C)	-40 to +131 (-40 to +55)
Operating Humidity			≤ 95%
Enclosure Class			UL50E Type 4 / NEMA 4

Note: Typical specifications at room temperature

RF Specifications – System (MU and RU)

		700MHz	800MHz
Passband (Downlink / Uplink)	MHz	Configuration S0 – 700MHz: 758-775 / 788 – 805, 800MHz: 851-861 / 806-816 Configuration S1 – 700MHz: 769-775 / 799 – 805, 800MHz: 851-861 / 806-816 Configuration C0 – 700MHz: 768-776 / 798 – 806, 800MHz: 851-869 / 806-824	
Total Output Power, Uplink	dBm	27 (Master Unit Only)	
Total Output Power, Downlink	dBm	27 / 33 (Master and Remote Units)	27 / 33 (Master and Remote Units)
Maximum System Gain (Uplink / Downlink)	dB	90	90
Gain Adjustment Range (1dB step) *	dB	60-90 / 35-65 / 10-40 (Under different gain limit modes)	60-90 / 35-65 / 10-40 (Under different gain limit modes)
Pass Band Ripple, p-p (Uplink / Downlink)	dB	S0: ≤3, S1: ≤7	S0: ≤3, S1: ≤7
Uplink Noise Figure	dB	<5 (90dB Uplink Gain), <9 (67dB Uplink Gain)	
Intermodulation	dBm	≤ -13	≤ -13
Spurious	dBm	FCC Compliance	FCC Compliance
Maximum RF Input Level without Damage	dBm	0	0
Maximum RF Input Level without Overdrive	dBm	-10	-10
Input VSWR		≤ 2	≤ 2
Impedance	Ω	50	50

*Gain adjusts down to 10dB total gain but is no longer FCC compliant for NF at that level

Class A and Specialized Filtering			
Number of Filters Downlink			64 Max per single band 96 Max (shared both bands) for 700/800MHz dual band
Number of Filter Uplink			64 Max per single band 96 Max (shared both bands) for 700/800MHz dual band
Filter Bandwidth		KHz	12.5/25/37.5/50/75/100/150**
Filter	Bandwidth (kHz)	Delay(μs)*	Out-of-Band Suppression
High rejection Filter Set	12.5	≤50 (MU Only: ≤48)	≥ 60dBc @ filter edge + 30KHz
	25	≤32 (MU Only: ≤30)	≥ 60dBc @ filter edge + 50KHz
	75	≤20 (MU Only: ≤18)	≥ 60dBc @ filter edge + 130KHz
	75 LD	≤17 (MU Only: ≤15)	≥ 60dBc @ filter edge + 200KHz
Low Delay Filter Set	12.5	≤32 (MU Only: ≤30)	≥ 60dBc @ filter edge + 65KHz
	25	≤29 (MU Only: ≤27)	≥ 60dBc @ filter edge + 75KHz
	37.5	≤28 (MU Only: ≤26)	≥ 60dBc @ filter edge + 75KHz
	50	≤28 (MU Only: ≤26)	≥ 60dBc @ filter edge + 100KHz
	75	≤17 (MU Only: ≤15)	≥ 60dBc @ filter edge + 200KHz
	100	≤16 (MU Only: ≤14)	≥ 60dBc @ filter edge + 200KHz
	150	≤15 (MU Only: ≤13)	≥ 60dBc @ filter edge + 205KHz

*Actual delay number is various according to version, system delay (MU+RU, including 1m of Fiber)

**BDA does not comply with FCC Class A regulation if any filters that are wider than 75KHz are used. Users must use a Class B FCC Label and register the BDA on FCC's WEB Site. Contact Comba Customer Service for support.

Class B Wide Band Filtering			
Number of Filters			3
Filter Bandwidth		MHz	0.6-10
System Group Delay		μsec	≤ 14
Out-of-Band Suppression		dBc	≥ 60 @ filter edge + 1MHz

Mechanical Specification - MU

Dimensions, H x W x D	mm / in	330 x 490 x 199 / 13.0 x 19.3 x 7.8	
Weight (without bracket)	kg / lbs	25 / 55.1	
Power Supply Input	VAC	100-240V / 50-60Hz / 0-4.5A	
Power Supply Output	VDC	40-60V (Typical: 53.5V) / 0-7.5A	
DC Output for external devices		Typical 53.5V, Floating DC output, Max 100W	
Maximum Charging Current	A	5	
Power Consumption		27 dBm	33 dBm
	Single Band	<75	<90
	Dual Band	<85	<100
Enclosure Cooling		Convection	
Main RF Connectors		N-Female (MT, DT)	
RF Connectors for Fiber DAS expansion		SMA-Female (FOU DL, FOU UL)	
RF Test Port		SMA-Female (DT-Test, MT-Test), -28dB coupling	
Dry Contact Alarm Visual Annunciation		Dry Contact Alarm LED 1-8, ALM, RUN (LED test supported)	
Dry Contact Alarm Audible Annunciation		Buzzer (Mute and Lamp Test supported)	
Communication port		RJ45 (LAN, OMT)	
Dry Contact Alarm Output		8	
External Alarm Input		5 (#5 is pre-configured for Door Open Alarm)	
Reserved Knockouts		3/4-inch hole x 1, 1/2-inch hole x 3, 1-inch hole x2	
Operating Temperature and Humidity	°C	-40 to +55, ≤ 95%	
Environmental Class		UL50E Type 4 / NEMA 4	
MTBF	Hr	100,000	

Mechanical Specification - RU

Dimensions, H x W x D	mm / in	330 x 490 x 199 / 13.0 x 19.3 x 7.8	
Weight (without bracket)	kg / lbs	25 / 55.1	
Power Supply Input	VAC	100-240V / 50-60Hz / 0-4.5A	
Power Supply Output	VDC	40-60V (Typical: 53.5V) / 0-7.5A	
DC Output for external devices		Typical 53.5V, Floating DC output, Max 100W	
Maximum Charging Current	A	5	
Power Consumption		27 dBm	33 dBm
	Single Band	<75	<90
	Dual Band	<85	<100
Enclosure Cooling		Convection	
Main RF Connectors		N-Female (MT)	
RF Test Port		SMA-Female (MT-Test), -28dB coupling	
Dry Contact Alarm Visual Annunciation		Dry Contact Alarm LED 1-8, ALM, RUN (LED test supported)	
Dry Contact Alarm Audible Annunciation		Buzzer (Mute and Lamp Test supported)	
Communication port		RJ45 (LAN, OMT)	
Dry Contact Alarm Output		8	
External Alarm Input		5 (#5 is pre-configured for Door Open Alarm)	
Reserved Knockouts		3/4-inch hole x 1, 1/2-inch hole x 3, 1-inch hole x2	
Operating Temperature and Humidity	°C	-40 to +55, ≤ 95%	
Environmental Class		UL50E Type 4 / NEMA 4	
MTBF	Hr	100,000	

Mechanical Specification - Battery Backup Unit

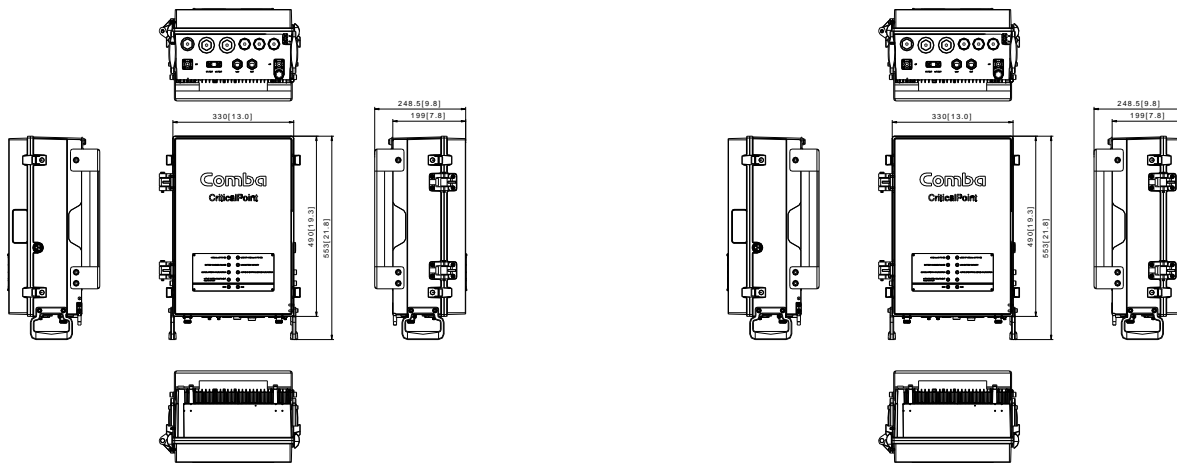
Dimensions, H x W x D	mm / in	605 x 500 x 272.9 / 23.8 x 19.7 x 10.7
Weight (without battery)	Kg / lbs	26 / 57.3
Reserved Knockouts		3/4-inch hole x 4, 1/2-inch hole x 6
Operating Temperature	°F (°C)	32 to 104 (0 to 40)
Operating Humidity		≤ 95%
Enclosure Environmental Class		UL50E Type 4 / NEMA 4

Specification - Battery

Battery Type		(Lithium Iron Phosphate) LiFePO4		
System Required Quantity	pcs	1	1	1
Capacity, Discharge @ 0.33C	AH	30	60	100
Nominal Voltage	VDC	51.2	51.2	51.2
Charging@2A, from 30%	Hour	10.5	21	35
Backup Hours		51.2 * 30 / Load	51.2 * 60 / Load	51.2 * 100 / Load
Battery Weight	lb(kg)	52.9 (24)	79.8 (36.2)	123.5 (56)
Battery Electrolyte Counts		0.456 Gallons / 4.6 lbs	0.913 Gallons / 9.1 lbs	1.758 Gallons / 17.6 lbs
BMS Comm. Port		Serial port (RS485)		

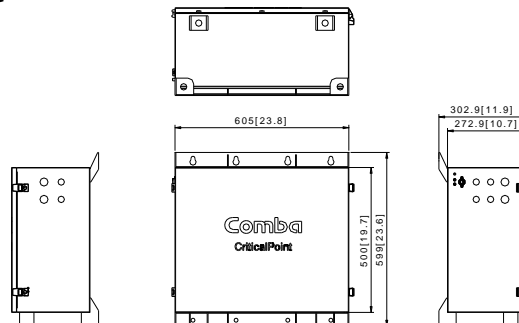
*Typical specifications at room temperature

Outline Drawing



Master Unit V3 NG

Remote Unit V3 NG



BBU V3 NG

Part Numbers

RX78V3 - A 33 27 P0 - S1

	BDA Band Configuration S0 = 700MHz NB, 800MHz NB, FirstNet, ESMR S1 = 700MHz NB, 800MHz NB, High Rejection Duplexers C0 = Canada Version
	BDA Power Supply P0 = AC input with internal Charger
	BDA UL Power 27 = 27dBm
	BDA DL Power 33 = 33dBm 27 = 27dBm
	BDA Class A = Class A B = Class B
	BDA Authorized Band 07 = 700MHz single band 08 = 800MHz single band 78 = 700MHz and 800MHz dual band
	Master Unit / Remote Unit RX = Master Unit RH = Remote Unit

Master Unit V3 NG

BDA Part Numbers	Band	Class	DL PWR	Duplexer Configuration
RX78V3-A3327P0-XX	700/800MHz	Class A	33dBm	XX=S1/S0/C0
RX07V3-A3327P0-XX	700MHz	Class A	33dBm	XX=S1/S0/C0
RX08V3-A3327P0-XX	800MHz	Class A	33dBm	XX=S1/S0/C0
RX78V3-A2727P0-XX	700/800MHz	Class A	27dBm	XX=S1/S0/C0
RX07V3-A2727P0-XX	700MHz	Class A	27dBm	XX=S1/S0/C0
RX08V3-A2727P0-XX	800MHz	Class A	27dBm	XX=S1/S0/C0
RX78V3-B3327P0-XX	700/800MHz	Class B	33dBm	XX=S1/S0/C0
RX07V3-B3327P0-XX	700MHz	Class B	33dBm	XX=S1/S0/C0
RX08V3-B3327P0-XX	800MHz	Class B	33dBm	XX=S1/S0/C0
RX78V3-B2727P0-XX	700/800MHz	Class B	27dBm	XX=S1/S0/C0

Remote Unit V3 NG

BDA Part Numbers	Band	Class	DL PWR	Duplexer Configuration
RH78V3-A3300P0-XX	700/800MHz	Class A	33dBm	XX=S1/S0/C0
RH07V3-A3300P0-XX	700MHz	Class A	33dBm	XX=S1/S0/C0
RH08V3-A3300P0-XX	800MHz	Class A	33dBm	XX=S1/S0/C0
RH78V3-A2700P0-XX	700/800MHz	Class A	27dBm	XX=S1/S0/C0
RH07V3-A2700P0-XX	700MHz	Class A	27dBm	XX=S1/S0/C0
RH08V3-A2700P0-XX	800MHz	Class A	27dBm	XX=S1/S0/C0
RH78V3-B3300P0-XX	700/800MHz	Class B	33dBm	XX=S1/S0/C0
RH07V3-B3300P0-XX	700MHz	Class B	33dBm	XX=S1/S0/C0
RH08V3-B3300P0-XX	800MHz	Class B	33dBm	XX=S1/S0/C0
RH78V3-B2700P0-XX	700/800MHz	Class B	27dBm	XX= S1 /S0/C0

FOU Part Numbers	Description
RHF0UV2F-E04UL	Critical Point Fiber Optical Unit for platform V2F and V3 NG, 4 port, UL 2524 Standard Certified
RHF0UV2F-E08UL	Critical Point Fiber Optical Unit for platform V2F and V3 NG, 8 port, UL 2524 Standard Certified

BBU Part Numbers	Battery Type	Capacity	Backup Hours
BBUV3-LFP48030	Lithium iron phosphate	30AH	>12H for 110W
BBUV3-LFP48060	Lithium iron phosphate	60AH	>24H for 110W, 12H for 220W
BBUV3-LFP48100	Lithium iron phosphate	100AH	>48H for 110W, 24H for 220W

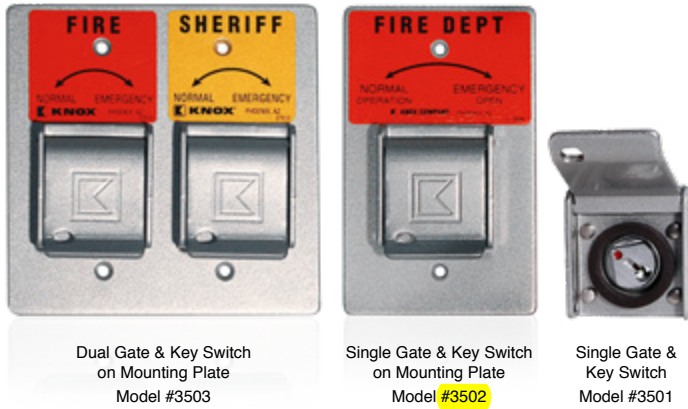
Master Unit V3 NG Licenses

License Part Numbers	Configuration	
RX78V3-L-2733AASS	27dBm to 33dBm upgrade license	27dBm to 33dBm upgrade license, for Single Band, Class A units
RX78V3-L-2733AADD		27dBm to 33dBm upgrade license, for Dual Band, Class A units
RX78V3-L-2733BBSS		27dBm to 33dBm upgrade license, for Single Band, Class B units
RX78V3-L-2733BBDD		27dBm to 33dBm upgrade license, for Dual Band, Class B units
RX78V3-L-3333AASD	Single Band to Dual Band upgrade license	Single band to Dual Band upgrade license, for 33dBm, Class A units
RX78V3-L-3333BBSD		Single band to Dual Band upgrade license, for 33dBm, Class B units
RX78V3-L-2727AASD		Single band to Dual Band upgrade license, for 27dBm, Class A units
Not Available		Single band to Dual Band upgrade license, for 27dBm, Class B units
RX78V3-L-3333BASS	Class B to Class A upgrade license	Class B to Class A upgrade license, for 33dBm, Single Band units
RX78V3-L-3333BADD		Class B to Class A upgrade license, for 33dBm, Dual Band units
RX78V3-L-2727BASS		Class B to Class A upgrade license, for 27dBm, Single Band units
RX78V3-L-2727BADD		Class B to Class A upgrade license, for 27dBm, Dual Band units

Remote Unit V3 NG Licenses

License Part Numbers	Configuration	
RH78V3-L-2733AASS	27dBm to 33dBm upgrade license	27dBm to 33dBm upgrade license, for Single Band, Class A units
RH78V3-L-2733AADD		27dBm to 33dBm upgrade license, for Dual Band, Class A units
RH78V3-L-2733BBSS		27dBm to 33dBm upgrade license, for Single Band, Class B units
RH78V3-L-2733BBDD		27dBm to 33dBm upgrade license, for Dual Band, Class B units
RH78V3-L-3333AASD	Single Band to Dual Band upgrade license	Single band to Dual Band upgrade license, for 33dBm, Class A units
RH78V3-L-3333BBSD		Single band to Dual Band upgrade license, for 33dBm, Class B units
RH78V3-L-2727AASD		Single band to Dual Band upgrade license, for 27dBm, Class A units
Not Available		Single band to Dual Band upgrade license, for 27dBm, Class B units
RH78V3-L-3333BASS	Class B to Class A upgrade license	Class B to Class A upgrade license, for 33dBm, Single Band units
RH78V3-L-3333BADD		Class B to Class A upgrade license, for 33dBm, Dual Band units
RH78V3-L-2727BASS		Class B to Class A upgrade license, for 27dBm, Single Band units
RH78V3-L-2727BADD		Class B to Class A upgrade license, for 27dBm, Dual Band units

Eliminate perimeter barriers that delay emergency response with the Knox Gate & Key Switch. Override electronic gates and lower voltage equipment to allow emergency access into communities, apartment complexes, parking garages, pedestrian gates, industrial receiving areas and much more.



FEATURES

- ✓ One position, two position or momentary switch
- ✓ Face plate and lock cover ensure weather resistant operation
- ✓ Dual locks enable shared access with other agencies

BENEFITS

- ✓ Gain rapid access through electronic gates without forced entry
- ✓ Overrides electronic gates, motorized doors, electrical switches
- ✓ Can share access with multiple agencies
- ✓ Utilizes Knox Master Key solution

OPTIONS

- ✓ Single or dual key switch
- ✓ Fire, EMS, security or law enforcement identification labels

ELECTRICAL DATA

- ✓ Switch: SPDT or DPDT
- ✓ 7 A resistive, 4 A inductive, (sea level), 28 VDC
- ✓ 7 A resistive, 2.5 A inductive, (50,000 ft.), 28 VDC
- ✓ 7 A resistive or inductive, 115 VAC, 60 Hz
- ✓ UL® and CSA listed: 7 A, 250 VAC
- ✓ Temperature tolerance up to +180° F

ORDERING SPECIFICATIONS

To insure procurement and delivery of the Knox Gate & Key Switch, it is suggested that the following specification paragraph be used:

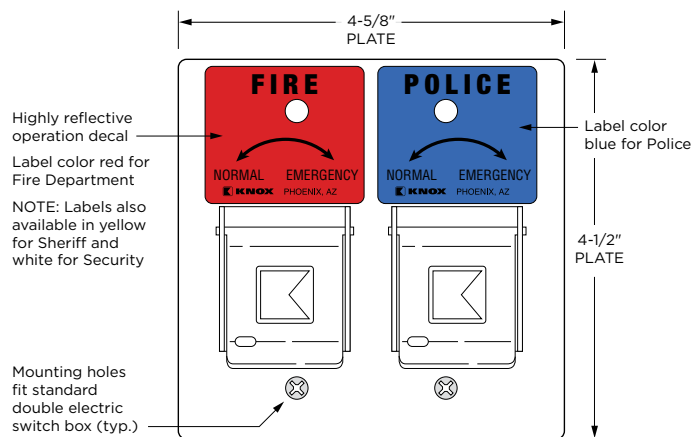
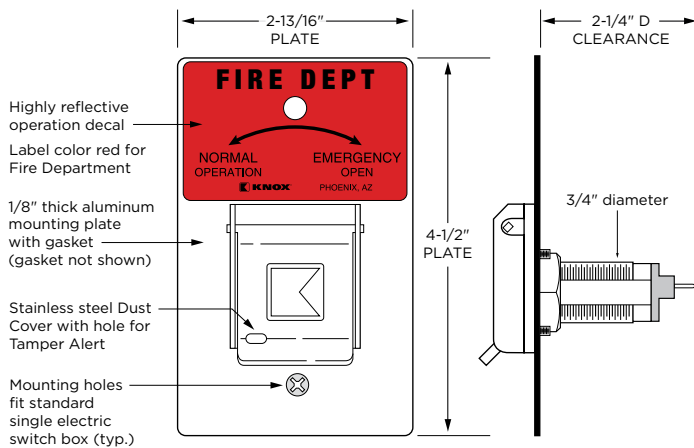
Dimensions: Requires 2 1/4" recessed depth x 3/4" diameter

Switch: SPDT or DPDT; 7 A resistive, 4 A inductive, key removable two position

Mounting: Key switch is designed to be recess mounted

P/N: 3500 Series Knox Gate & Key Switch (mfr's cat. ID)

Mfr's Name: KNOX COMPANY



ABOUT KNOX COMPANY

Over forty years ago, a unique concept in rapid access for emergency response was born. The KnoxBox®, a high-security key lock box, was designed to provide rapid access for emergency responders to reduce response times, minimize injuries and protect property from forced entry.

Today, one revolutionary lock box has grown into a complete system providing rapid access for public safety agencies, industries, military, and property owners across the world. The Knox Company is trusted by over 14,000 fire departments, law enforcement agencies, and governmental entities.

CriticalPoint™ Public Safety Annunciator Panel

CPAPV1

UL 2524 Standard Certified

Features

- Dedicated external Annunciator Panel for Comba Public Safety systems
Works with Comba V1/V2 Battery Backup Units and V3 BDA/Fiber BDA
- Can be powered directly from Comba Battery Backup Unit
- Long distance installation supported (based on RS485 standard)
- Provides visual and audio annunciation for UL 2524 standard alarms:
 - ✓ AC Input normal
 - ✓ Loss of normal AC power
 - ✓ Battery charger failure
 - ✓ Loss of battery capacity
 - ✓ Active RF emitting device malfunction
 - ✓ System component malfunction
 - ✓ Donor antenna disconnection
 - ✓ Donor antenna malfunction
- UL50E Type 4 enclosure
- Supports optional Dry Contact alarm outputs to FACP (Fire Alarm Control Panel)
- Operates on +12 ~ +60VDC
- Easy to install and commission
- **UL2524 2nd Edition Listing with SGS, Nationally Recognized Testing Laboratory (NRTL) approved by OSHA for UL2524 Standard Certified – SGS Certificate No.: SGSNA/21/GZ/00021**



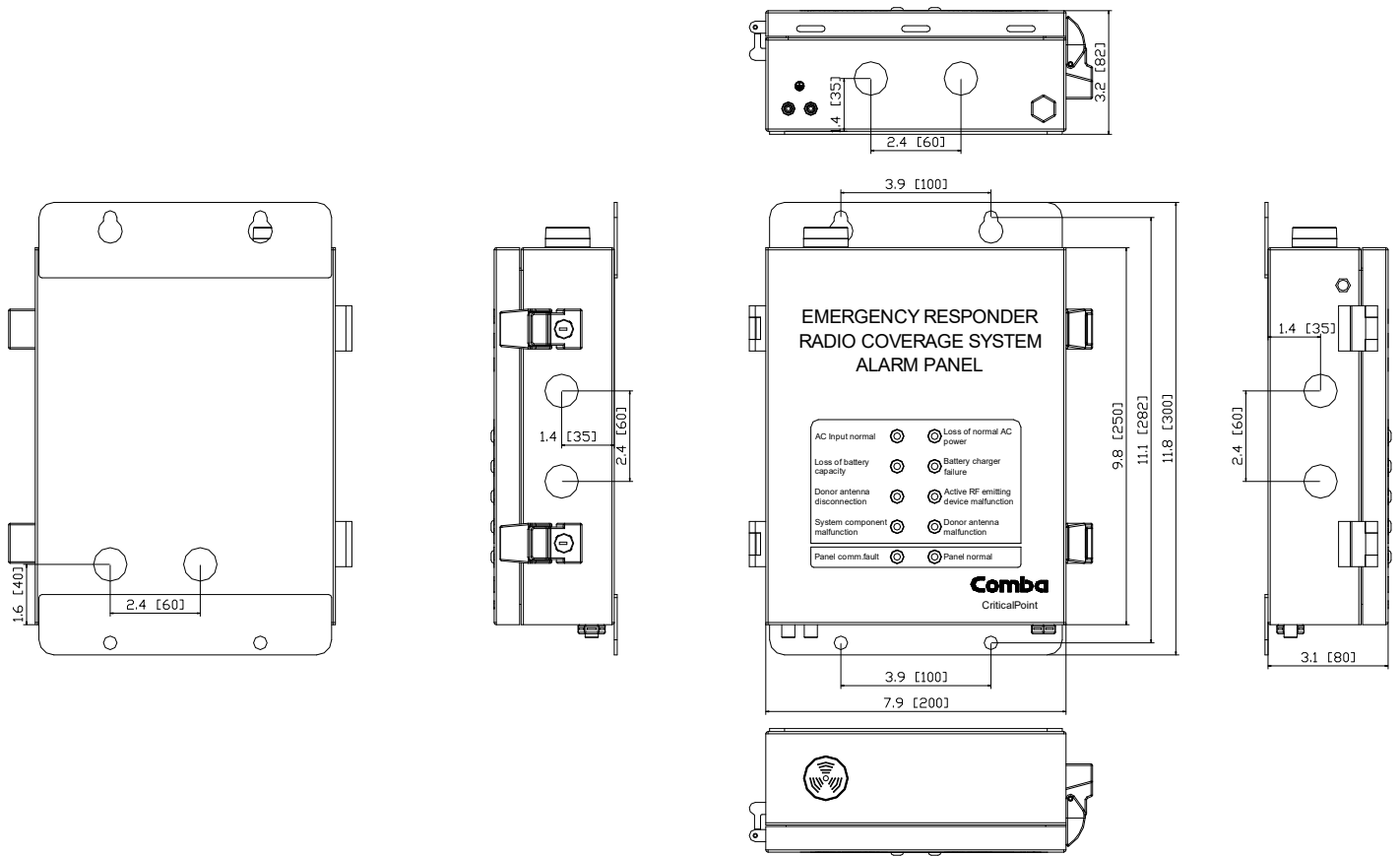
Specifications

Mechanical and Electrical		
Dimensions, H x W x D	In(mm)	11.8 x 7.9 x 4.4 (300 x 200 x 112)
Weight	lb(kg)	11 (5)
Power Supply	DC	+12 ~ +60VDC
Power Consumption	W	3
Mount Type		Wall Mount
Max Cable Distance, 24ga wire	Feet	2000
Max Cable Distance, 18ga wire	Feet	4000
Number of Conductors Required		5 (3 x RS485 Standard, 2 x DC Standard)
Number of Knockouts		8 (2 on bottom, 2 on back, 4 on sides)

Part Numbers

Part Number	Description
CPAPV1-DC-B-UL	Annunciator Panel, DC, Supports Dry Contact Alarm output, UL 2524 Standard Certified

Outline Drawing



Coaxial Cabling



AL4RPV-50, HELIAX® Plenum Rated Air Dielectric Coaxial Cable, corrugated aluminum, 1/2 in, Red PVC jacket

- This product is part of the CommScope Wired for Wireless® Solution

Product Classification

Brand	HELIAX®
Product Series	AL4-50
Product Type	Air coaxial cable

Construction Materials

Jacket Material	PVC
Dielectric Material	PE spline
Flexibility	Standard
Inner Conductor Material	Copper-clad aluminum wire
Jacket Color	Red
Outer Conductor Material	Corrugated aluminum

Dimensions

Nominal Size	1/2 in
Cable Weight	0.21 kg/m 0.14 lb/ft
Diameter Over Jacket	15.748 mm 0.620 in
Inner Conductor OD	4.5720 mm 0.1800 in
Outer Conductor OD	14.046 mm 0.553 in

Electrical Specifications

Cable Impedance	50 ohm ±2 ohm
Capacitance	76.0 pF/m 23.0 pF/ft
dc Resistance, Inner Conductor	1.570 ohms/km 0.480 ohms/kft
dc Resistance, Outer Conductor	1.570 ohms/km 0.480 ohms/kft
dc Test Voltage	4000 V
Inductance	0.190 µH/m 0.058 µH/ft
Insulation Resistance	100000 Mohms•km
Jacket Spark Test Voltage (rms)	5000 V
Operating Frequency Band	1 – 6000 MHz
Peak Power	40.0 kW
Power Attenuation	2.325
Pulse Reflection	0.5%
Velocity	88%

Environmental Specifications

Installation Temperature	-5 °C to +60 °C (+23 °F to +140 °F)
Operating Temperature	-20 °C to +85 °C (-4 °F to +185 °F)
Storage Temperature	-20 °C to +85 °C (-4 °F to +185 °F)

General Specifications

Ordering Note	CommScope® standard product (Global)
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Mechanical Specifications

Bending Moment	6.8 N-m 5.0 ft lb
Fire Retardancy Test Method	NFPA 262/CATVP/CMP
Flat Plate Crush Strength	1.4 kg/mm 80.0 lb/in
Minimum Bend Radius, Multiple Bends	127.00 mm 5.00 in
Minimum Bend Radius, Single Bend	64.00 mm 2.50 in
Number of Bends, minimum	15
Tensile Strength	79 kg 175 lb

Note

Performance Note	Values typical, unless otherwise stated
-------------------------	---

Standard Conditions

Attenuation, Ambient Temperature	20 °C 68 °F
Average Power, Ambient Temperature	40 °C 104 °F
Average Power, Inner Conductor Temperature	100 °C 212 °F

Return Loss/VSWR

Frequency Band	VSWR	Return Loss (dB)
700–894 MHz	1.13	24.30
806–960 MHz	1.13	24.30
1700–2200 MHz	1.13	24.30

Attenuation

Frequency (MHz)	Attenuation (dB/100 m)	Attenuation (dB/100 ft)	Average Power (kW)
0.5	0.152	0.046	40.00
1	0.216	0.066	35.37
1.5	0.264	0.081	28.84
2	0.306	0.093	24.95
10	0.691	0.211	11.04
20	0.985	0.3	7.75
30	1.213	0.37	6.29
50	1.581	0.482	4.83
85	2.087	0.636	3.66
88	2.126	0.648	3.59
100	2.274	0.693	3.35
108	2.368	0.722	3.22
150	2.821	0.86	2.70
174	3.054	0.931	2.50
200	3.292	1.003	2.32
204	3.327	1.014	2.29
300	4.104	1.251	1.86
400	4.808	1.466	1.59
450	5.134	1.565	1.49
500	5.445	1.659	1.40
512	5.517	1.682	1.38
600	6.032	1.839	1.26
700	6.583	2.007	1.16
800	7.105	2.166	1.07
824	7.227	2.203	1.06
894	7.574	2.308	1.01
960	7.892	2.405	0.97
1000	8.081	2.463	0.94
1218	9.068	2.764	0.84
1250	9.207	2.806	0.83
1500	10.256	3.126	0.74
1700	11.053	3.369	0.69
1794	11.416	3.48	0.67
1800	11.439	3.487	0.67
2000	12.192	3.716	0.63
2100	12.559	3.828	0.61
2200	12.92	3.938	0.59
2300	13.276	4.046	0.57
2500	13.975	4.259	0.55
2700	14.656	4.467	0.52
3000	15.649	4.77	0.49
3400	16.928	5.159	0.45
3700	17.859	5.443	0.43
4000	18.768	5.72	0.41
5000	21.671	6.605	0.35

6000 24.42 7.443 0.31

** Values typical, guaranteed within 5%*

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system
ETL Certification	CATVP/CMP
c(ETL)us Certification	CATVP/CMP



Heavy duty, Non-Metallic QuickLATCH™

Made in USA 

NEW!
more on reverse

Installed Strut Clip • For RIGID and EMT



Fast, Easy Installation!
Saves 20 seconds per installation

Arlington's heavy duty NM3100 series QuickLATCH™ with *installed strut clip* holds RIGID and EMT securely on strut. Use it like a pipe hanger.



NM3100
1/2" EMT

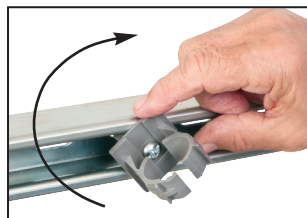
Stainless steel screw

One-piece QuickLATCH saves time, about 20 seconds per installation... over 33¢ each at \$60.00 per hour labor rate.

Fast and easy to install. Insert the hanger into the strut, twist to lock the pre-installed clip in place then tighten screw to secure QuickLATCH to strut. Push RIGID or EMT into the hanger to lock it in place.



1 Insert QuickLATCH into strut. The strut clip is already attached so you save time.



2 Twist QuickLATCH to seat clip in strut.



3 Tighten screw for secure installation on strut.



4 Push conduit into QuickLATCH to snap in place.



5 Secure installation of conduit to strut.



Easy screwdriver removal

- UV rated, corrosion resistant for outdoor use
- Stainless steel screw
- Mounts vertically or horizontally
- Screwdriver removal, reusable
- Listed for use in environmental air handling spaces per 2020 NEC, article 300.22(c)

See reverse for even more QuickLATCH products!

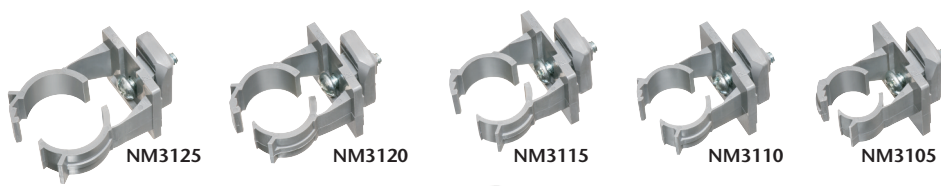
Patent pending



Arlington®

1 Stauffer Industrial Park
Scranton, PA 18517

800/233.4717 • Fax 570/562.0646
www.aifittings.com

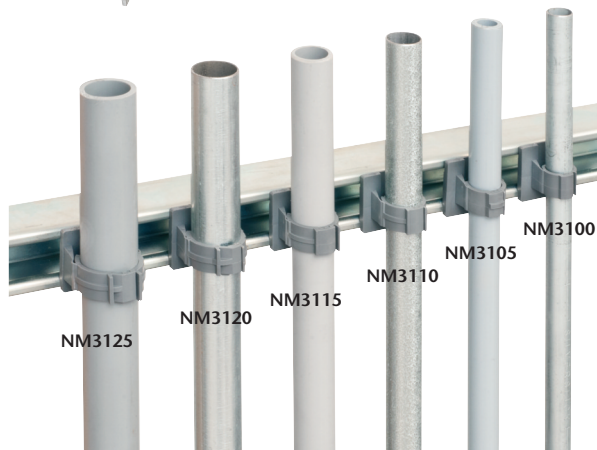


QUICKLATCH™ PIPE HANGER

CATALOG NUMBER	UPC/DEI/NAED MFG. #018997	RIGID, IMC PVC SIZE	EMT SIZE	STD PKG
NM3100	54027	---	1/2"	100
NM3105	54028	1/2"	---	100
NM3110	54029	---	3/4"	100
NM3115	54030	3/4"	--	100
NM3120	54031	---	1"	100
NM3125	54032	1"	---	100

Includes 1/4"-20 stainless steel screw and strut clip (installed)

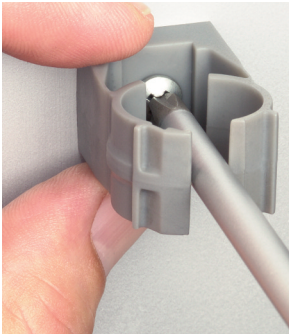
NM3100 series 0120/15M © 2020 Arlington Industries, Inc.



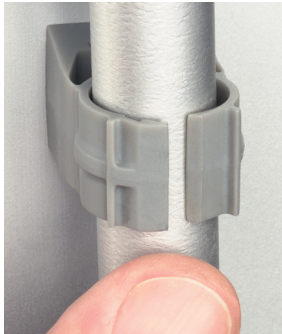
UV Rated • Non-metallic QuickLATCH™

Made in USA 

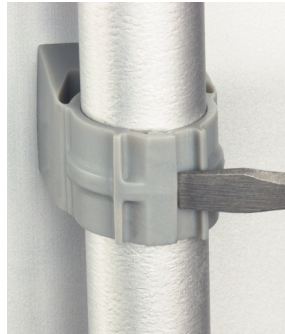
Works just like a Pipe Hanger • Easy to Install



Mount to surface with a screw.



Press down on pipe to lock it firmly in place.



Removable Use screwdriver to lift tab.

Fast and easy to install, one-piece, non-metallic **QuickLATCH™** mounts to walls, metal strut and studs, and threaded rod up to 1/4-20...works with Arlington's Strut Clip™ too. *Strut Clip holds pipe hangers securely on strut.*

It fits 1/2" to 4" EMT, RIGID, IMC and PVC. The larger 2-1/2" to 4" sizes have an extra opening for the optional securing of tie wire or cable tie.

- Corrosion resistant
- Horizontal or vertical mounting
- Integral slot keeps nut from spinning

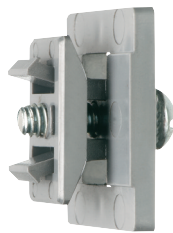
Catalog Number	UPC/DEI/NAED Mfg. #018997	RIGID, IMC PVC sizes	EMT size	LT size	Flex size	ENT size	Copper Tubing	Copper Pipe	Std Pkg
NM1900	54514	---	---	5/16	---	---	1/2	---	100
NM2000	54515	---	1/2	3/8	---	---	---	3/8	100
NM2005	54525	1/2	---	1/2	1/2	1/2	---	1/2	100
NM2010	54516	---	3/4	---	---	---	3/4	---	100
NM2015	54526	3/4	---	3/4	3/4	3/4	---	3/4	100
NM2020	54517	---	1	---	---	---	1	---	100
NM2025	54518	1	---	1	1	1	---	1	100
NM2030	54528	---	1-1/4	---	---	---	1-1/4	---	100
NM2040	54519	1-1/4	1-1/2	---	---	---	1-1/2	1-1/4	100
NM2045	54544	1-1/2	---	1-1/2	1-1/2	---	---	1-1/2	100
NM2150	54547	---	---	---	---	---	2	---	50
NM2050	54520	2	2	2	2	---	2	---	50
NM2060	54521	2-1/2	2-1/2	2-1/2	2-1/2	---	---	---	50
NM2070	54522	3	3	3	3	---	---	---	25
NM2080	54523	3-1/2	3-1/2	3-1/2	3-1/2	---	---	---	25
NM2090	54524	4	4	4	4	---	---	---	10



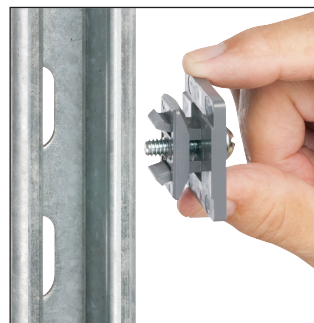
2-1/2" to 4"
Press pipe into QuickLATCH, up to the first notch to lock it in place. Then squeeze tabs together for a super-secure hold.



Catalog Number	UPC/DEI/NAED Mfg. #018997	Description	Unit/Std Pkg
NM1000	54615	UV rated, non-metallic clip Holds pipe hangers and/or conduit secure on strut Includes 1/4"-20 screw (installed)	100



NM1000
STRUT CLIP
Strut Conduit Support



Our QuickLATCH™ Pipe Hanger installs on Strut Clip™



Distributed by

Arlington®

1 Stauffer Industrial Park
Scranton, PA 18517
800/233.4717 • Fax 570/562.0646
www.aifittings.com



L4TNM-PSA

Type N Male Positive Stop™ for 1/2 in AL4RPV-50, LDF4-50A, HL4RPV-50 cable

- This product is part of the CommScope Wired for Wireless® Solution

Product Classification

Brand	HELIAX® Positive Stop™
Product Type	Wireless and radiating connector

General Specifications

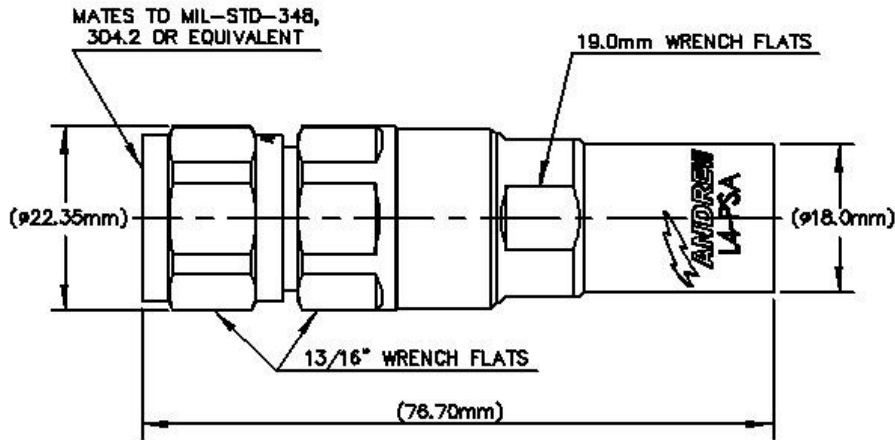
Interface	N Male
Body Style	Straight
Brand	HELIAX® Positive Stop™
Harmonized System (HS) Code	854420 (Coaxial cable and other coaxial electric conductors)
Mounting Angle	Straight
Ordering Note	CommScope® standard product (Global)

Electrical Specifications

Connector Impedance	50 ohm
Operating Frequency Band	0 – 8800 MHz
Cable Impedance	50 ohm
3rd Order IMD, typical	-116 dBm @ 910 MHz
3rd Order IMD Test Method	Two +43 dBm carriers
RF Operating Voltage, maximum (vrms)	707.00 V
dc Test Voltage	2000 V
Outer Contact Resistance, maximum	0.30 mOhm
Inner Contact Resistance, maximum	2.00 mOhm
Insulation Resistance, minimum	5000 MOhm
Average Power	0.6 kW @ 900 MHz
Peak Power, maximum	10.00 kW
Insertion Loss, typical	0.05 dB
Shielding Effectiveness	-130 dB

L4TNM-PSA

Outline Drawing



Mechanical Specifications

Outer Contact Attachment Method	Ring-flare
Inner Contact Attachment Method	Captivated
Outer Contact Plating	Trimetal
Inner Contact Plating	Silver
Attachment Durability	25 cycles
Interface Durability	500 cycles
Interface Durability Method	IEC 61169-16:9.5
Connector Retention Tensile Force	890 N 200 lbf
Connector Retention Torque	5.42 N-m 48.00 in lb
Insertion Force	66.72 N 15.00 lbf
Insertion Force Method	MIL-C-39012C-3.12, 4.6.9
Coupling Nut Proof Torque	4.52 N-m 40.00 in lb
Coupling Nut Retention Force	444.82 N 100.00 lbf
Coupling Nut Retention Force Method	MIL-C-39012C-3.25, 4.6.22

Dimensions

Nominal Size	1/2 in
Diameter	22.35 mm 0.88 in
Length	76.70 mm 3.02 in
Weight	94.71 g 0.21 lb

Environmental Specifications

Operating Temperature	-55 °C to +85 °C (-67 °F to +185 °F)
Storage Temperature	-55 °C to +85 °C (-67 °F to +185 °F)
Immersion Depth	1 m

L4TNM-PSA

Immersion Test Mating	Unmated
Immersion Test Method	IEC 60529:2001, IP68
Water Jetting Test Mating	Unmated
Water Jetting Test Method	IEC 60529:2001, IP66
Moisture Resistance Test Method	MIL-STD-202F, Method 106F
Mechanical Shock Test Method	MIL-STD-202, Method 213, Test Condition I
Thermal Shock Test Method	MIL-STD-202F, Method 107G, Test Condition A-1, Low Temperature -55 °C
Vibration Test Method	IEC 60068-2-6
Corrosion Test Method	MIL-STD-1344A, Method 1001.1, Test Condition A

Return Loss/VSWR

Frequency Band	VSWR	Return Loss (dB)
45–1000 MHz	1.02	39.00
1010–2200 MHz	1.03	37.00
2210–3000 MHz	1.05	33.00
3010–4000 MHz	1.09	27.00
4010–6000 MHz	1.25	19.00
6010–8000 MHz	1.33	17.00

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system



* Footnotes

Immersion Depth	Immersion at specified depth for 24 hours
Insertion Loss, typical	$0.05\sqrt{\text{freq}}$ (GHz) (not applicable for elliptical waveguide)

L4TNF-PSA



Type N Female Positive Stop™ for 1/2 in AL4RPV-50, LDF4-50A, HL4RPV-50 cable

Product Classification

Product Type	Wireless and radiating connector
Product Brand	HELIAX® Positive Stop™
Ordering Note	CommScope® standard product (Global)

General Specifications

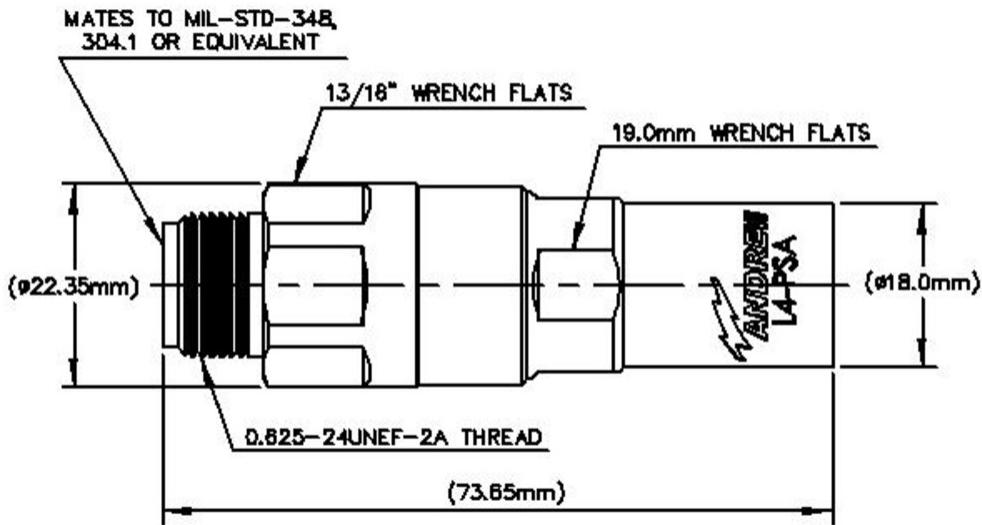
Body Style	Straight
Cable Family	AL4-50
Harmonized System (HS) Code	854420 (Coaxial cable and other coaxial electric conductors)
Inner Contact Attachment Method	Captivated
Inner Contact Plating	Silver
Interface	N Female
Mounting Angle	Straight
Outer Contact Attachment Method	Ring-flare
Outer Contact Plating	Trimetal

Dimensions

Length	73.66 mm 2.9 in
Diameter	22.35 mm 0.88 in
Nominal Size	1/2 in

Outline Drawing

L4TNF-PSA



Electrical Specifications

3rd Order IMD at Frequency	-116 dBm @ 910 MHz
3rd Order IMD Test Method	Two +43 dBm carriers
Insertion Loss, typical	0.05 dB
Average Power at Frequency	0.6 kW @ 900 MHz
Cable Impedance	50 ohm
Connector Impedance	50 ohm
dc Test Voltage	2000 V
Inner Contact Resistance, maximum	2 mOhm
Insulation Resistance, minimum	5000 MOhm
Operating Frequency Band	0 – 8800 MHz
Outer Contact Resistance, maximum	0.3 mOhm
Peak Power, maximum	10 kW
RF Operating Voltage, maximum (vrms)	707 V
Shielding Effectiveness	-130 dB

VSWR/Return Loss

Frequency Band	VSWR	Return Loss (dB)
50–1000 MHz	1.03	39

L4TNF-PSA

1010–2200 MHz	1.03	37
2210–3000 MHz	1.05	33
3010–4000 MHz	1.08	29
4010–6000 MHz	1.12	25

Mechanical Specifications

Attachment Durability	25 cycles
Connector Retention Tensile Force	889.64 N 200 lbf
Connector Retention Torque	5.42 N-m 47.998 in lb
Insertion Force	66.72 N 15 lbf
Insertion Force Method	MIL-C-39012C-3.12, 4.6.9
Interface Durability	500 cycles
Interface Durability Method	IEC 61169-16:9.5
Mechanical Shock Test Method	MIL-STD-202, Method 213, Test Condition I

Environmental Specifications

Operating Temperature	-55 °C to +85 °C (-67 °F to +185 °F)
Storage Temperature	-55 °C to +85 °C (-67 °F to +185 °F)
Corrosion Test Method	MIL-STD-1344A, Method 1001.1, Test Condition A
Immersion Depth	1 m
Immersion Test Mating	Unmated
Immersion Test Method	IEC 60529:2001, IP68
Moisture Resistance Test Method	MIL-STD-202F, Method 106F
Thermal Shock Test Method	MIL-STD-202F, Method 107G, Test Condition A-1, Low Temperature -55 °C
Vibration Test Method	IEC 60068-2-6
Water Jetting Test Mating	Unmated
Water Jetting Test Method	IEC 60529:2001, IP66

Packaging and Weights

Weight, net	88.46 g 0.195 lb
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Regulatory Compliance/Certifications

Agency	Classification
CHINA-ROHS	Above maximum concentration value

L4TNF-PSA

ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
REACH-SVHC	Compliant as per SVHC revision on www.commscope.com/ProductCompliance
ROHS	Compliant/Exempted



* Footnotes

Insertion Loss, typical	0.05v̄freq (GHz) (not applicable for elliptical waveguide)
Immersion Depth	Immersion at specified depth for 24 hours



L4NR-PS

Type N Male Right Angle Positive Stop™ for 1/2 in LDF4-50A cable

Product Classification

Brand	HELIAX® Positive Stop™
Product Type	Wireless and radiating connector

General Specifications

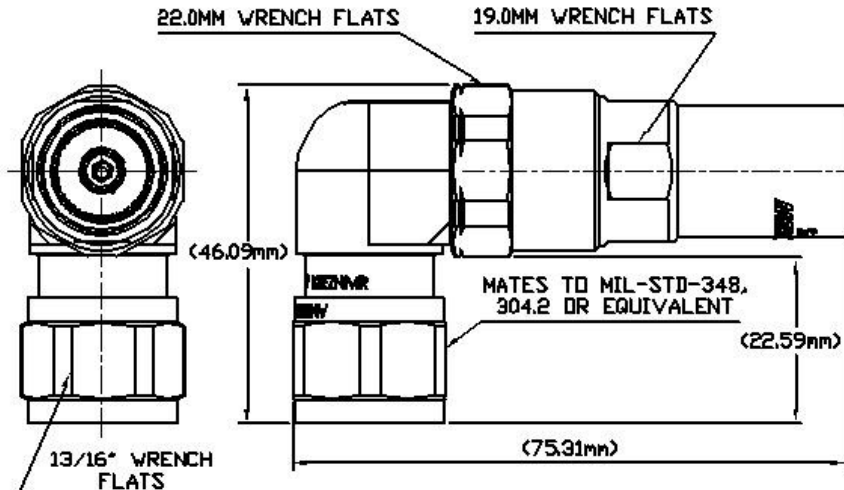
Interface	N Male
Body Style	Right angle
Brand	HELIAX® Positive Stop™
Mounting Angle	Right angle
Ordering Note	CommScope® standard product (Global)

Electrical Specifications

Connector Impedance	50 ohm
Operating Frequency Band	0 – 8800 MHz
Cable Impedance	50 ohm
3rd Order IMD, typical	-116 dBm @ 910 MHz
3rd Order IMD Test Method	Two +43 dBm carriers
RF Operating Voltage, maximum (vrms)	707.00 V
dc Test Voltage	2000 V
Outer Contact Resistance, maximum	0.30 mOhm
Inner Contact Resistance, maximum	2.00 mOhm
Insulation Resistance, minimum	5000 MOhm
Average Power	0.6 kW @ 900 MHz
Peak Power, maximum	10.00 kW
Insertion Loss, typical	0.05 dB
Shielding Effectiveness	-110 dB

L4NR-PS

Outline Drawing



Mechanical Specifications

Outer Contact Attachment Method	Self-flare
Inner Contact Attachment Method	Captivated
Outer Contact Plating	Trimetal
Inner Contact Plating	Gold Silver
Interface Durability	500 cycles
Interface Durability Method	IEC 61169-4:9.5
Connector Retention Tensile Force	890 N 200 lbf
Connector Retention Torque	5.42 N-m 48.00 in lb
Pressurizable	No
Coupling Nut Proof Torque	4.52 N-m 40.00 in lb
Coupling Nut Retention Force	444.82 N 100.00 lbf
Coupling Nut Retention Force Method	MIL-C-39012C-3.23, 4.6.22

Dimensions

Nominal Size	1/2 in
Height	46.09 mm 1.81 in
Length	75.31 mm 2.96 in
Right Angle Length	22.60 mm 0.89 in
Weight	133.10 g 0.29 lb
Width	23.50 mm 0.93 in

Environmental Specifications

Operating Temperature	-55 °C to +85 °C (-67 °F to +185 °F)
Storage Temperature	-55 °C to +85 °C (-67 °F to +185 °F)
Immersion Depth	1 m

L4NR-PS

Immersion Test Mating	Unmated
Immersion Test Method	IEC 60529:2001, IP68
Water Jetting Test Mating	Unmated
Water Jetting Test Method	IEC 60529:2001, IP66
Moisture Resistance Test Method	MIL-STD-202F, Method 106F
Mechanical Shock Test Method	MIL-STD-202F, Method 213B, Test Condition C
Thermal Shock Test Method	MIL-STD-202F, Method 107G, Test Condition A-1, Low Temperature -55 °C
Vibration Test Method	MIL-STD-202F, Method 204D, Test Condition B
Corrosion Test Method	MIL-STD-1344A, Method 1001.1, Test Condition A

Standard Conditions

Attenuation, Ambient Temperature	20 °C 68 °F
Average Power, Ambient Temperature	40 °C 104 °F

Return Loss/VSWR

Frequency Band	VSWR	Return Loss (dB)
50–1000 MHz	1.02	-39.00
1000–1900 MHz	1.04	-34.00
1900–2200 MHz	1.05	-32.00
2200–2700 MHz	1.08	-28.00
2700–3600 MHz	1.10	-26.00
3600–6000 MHz	1.12	-25.00
6000–8800 MHz	1.29	-18.00

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system



* Footnotes

Immersion Depth	Immersion at specified depth for 24 hours
Insertion Loss, typical	0.05v̄ freq (GHz) (not applicable for elliptical waveguide)

Passive Distribution Components

Wideband Directional Coupler

DC-Rxx-ON300C(XH)

Low PIM(-153dBc), 698-2700MHz, N-Female, 300W

- Wideband design covering 698-2700MHz
- Available 5, 6, 7, 8, 10, 13, 15, 20, 30 & 40dB values
- Suitable for indoor/outdoor environment
- High Reliability and Low Insertion Loss



Electrical Specification

Product Model	DC-R05-ON300C (XH)	DC-R06-ON300C (XH)	DC-R07-ON300C (XH)	DC-R08-ON300C (XH)	DC-R10-ON300C (XH)	DC-R13-ON300C (XH)	DC-R15-ON300C (XH)	DC-R20-ON300C (XH)	DC-R30-ON300C (XH)	DC-R40-ON300C (XH)
Frequency (MHz)	698-2700									
Coupling (dB)	5.0	6.0	7.0	8.0	10.0	13.0	15.0	20.0	30.0	40.0
Coupling Tolerance (dB)	± 0.8	± 0.8	± 0.8	± 0.8	± 0.8	± 1.0	± 1.0	± 1.2	± 1.5	± 1.5
Loss (dB)	≤ 2.1	≤ 1.7	≤ 1.4	≤ 1.2	≤ 0.7	≤ 0.5	≤ 0.4	≤ 0.3	≤ 0.2	≤ 0.2
Isolation (dB)	≥ 25	≥ 26	≥ 27	≥ 28	≥ 30	≥ 33	≥ 35	≥ 40	≥ 45	≥ 55
VSWR @ Input port	≤ 1.25									
PIM (dBc)	<-153 @ 2 x 43dBm									
Average Power, max (W)	300									
Peak Power, max (W)	1000									
Impedance (ohm)	50									

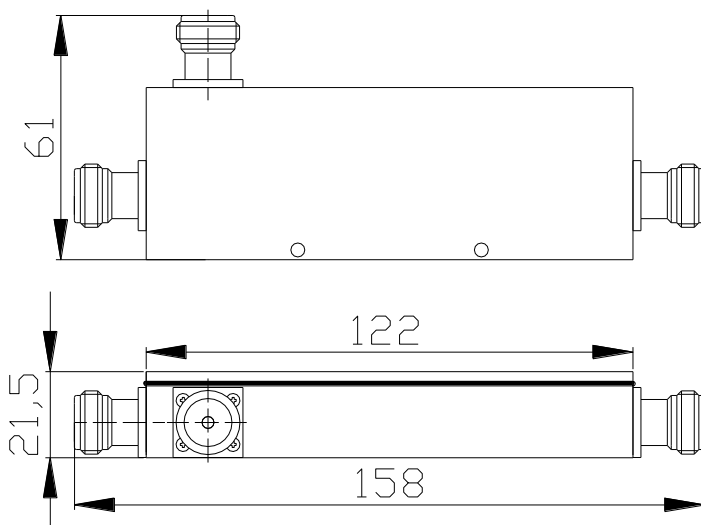
Mechanical Specification

Dimension (in/mm)	6.2x2.4x0.8 / 158x61x21.5
Weight (lb/kg)	0.75 / 0.34
Connector	N-Female

Environment & Compliance

Application	Outdoor / Indoor
Operating Temperature	-40°C to +80°C
Environment	IP65
Relative Humidity	Up to 95%
RoHS	Compliant

Outline Drawing



Indoor Omni Antenna Ceiling Mounted

IX-MJN-V3U

Low PIM(-153dBc), 698-2700MHz, N-Female

- Wideband design covering 698-2700MHz
- Suitable for indoor application
- Compact and cost-effective design
- Supporting flammability UL-94-V0 rating



Electrical Specification

Product Model	IX-MJN-V3U		
Frequency (MHz)	698-806	806-960	1695-2700
Gain (dBi)	1.8 ± 0.5	2.0 ± 0.5	3.0 ± 1.0
Polarization	Vertical		
Beamwidth Horizontal (°)	360		
Beamwidth Vertical(°)	90	70	35
VSWR	≤ 1.8. typical ≤ 1.5	≤ 1.5	≤ 1.5
PIM (dBc)	< -153 @ 2 x 43dBm		
Average Power, max (W)	50		
Impedance (ohm)	50		

Mechanical Specification

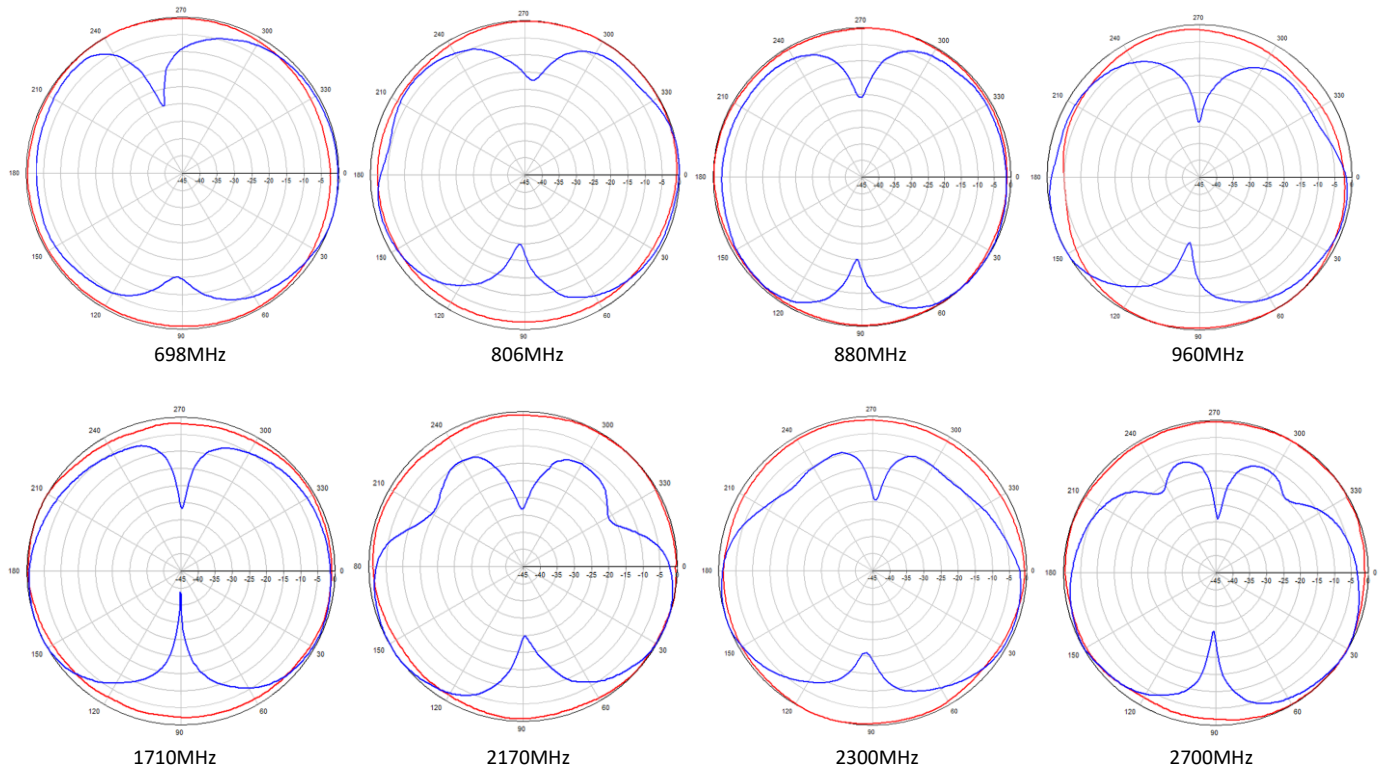
Dimension Diameter, height (in/mm)	Ø 8.0 x 4.5 / Ø 204.0x 115.0
Weight (lb./kg)	1.10 / 0.40
Shipping Dimension(in/mm)	7.09x7.09x7.09 / 180.0x180.0x180.0
Shipping Weight(lb./kg)	1.46 / 0.66
Radome Material & color	ABS, White, RAL9003
Flammability	UL-94-V0
Mounting/Connector type	Ceiling Mount, N-female Option1: Hard Ceiling mount bracket (MT-DA-01) Option2: High Ceiling or Joist mount bracket (MT-ND-HC)

Environment & Compliance

Application	Indoor
Operating Temperature	-40°C to +70°C
Relative Humidity	Up to 95%
RoHS	Compliant
Environment	

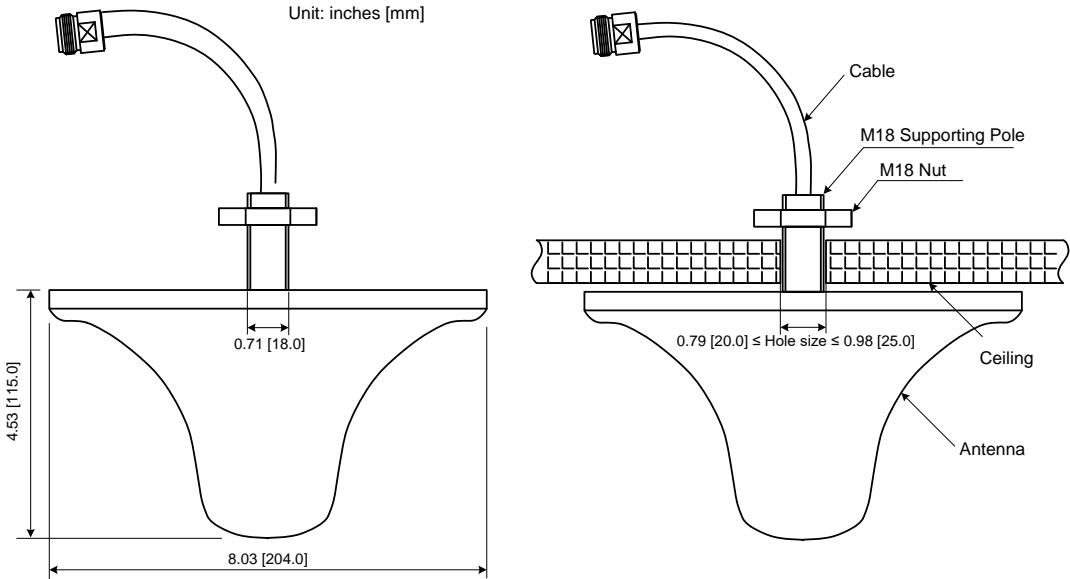
Antenna Pattern

— Horizontal — Vertical

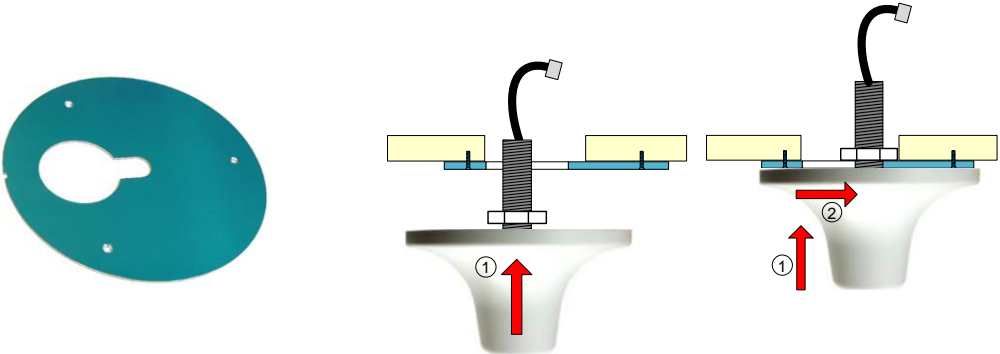


Outline Drawing & Installation Instruction

1. Standard Ceiling Mounting



2. Hard Ceiling Mounting
Mounting Bracket: MT-DA-01. Please refer MT-DA-01 Installation instruction



3. High Ceiling Mounting / Joist Mounting
Mounting Bracket: MT-ND-HC. Please refer MT-ND-HC Installation instruction

