



FibeAir[®] RFU-C

**Innovative
Radio System**



Product Description

Version 9.0

March 2011



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Introduction

This document describes the new and innovative FibeAir RFU-C.

RFU-C is a state-of-the-art Radio Frequency Unit which is fully software configurable and supports a broad range of capacities and interfaces.

The RFU supports low to high capacities for traditional voice and Ethernet services, as well as SDH/SONET or hybrid Ethernet and TDM interfaces.

This innovative platform uses an “on-the-fly” upgrade method, whereby network operators only buy capacity as needed, benefiting from savings on initial investments and OPEX.

Traffic capacity throughput and spectral efficiency are optimized with the desired channel bandwidth. For maximum user choice flexibility, channel bandwidths can be selected together with a range of modulations of from QPSK to 256 QAM.

High spectral efficiency is ensured using the same bandwidth for double the capacity, via two carriers, with vertical and horizontal polarizations. This feature is implemented by a built-in XPIC mechanism.

RFU-C works together with two types of indoor units. For SDH/SONET, the RFU works with the FibeAir 1500R indoor unit. For Ethernet and PDH traffic, RFU-C works with the FibeAir IP-10 indoor unit.

Together, FibeAir RFU-C and FibeAir 1500R/IP-10 IDUs provide a powerful, reliable, and comprehensive solution for a variety of wireless network scenarios and requirements.

RFU-C operating in co-channel dual polarization (CCDP) mode, using the cross polarization interference canceller (XPIC) algorithm, two carriers signals can be transmitted over a single channel, using vertical and horizontal polarization. This enables double capacity in the same spectrum bandwidth.



FibeAir RFU-C

Works with



FibeAir 1500R



FibeAir IP-10



Product Overview

Ceragon's FibeAir RFU-C is based on Ceragon's latest RFU technology.

As part of the FibeAir family, RFU-C supports multiple capacities, frequencies, modulation schemes, and configurations for various network requirements.

RFU-C operates in the frequency range of 6-38 GHz, and supports capacities of 10 Mbps to 500 Mbps, for PDH, Ethernet, and SDH/SONET traffic.

The capacity can easily be doubled using a Cross Polarization Interference Canceller (XPIC) algorithm. For example, using XPIC, two STM-1/OC-3 signals can be transmitted over a single 28 MHz channel, with both vertical and horizontal polarization. This enables double capacity in the same spectrum bandwidth.

References & Standards

[1] EN 302 217-4-2 V1.2.1 (2006-08) "Fixed Radio Systems; Characteristics and requirements for point-to-point equipment and antennas; Part 2-2: Harmonized EN covering essential requirements of Article 3.2 of R&TTE Directive for digital systems operating in frequency bands where frequency co-ordination is applied.

[2] EN 302 217-2-1 V1.1.2 (2004-09).

[3] EN 300 234: "Transmission and Multiplexing (TM); Digital Radio Relay Systems (DRRS); High capacity DRRS carrying 1xSTM-1 / OC-3 signals and operating in frequency bands with about 30 MHz channel spacing and alternated arrangements".

[4] EN 300 385: "Electromagnetic compatibility and Radio spectrum Matters (ERM); Electro Magnetic Compatibility (EMC) standard for fixed radio links and ancillary equipment".

[5] ETS 300 019: "Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment".

[6] ETS 300 132-2: "Equipment Engineering (EE); Power supply interface at the input to telecommunications equipment; Part 2: Operated by direct current (dc)".

[7] ITU-R Recommendation F.1191: "Bandwidths and unwanted emissions of digital radio-relay systems".

[8] ITU-R Rec. F.383-6: "Radio-frequency channel arrangements for high capacity radio-relay systems operating in the lower 6 GHz band.

[9] ITU-R Rec. F.384-7: " Radio-frequency channel arrangements for medium and high capacity analogue or digital radio-relay systems operating in the upper 6H GHz band [8] FCC 101.147 [7] " Radio-frequency channel arrangements for radio-relay systems operating in upper 6H GHz band

[10] ITU-R Rec. F.385-6: " Radio-frequency channel arrangements for radio-relay systems operating in the 7 GHz band

[11] ITU-R Rec. F.386-6: " Radio-frequency channel arrangements for medium and high capacity analogue or digital radio-relay systems operating in the 8 GHz band

[12] ITU-T Recommendation G.703 (1991): "Physical/electrical characteristics of hierarchical digital interfaces".

[13] ITU-T Recommendation G.707 (1996): "Network node interface for the synchronous digital hierarchy (SDH/SONET)".

[14] CEPT/ERC 14-01E " Radio-frequency channel arrangements for radio-relay systems operating in the 6L GHz band.



Main Features

- Operates in the frequency range of 6-38 GHz
- Configurable capacities, from 10 Mbps to 500 Mbps
- Configurable modulations: QPSK, 8, 16, 32, 64, 128, 256 QAM
- Configurable channel bandwidths: 7,10, 14, 20, 25, 28, 29.65, 29, 30, 40 ,50, 56 MHz
- Supports PDH, SDH/SONET, and Ethernet interfaces
- Supports ACM (Adaptive Code Modulation) for QPSK to 256 QAM modulation
- Innovative advanced technology
- Direct or remote antenna mount for all frequencies
- Direct and remote mount installation using the same antenna type
- Main configurations: 1+1, 1+0, 2+0, 2+2
- Built-in XPIC (Cross Polarization Interference Canceller) and Co-Channel Dual Polarized (CCDP)
- Easy frequency sub-band replacement
- Low power consumption
- Compliant with ETSI, FCC, ITU-T, and ITU-R standards and frequency plans, for worldwide operation
- Small, compact, and light
- Fast and simple installation



Applications

Together with the FibeAir Indoors, FibeAir RFU-C can be used for a variety of applications, as a flexible and cost-effective long haul solution.

The following are examples of applications for which FibeAir RFU-C is optimally suited.

Mobile and Fixed Infrastructure

RFU-C is a beneficial solution for the expansion of mobile cellular networks that require high capacity due to an increase in subscribers, cell sites, and data rich applications. It offers smooth migration from existing PDH to SONET/SDH network functionality, and to next generation IP/ATM, using different capacities of from 10 to 500 Mbps.

With its reliable fiber-like transmission/receiving quality and protection capabilities, FibeAir RFU-C is a dependable telecommunications solution for different network topologies, such as ring, mesh, chained, and star, which require both accuracy and stability.

Backhaul for DSL Triple Play Networks

With the highest available throughput on the market, Ceragon provides operators with wireless GBE connectivity of IP-DSLAMs for economical intruction of triple play services including VoIP, Internet services, and IPTV/HDTV over DSL. IP-DSLAM connectivity via wireless links is essential where there is no fiber reach, or as a cost-effective alternative to leased lines.

WiMAX Infrastructure Backhauling

Provides a robust and cost-effective alternative to expensive leased lines, for connectivity between WiMAX base stations expanding network reach.

Broadcast Networks

The scalability and modularity of RFU-C wireless solutions are ideal for effectively building and expanding contribution and distribution digital broadcast networks. Deployed in an ATM-based, SDH backbone, PDH, or IP network, RFU-C offers reliable high quality transmission of Digital Video Broadcast signals and data. Applications include TV, radio, telemedicine, and others.

Private Networks

FibeAir RFU-C provides transparent mid to high capacity connection of enterprise LAN and PBX systems, which reduces communication costs, operating expenses, and maintenance requirements. Wireless high capacity connectivity is ideal for a variety of private networks and enterprises, such as utility operators, corporate facilities, education campuses, hospitals, banks, and others.

Applications include LAN Ethernet connectivity, VoIP, client-server applications, remote storage, video conferencing, TDM E1/T1 services, network infrastructure redundancy, and others.

Government and Emergency Services

Ceragon's RFU-C meets the high-level demands of government customers by providing rapidly deployed, secure, and long distance data transmission, in a single, compact, light weight, and scaleable solution.

Applications include disaster recovery, temporary installations, broadband voice, data and video services, and surveillance and monitoring.



RFU Frequency Bands

RFU-C is available for ITU-R, CEPT, and FCC channels, in accordance with the table below.

All RFU-Cs (6-38 GHz) support 7-56 MHz bands (for capacities of from 10 to 500 Mbps).

7-56 MHz bandwidth is supported for all frequencies (6-38 GHz).

Freq Band 6L	TX Range	RX Range	Tx/Rx Spacing	Standards	RFU-C Marketing Model
6L GHz	6332.5-6393	5972-6093	300A	ITU-R F.383-7, ITU-R F.384-7 CEPT 14-01E ITU-R F.497-6 CFR47 101.147	RFU-CX-6L-300A-2W3-TH
	5972-6093	6332.5-6393			RFU-CX-6L-300A-2W3-TL
	6249-6306.5	5925.5-6040.5	266A		RFU-CX-6L-266A-1W4-TH
	5925.5-6040.5	6249-6306.5			RFU-CX-6L-266A-1W4-TL
	6361-6418.5	6037.5-6152.5			RFU-CX-6L-266A-5W8-TH
	6037.5-6152.5	6361-6418.5			RFU-CX-6L-266A-5W8-TL
	6245-6290.5	5939.5-6030.5	260A		RFU-CX-6L-260A-1W2-TH
	5939.5-6030.5	6245-6290.5			RFU-CX-6L-260A-1W2-TL
	6365-6410.5	6059.5-6150.5			RFU-CX-6L-260A-3W4-TH
	6059.5-6150.5	6365-6410.5	RFU-CX-6L-260A-3W4-TL		
	6226.89-6286.865	5914.875-6034.825	252B		RFU-CX-6L-252B-1W4-TH
	5914.875-6034.825	6226.89-6286.865			RFU-CX-6L-252B-1W4-TL
	6345.49-6405.465	6033.475-6153.425			RFU-CX-6L-252B-5W8-TH
	6033.475-6153.425	6345.49-6405.465	RFU-CX-6L-252B-5W8-TL		
	6181.74-6301.69	5929.7-6049.65	252A		RFU-CX-6L-252A-1W4-TH
	5929.7-6049.65	6181.74-6301.69			RFU-CX-6L-252A-1W4-TL
	6241.04-6360.99	5989-6108.95			RFU-CX-6L-252A-3W6-TH
	5989-6108.95	6241.04-6360.99			RFU-CX-6L-252A-3W6-TL
	6300.34-6420.29	6048.3-6168.25			RFU-CX-6L-252A-5W8-TH
	6048.3-6168.25	6300.34-6420.29			RFU-CX-6L-252A-5W8-TL
6235-6290.5	5939.5-6050.5	240A	RFU-CX-6L-240A-1W3-TH		
5939.5-6050.5	6235-6290.5		RFU-CX-6L-240A-1W3-TL		
6355-6410.5	6059.5-6170.5		RFU-CX-6L-240A-4W6-TH		
6059.5-6170.5	6355-6410.5		RFU-CX-6L-240A-4W6-TL		



Freq Band 6H GHz	TX Range	RX Range	Tx/Rx Spacing	Standards	RFU-C Marketing Model
6H GHz	6924.5-7075.5	6424.5-6575.5	500	ITU-R F.383-7 CEPT 14- 01E CFR47 101.147	RFU-CX-6H-500A-1W4-TH
	6424.5-6575.5	6924.5-7075.5			RFU-CX-6H-500A-1W4-TL
	7032.5-7091.5	6692.5-6751.5	340C		RFU-CX-6H-340C-1W2-TH
	6692.5-6751.5	7032.5-7091.5			RFU-CX-6H-340C-1W2-TL
	6764.5-6915.5	6424.5-6575.5	340B		RFU-CX-6H-340B-1W4-TH
	6424.5-6575.5	6764.5-6915.5			RFU-CX-6H-340B-1W4-TL
	6924.5-7075.5	6584.5-6735.5			RFU-CX-6H-340B-5W8-TH
	6584.5-6735.5	6924.5-7075.5			RFU-CX-6H-340B-5W8-TL
	6784.5-6935.5	6444.5-6595.5	340A		RFU-CX-6H-340A-1W4-TH
	6444.5-6595.5	6784.5-6935.5			RFU-CX-6H-340A-1W4-TL
	6944.5-7095.5	6604.5-6755.5			RFU-CX-6H-340A-5W8-TH
	6604.5-6755.5	6944.5-7095.5			RFU-CX-6H-340A-5W8-TL
	6707.5-6772.5	6537.5-6612.5	160A		RFU-CX-6H-160A-1W6-TH
	6537.5-6612.5	6707.5-6772.5			RFU-CX-6H-160A-1W6-TL
	6767.5-6832.5	6607.5-6672.5			RFU-CX-6H-160A-7W12-TH
	6607.5-6672.5	6767.5-6832.5			RFU-CX-6H-160A-7W12-TL
	6827.5-6872.5	6667.5-6712.5			RFU-CX-6H-160A-13W16-TH
	6667.5-6712.5	6827.5-6872.5			RFU-CX-6H-160A-13W16-TL



Freq Band 7 GHz	TX Range	RX Range	Tx/Rx Spacing	Standards	RFU-C Marketing Model
7 GHz	7434.5-7585.5	7134.5-7285.5	300A	ITU-R F.385-7 ITU-R F.385-8, CEPT 02- 06	RFU-CX-7-300A-1W5-TH
	7134.5-7285.5	7434.5-7585.5			RFU-CX-7-300A-1W5-TL
	7584.5-7705.5	7284.5-7405.5			RFU-CX-7-300A-6W9-TH
	7284.5-7405.5	7584.5-7705.5			RFU-CX-7-300A-6W9-TL
	7671.5-7786.5	7426.5-7541.5	245A		RFU-CX-7-245A-1W4-TH
	7426.5-7541.5	7671.5-7786.5			RFU-CX-7-245A-1W4-TL
	7783.5-7898.5	7538.5-7653.5			RFU-CX-7-245A-5W8-TH
	7538.5-7653.5	7783.5-7898.5			RFU-CX-7-245A-5W8-TL
	7301.5-7388.5	7105.5-7192.5	196A		RFU-CX-7-196A-1W3-TH
	7105.5-7192.5	7301.5-7388.5			RFU-CX-7-196A-1W3-TL
	7357.5-7444.5	7161.5-7248.5			RFU-CX-7-196A-3W5-TH
	7161.5-7248.5	7357.5-7444.5			RFU-CX-7-196A-3W5-TL
	7594.5-7653.5	7412.5-7471.5	182A		RFU-CX-7-182A-1W2-TH
	7412.5-7471.5	7594.5-7653.5			RFU-CX-7-182A-1W2-TL
	7622.5-7681.5	7440.5-7499.5			RFU-CX-7-182A-2W3-TH
	7440.5-7499.5	7622.5-7681.5			RFU-CX-7-182A-2W3-TL
	7678.5-7737.5	7496.5-7555.5	168C		RFU-CX-7-182A-4W5-TH
	7496.5-7555.5	7678.5-7737.5			RFU-CX-7-182A-4W5-TL
	7580.5-7639.5	7412.5-7471.5			RFU-CX-7-168A-1W2-TH
	7412.5-7471.5	7580.5-7639.5			RFU-CX-7-168A-1W2-TL
	7608.5-7667.5	7440.5-7499.5	168B		RFU-CX-7-168A-2W3-TH
	7440.5-7499.5	7608.5-7667.5			RFU-CX-7-168A-2W3-TL
	7664.5-7723.5	7496.5-7555.5			RFU-CX-7-168A-4W5-TH
	7496.5-7555.5	7664.5-7723.5			RFU-CX-7-168A-4W5-TL
	7609.5-7668.5	7441.5-7500.5	168B		RFU-CX-7-168A-1W2-TH
	7441.5-7500.5	7609.5-7668.5			RFU-CX-7-168A-1W2-TL
	7637.5-7696.5	7469.5-7528.5			RFU-CX-7-168A-2W3-TH
	7469.5-7528.5	7637.5-7696.5			RFU-CX-7-168A-2W3-TL
	7693.5-7752.5	7525.5-7584.5			RFU-CX-7-168A-4W5-TH
	7525.5-7584.5	7693.5-7752.5	RFU-CX-7-168A-4W5-TL		



Freq Band 7 GHz	TX Range	RX Range	Tx/Rx Spacing	Standards	RFU-C Marketing Model
7 GHz	7273.5-7332.5	7105.5-7164.5	168A	ITU-R F.385-7 ITU-R F.385-8, CEPT 02-06 ITU-R F.385-7 ITU-R F.385-8, CEPT 02-06	RFU-CX-7-168A-1W2-TH
	7105.5-7164.5	7273.5-7332.5			RFU-CX-7-168A-1W2-TL
	7301.5-7360.5	7133.5-7192.5			RFU-CX-7-168A-2W3-TH
	7133.5-7192.5	7301.5-7360.5			RFU-CX-7-168A-2W3-TL
	7357.5-7416.5	7189.5-7248.5			RFU-CX-7-168A-4W5-TH
	7189.5-7248.5	7357.5-7416.5			RFU-CX-7-168A-4W5-TL
	7280.5-7339.5	7119.5-7178.5	161P		RFU-CX-7-161P-1W2-TH
	7119.5-7178.5	7280.5-7339.5			RFU-CX-7-161P-1W2-TL
	7308.5-7367.5	7147.5-7206.5			RFU-CX-7-161P-2W3-TH
	7147.5-7206.5	7308.5-7367.5			RFU-CX-7-161P-2W3-TL
	7336.5-7395.5	7175.5-7234.5			RFU-CX-7-161P-3W4-TH
	7175.5-7234.5	7336.5-7395.5			RFU-CX-7-161P-3W4-TL
	7364.5-7423.5	7203.5-7262.5	161O		RFU-CX-7-161P-4W5-TH
	7203.5-7262.5	7364.5-7423.5			RFU-CX-7-161P-4W5-TL
	7597.5-7622.5	7436.5-7461.5			RFU-CX-7-161O-1-TH
	7436.5-7461.5	7597.5-7622.5			RFU-CX-7-161O-1-TL
	7681.5-7706.5	7520.5-7545.5			RFU-CX-7-161O-2-TH
	7520.5-7545.5	7681.5-7706.5			RFU-CX-7-161O-2-TL
	7587.5-7646.5	7426.5-7485.5	161M		RFU-CX-7-161M-1W2-TH
	7426.5-7485.5	7587.5-7646.5			RFU-CX-7-161M-1W2-TL
	7615.5-7674.5	7454.5-7513.5			RFU-CX-7-161M-2W3-TH
	7454.5-7513.5	7615.5-7674.5	RFU-CX-7-161M-2W3-TL		
	7643.5-7702.5	7482.5-7541.5	161K		RFU-CX-7-161K-1W2-TH
	7482.5-7541.5	7643.5-7702.5			RFU-CX-7-161K-1W2-TL
	7671.5-7730.5	7510.5-7569.5			RFU-CX-7-161K-2W3-TH
	7510.5-7569.5	7671.5-7730.5			RFU-CX-7-161K-2W3-TL
	7573.5-7632.5	7412.5-7471.5	161J		RFU-CX-7-161J-1W2-TH
	7412.5-7471.5	7573.5-7632.5			RFU-CX-7-161J-1W2-TL
	7601.5-7660.5	7440.5-7499.5			RFU-CX-7-161J-2W3-TH
	7440.5-7499.5	7601.5-7660.5			RFU-CX-7-161J-2W3-TL
	7657.5-7716.5	7496.5-7555.5			RFU-CX-7-161J-4W5-TH
	7496.5-7555.5	7657.5-7716.5			RFU-CX-7-161J-4W5-TL
7580.5-7639.5	7419.5-7478.5	161I	RFU-CX-7-161I-1W2-TH		
7419.5-7478.5	7580.5-7639.5		RFU-CX-7-161I-1W2-TL		
7608.5-7667.5	7447.5-7506.5		RFU-CX-7-161I-2W3-TH		
7447.5-7506.5	7608.5-7667.5		RFU-CX-7-161I-2W3-TL		

Freq Band 7 GHz	TX Range	RX Range	Tx/Rx Spacing	Standards	RFU-C Marketing Model		
	7664.5-7723.5	7503.5-7562.5			RFU-CX-7-161I-4W5-TH		
	7503.5-7562.5	7664.5-7723.5			RFU-CX-7-161I-4W5-TL		
	7273.5-7353.5	7112.5-7192.5	161F		RFU-CX-7-161F-1W2-TH		
	7112.5-7192.5	7273.5-7353.5			RFU-CX-7-161F-1W2-TL		
	7322.5-7402.5	7161.5-7241.5			RFU-CX-7-161F-2W3-TH		
	7161.5-7241.5	7322.5-7402.5			RFU-CX-7-161F-2W3-TL		
	7573.5-7653.5	7412.5-7492.5			RFU-CX-7-161F-4W5-TH		
	7412.5-7492.5	7573.5-7653.5			RFU-CX-7-161F-4W5-TL		
	7622.5-7702.5	7461.5-7541.5			RFU-CX-7-161F-5W6-TH		
	7461.5-7541.5	7622.5-7702.5			RFU-CX-7-161F-5W6-TL		
	7709-7768	7548-7607			161D	RFU-CX-7-161D-1W2-TH	
	7548-7607	7709-7768				RFU-CX-7-161D-1W2-TL	
	7737-7796	7576-7635	RFU-CX-7-161D-2W3-TH				
	7576-7635	7737-7796	RFU-CX-7-161D-2W3-TL				
	7765-7824	7604-7663	RFU-CX-7-161D-3W4-TH				
	7604-7663	7765-7824	RFU-CX-7-161D-3W4-TL				
	7793-7852	7632-7691	RFU-CX-7-161D-4W5-TH				
	7632-7691	7793-7852	RFU-CX-7-161D-4W5-TL				
	7584-7643	7423-7482	161C		RFU-CX-7-161C-1W2-TH		
	7423-7482	7584-7643			RFU-CX-7-161C-1W2-TL		
	7612-7671	7451-7510			RFU-CX-7-161C-2W3-TH		
	7451-7510	7612-7671			RFU-CX-7-161C-2W3-TL		
	7640-7699	7479-7538			RFU-CX-7-161C-3W4-TH		
	7479-7538	7640-7699			RFU-CX-7-161C-3W4-TL		
	7668-7727	7507-7566			RFU-CX-7-161C-4W5-TH		
	7507-7566	7668-7727			RFU-CX-7-161C-4W5-TL		
	7 GHz	7409-7468	7248-7307		161B	ITU-R F.385-7 ITU-R F.385-8, CEPT 02- 06	RFU-CX-7-161B-1W2-TH
		7248-7307	7409-7468				RFU-CX-7-161B-1W2-TL
		7437-7496	7276-7335				RFU-CX-7-161B-2W3-TH
		7276-7335	7437-7496				RFU-CX-7-161B-2W3-TL
7465-7524		7304-7363	RFU-CX-7-161B-3W4-TH				
7304-7363		7465-7524	RFU-CX-7-161B-3W4-TL				
7493-7552		7332-7391	RFU-CX-7-161B-4W5-TH				
7332-7391		7493-7552	RFU-CX-7-161B-4W5-TL				
7284-7343		7123-7182	161A	RFU-CX-7-161A-1W2-TH			
7123-7182		7284-7343		RFU-CX-7-161A-1W2-TL			



Freq Band 7 GHz	TX Range	RX Range	Tx/Rx Spacing	Standards	RFU-C Marketing Model
	7312-7371	7151-7210			RFU-CX-7-161A-2W3-TH
	7151-7210	7312-7371			RFU-CX-7-161A-2W3-TL
	7340-7399	7179-7238			RFU-CX-7-161A-3W4-TH
	7179-7238	7340-7399			RFU-CX-7-161A-3W4-TL
	7368-7427	7207-7266			RFU-CX-7-161A-4W5-TH
	7207-7266	7368-7427			RFU-CX-7-161A-4W5-TL
	7280.5-7339.5	7126.5-7185.5	154C		RFU-CX-7-154C-1W2-TH
	7126.5-7185.5	7280.5-7339.5			RFU-CX-7-154C-1W2-TL
	7308.5-7367.5	7154.5-7213.5			RFU-CX-7-154C-2W3-TH
	7154.5-7213.5	7308.5-7367.5			RFU-CX-7-154C-2W3-TL
	7336.5-7395.5	7182.5-7241.5			RFU-CX-7-154C-3W4-TH
	7182.5-7241.5	7336.5-7395.5			RFU-CX-7-154C-3W4-TL
	7364.5-7423.5	7210.5-7269.5			RFU-CX-7-154C-4W5-TH
	7210.5-7269.5	7364.5-7423.5			RFU-CX-7-154C-4W5-TL
	7594.5-7653.5	7440.5-7499.5	154B		RFU-CX-7-154B-1W2-TH
	7440.5-7499.5	7594.5-7653.5			RFU-CX-7-154B-1W2-TL
	7622.5-7681.5	7468.5-7527.5			RFU-CX-7-154B-2W3-TH
	7468.5-7527.5	7622.5-7681.5			RFU-CX-7-154B-2W3-TL
	7678.5-7737.5	7524.5-7583.5			RFU-CX-7-154B-4W5-TH
	7524.5-7583.5	7678.5-7737.5			RFU-CX-7-154B-4W5-TL
7 GHz	7580.5-7639.5	7426.5-7485.5	154A	ITU-R F.385-7 ITU-R F.385-8, CEPT 02- 06	RFU-CX-7-154A-1W2-TH
	7426.5-7485.5	7580.5-7639.5			RFU-CX-7-154A-1W2-TL
	7608.5-7667.5	7454.5-7513.5			RFU-CX-7-154A-2W3-TH
	7454.5-7513.5	7608.5-7667.5			RFU-CX-7-154A-2W3-TL
	7636.5-7695.5	7482.5-7541.5			RFU-CX-7-154A-3W4-TH
	7482.5-7541.5	7636.5-7695.5			RFU-CX-7-154A-3W4-TL
	7664.5-7723.5	7510.5-7569.5			RFU-CX-7-154A-4W5-TH
	7510.5-7569.5	7664.5-7723.5			RFU-CX-7-154A-4W5-TL



Freq Band 8 GHz	TX Range	RX Range	Tx/Rx Spacing	Standards	RFU-C Marketing Model
8 GHz	8274.5-8305.5	7744.5-7775.5	530A	F.386-6 CEPT 02-06 F.386-6	RFU-CX-8-530A-1W2-TH
	7744.5-7775.5	8274.5-8305.5			RFU-CX-8-530A-1W2-TL
	8304.5-8395.5	7804.5-7895.5	500A		RFU-CX-8-500A-1W2-TH
	7804.5-7895.5	8304.5-8395.5			RFU-CX-8-500A-1W2-TL
	8023-8186.32	7711.68-7875	311C-J		RFU-CX-8-311C-J-TH
	7711.68-7875	8023-8186.32			RFU-CX-8-311C-J-TL
	8028.695-8148.645	7717.375-7837.325	311B		RFU-CX-8-311B-1W4-TH
	7717.375-7837.325	8028.695-8148.645			RFU-CX-8-311B-1W4-TL
	8147.295-8267.245	7835.975-7955.925			RFU-CX-8-311B-5W8-TH
	7835.975-7955.925	8147.295-8267.245			RFU-CX-8-311A-5W8-TL
	8043.52-8163.47	7732.2-7852.15	311A		RFU-CX-8-311A-1W4-TH
	7732.2-7852.15	8043.52-8163.47			RFU-CX-8-311A-1W4-TL
	8162.12-8282.07	7850.8-7970.75			RFU-CX-8-311A-5W8-TH
	7850.8-7970.75	8162.12-8282.07			RFU-CX-8-311A-5W8-TL
	8212-8302	7902-7992	310D		RFU-CX-8-310D-1W2-TH
	7902-7992	8212-8302			RFU-CX-8-310D-1W2-TL
	8240-8330	7930-8020			RFU-CX-8-310D-2W3-TH
	7930-8020	8240-8330			RFU-CX-8-310D-2W3-TL
	8296-8386	7986-8076			RFU-CX-8-310D-4W5-TH
	7986-8076	8296-8386			RFU-CX-8-310D-4W5-TL
	8212-8302	7902-7992	310C		RFU-CX-8-310C-1W3-TH
	7902-7992	8212-8302			RFU-CX-8-310C-1W3-TL
	8240-8330	7930-8020			RFU-CX-8-310C-2W4-TH
	7930-8020	8240-8330			RFU-CX-8-310C-2W4-TL
	8296-8386	7986-8076			RFU-CX-8-310C-4W6-TH
	7986-8076	8296-8386			RFU-CX-8-310C-4W6-TL
	8380-8470	8070-8160			RFU-CX-8-310C-7W9-TH
	8070-8160	8380-8470			RFU-CX-8-310C-7W9-TL
	8408-8498	8098-8188			RFU-CX-8-310C-8W10-TH
	8098-8188	8408-8498			RFU-CX-8-310C-8W10-TL
8039.5-8150.5	7729.5-7840.5	310A	RFU-CX-8-310A-1W3-TH		
7729.5-7840.5	8039.5-8150.5		RFU-CX-8-310A-1W3-TL		
8159.5-8270.5	7849.5-7960.5		RFU-CX-8-310A-4W6-TH		
7849.5-7960.5	8159.5-8270.5		RFU-CX-8-310A-4W6-TL		
8024.5-8145.5	7724.5-7845.5	300A	RFU-CX-8-300A-1W4-TH		



Freq Band 8 GHz	TX Range	RX Range	Tx/Rx Spacing	Standards	RFU-C Marketing Model
8 GHz	7724.5-7845.5	8024.5-8145.5			RFU-CX-8-300A-1W4-TL
	8144.5-8265.5	7844.5-7965.5			RFU-CX-8-300A-5W8-TH
	7844.5-7965.5	8144.5-8265.5			RFU-CX-8-300A-5W8-TL
	8302.5-8389.5	8036.5-8123.5	266C		RFU-CX-8-266B-1W3-TH
	8036.5-8123.5	8302.5-8389.5			RFU-CX-8-266B-1W3-TL
	8190.5-8277.5	7924.5-8011.5	266B		RFU-CX-8-266B-1W2-TH
	7924.5-8011.5	8190.5-8277.5			RFU-CX-8-266B-1W2-TL
	8176.5-8291.5	7910.5-8025.5	266A		RFU-CX-8-266A-1W4-TH
	7910.5-8025.5	8176.5-8291.5			RFU-CX-8-266A-1W4-TL
	8288.5-8403.5	8022.5-8137.5			RFU-CX-8-266A-5W8-TH
	8022.5-8137.5	8288.5-8403.5	252A		RFU-CX-8-266A-5W8-TL
	8226.52-8287.52	7974.5-8035.5			RFU-CX-8-252A-1W2-TH
	7974.5-8035.5	8226.52-8287.52	RFU-CX-8-252A-1W2-TL		
	8270.5-8349.5	8020.5-8099.5	250A		RFU-CX-8-250A-1W4-TH
	8020.5-8099.5	8270.5-8349.5			RFU-CX-8-250A-1W4-TL
	8326.5-8405.5	8076.5-8155.5			RFU-CX-8-250A-5W8-TH
8076.5-8155.5	8326.5-8405.5	RFU-CX-8-250A-5W8-TL			
8 GHz	8256.5-8371.5	8048.5-8163.5	208A	F.386-6 CEPT 02-06	RFU-CX-8-208A-1W4-TH
	8048.5-8163.5	8256.5-8371.5			RFU-CX-8-208A-1W4-TL
	8368.5-8455.5	8160.5-8247.5			RFU-CX-8-208A-5W7-TH
	8160.5-8247.5	8368.5-8455.5			RFU-CX-8-208A-5W7-TL
	8355.5-8414.5	8201.5-8260.5	154A		RFU-CX-8-154A-1W2-TH
	8201.5-8260.5	8355.5-8414.5			RFU-CX-8-154A-1W2-TL
	8383.5-8442.5	8229.5-8288.5			RFU-CX-8-154A-2W3-TH
	8229.5-8288.5	8383.5-8442.5			RFU-CX-8-154A-2W3-TL
	8439.5-8498.5	8285.5-8344.5	119A		RFU-CX-8-154A-4W5-TH
	8285.5-8344.5	8439.5-8498.5			RFU-CX-8-154A-4W5-TL
	8396.5-8455.5	8277.5-8336.5			RFU-CX-8-119A-1W3-TH
	8277.5-8336.5	8396.5-8455.5			RFU-CX-8-119A-1W3-TL
	8438.5-8497.5	8319.5-8378.5			RFU-CX-8-119A-4W6-TH
	8319.5-8378.5	8438.5-8497.5			RFU-CX-8-119A-4W6-TL



Freq Band	TX Range	RX Range	Tx/Rx Spacing	Standards	RFU-C Marketing Model
10 GHz	10501-10563	10333-10395	168A	CEPT 12-05E	RFU-CX-10-168A-1W2-TH
	10333-10395	10501-10563			RFU-CX-10-168A-1W2-TL
	10529-10591	10361-10423			RFU-CX-10-168A-2W4-TH
	10361-10423	10529-10591			RFU-CX-10-168A-2W4-TL
	10585-10647	10417-10479			RFU-CX-10-168A-5W6-TH
	10417-10479	10585-10647			RFU-CX-10-168A-5W6-TL
	10501-10647	10151-10297	350A		RFU-CX-10-350A-1W5-TH
	10151-10297	10501-10647	RFU-CX-10-350A-1W5-TL		
	10498-10670	10148-10320	350B		RFU-CX-10-350B-1W5w-TH
	10148-10320	10498-10670	RFU-CX-10-350B-1W5w-TL		
	10475-10575	10121-10225	350C		RFU-CX-10-350C-1W5-TH
	10121-10225	10475-10575	RFU-CX-10-350C-1W5-TL		
	10360-10460	10010-10110	350D		RFU-CX-10-350C-1W5-TH
	10010-10110	10360-10460	RFU-CX-10-350C-1W5-TL		
	10561-10707	10011-10157	550A		RFU-CX-10-550A-1W5-TH
	10011-10157	10561-10707			RFU-CX-10-550A-1W5-TL
	10701-10847	10151-10297			RFU-CX-10-550A-6W10-TH
	10151-10297	10701-10847			RFU-CX-10-550A-6W10-TL
	10590-10622	10499-10531	91A		RFU-CX-10-91A-1W4-TH
	10499-10531	10590-10622			RFU-CX-10-91A-1W4-TL
10618-10649	10527-10558	RFU-CX-10-91A-5W8-TH			
10527-10558	10618-10649	RFU-CX-10-91A-5W8-TL			
10646-10677	10555-10586	RFU-CX-10-91A-9W12-TH			
10555-10586	10646-10677	RFU-CX-10-91A-9W12-TL			



Freq Band	TX Range	RX Range	Tx/Rx Spacing	Standards	RFU-C Marketing Model
11 GHz	11430-11720	10940-11200	490,520,530	ITU-R F.387-9, CEPT 12-06 CFR47 101.14	RFU-CX-11-H-TH
	10940-11200	11430-11720			RFU-CX-11-H-TL
	11190-11460	10700-10950			RFU-CX-11-L-TH
	10700-10950	11190-11460			RFU-CX-11-L-TL
13 GHz	13141-13002	12866-12749	266	ITU-R F.497-6, CEPT 1202F	RFU-CX-13-266-1W4w-TH
	12866-12749	13141-13002			RFU-CX-13-266-1W4w-TL
	13246-13127	12990-12858			RFU-CX-13-266-5W8w-TH
	12990-12858	13246-13127			RFU-CX-13-266-5W8w-TL
15 GHz	15117-15341	14627-14851	490	F.636-3, CEPT 12-07E	RFU-CX-15-490B-9W16-TH
	14627-14851	15117-15341			RFU-CX-15-490B-9W16-TL
	14893-15117	14403-14627			RFU-CX-15-490A-1W8-TH
	14403-14627	14893-15117			RFU-CX-15-490A-1W8-TL
	15187-15341	14543-14697	644	ACA (ITU-R F.636-3)	RFU-CX-15-644-TH
	14543-14697	15187-15341			RFU-CX-15-644-TL
	15295-15135	14820-14660	475	F.636-3	RFU-CX-15-475-8W15TH
	14820-14660	15295-15135			RFU-CX-15-475-8W15TL
	15135-14975	14660-14500			RFU-CX-15-475-1W8w-TH
	14660-14500	15135-14975			RFU-CX-15-475-1W8w-TL
	15117-15341	14697-14921	420	CEPT 12-07E	RFU-CX-15-420-8W15TH
	14697-14921	15117-15341			RFU-CX-15-420-8W15TL
	14921-15145	14500-14725			RFU-CX-15-420-1W8-TH
	14501-14725	14921-15145			RFU-CX-15-420-1W8-TL
	14732-14844	15047-15159	315		RFU-CX-15-315-4W7-TL
	15047-15159	14732-14844			RFU-CX-15-315-4W7-TH
	14648-14760	14963-15075			RFU-CX-15-315-1W4-TL
	14963-15075	14648-14760			RFU-CX-15-315-1W4-TH
	15375-15229	14647-14500	728		RFU-CX-15-728-1W4w-TH
	14647-14500	15375-15229			RFU-CX-15-728-1W4w-TL

Freq Band	TX Range	RX Range	Tx/Rx Spacing	Standards	RFU-C Marketing Model
18 GHz	19220-19700	17970-18450	1250	ITU-R F.595-8 CEPT 12-03E	RFU-CX-A-18-L-TH
	17970-18450	19220-19700			RFU-CX-A-18-L-TL
	19160-19700	18150-18690	1010		RFU-CX-E-18-H-TH
	18150-18690	19160-19700			RFU-CX-E-18-H-TL
	18710-19210	17700-18200			RFU-CX-E-18-L-TH
	17700-18200	18710-19210			RFU-CX-E-18-L-TL
	19260-19700	17700-18140	1560		RFU-CX-F-18-TH
	17700-18140	19260-19700			RFU-CX-F-18-TL
23 GHz	23000-23600	22000-22600	1008	ITU-R F.637-3, CEPT 12-02E CFR47 101.147	RFU-CX-E-23-TH
	22000-22600	23000-23600			RFU-CX-E-23-TL
	22400-23000	21200-21800	1232 /1200		RFU-CX-F-23-L-TH
	21200-21800	22400-23000			RFU-CX-F-23-L-TL
	23000-23600	21800-22400			RFU-CX-F-23-H-TH
	21800-22400	23000-23600			RFU-CX-F-23-H-TL
26 GHz	25557-26005	24549-24997	1008	ITU-R F.748-4, CEPT 13-02E	RFU-CX-E-26-L-TH
	24549-24997	25557-26005			RFU-CX-E-26-L-TL
	26005-26453	24997-25445			RFU-CX-E-26-H-TH
	24997-25445	26005-26453			RFU-CX-E-26-H-TL
	25266-25350	24466-24550	800	RFU-CX-F-26-L-TH	
	24466-24550	25266-25350		RFU-CX-F-26-L-TL	
	25050-25250	24250-24450		RFU-CX-F-26-H-TH	
	24250-24450	25050-25250		RFU-CX-F-26-H-TL	



Freq Band	TX Range	RX Range	Tx/Rx Spacing	Standards	RFU-C Marketing Model
28 GHz	28150-28350	27700-27900	450	F.748-4	RFU-CX-F-28-450-H-TH
	27700-27900	28150-28350			RFU-CX-F-28-450-H-TL
	27950-28150	27500-27700			RFU-CX-F-28-450-L-TH
	27500-27700	27950-28150			RFU-CX-F-28-450-L-TL
	27700-27850	28050-28200	350		RFU-CX-F-28-350-H-TH
	28050-28200	27700-27850			RFU-CX-F-28-350-H-TL
	27610-27760	27960-28110			RFU-CX-F-28-350-L-TH
	27960-28110	27610-27760			RFU-CX-F-28-350-L-TL
	27500-27700	27950-28150	490		RFU-CX-F-28-490-L-TH
	27950-28150	27500-27700			RFU-CX-F-28-490-L-TL
	29004-29452	27996-28444	1008		RFU-CX-E-28-H-TH
	27996-28444	29004-29452			RFU-CX-E-28-H-TL
	28556-29004	27548-27996			RFU-CX-E-28-L-TH
	27548-27996	28556-29004			RFU-CX-E-28-L-TL
36 GHz	3600-36300	36700-3700	700	RFU-CX-36-TH	
	36700-3700	3600-36300		RFU-CX-36-TL	
38 GHz	39440-38820	38180-37560	1260	ITU-R F.749-2,	RFU-CX-E-38-H-TH
	38180-37560	39440-38820			RFU-CX-E-38-H-TL
	38936-38316	37676-37045			RFU-CX-E-38-Lw-TH
	37676-37045	38936-38316			RFU-CX-E-38-Lw-TL
	39650-40000	38950-39300	700	RFU-CX-F-38-BH-TH	
	38950-39300	39500-40000		RFU-CX-F-38-BH-TL	
	39300-39650	38600-38950		RFU-CX-F-38-BL-TH	
	38600-38950	39300-39650		RFU-CX-F-38-BL-TL	
	37700-38050	37000-37350		RFU-CX-F-38-AL-TH	
	37000-37350	37700-38050		RFU-CX-F-38-AL-TL	
	38050-38400	37350-37700		RFU-CX-F-38-AH-TH	
	37350-37700	38050-38400		RFU-CX-F-38-AH-TL	

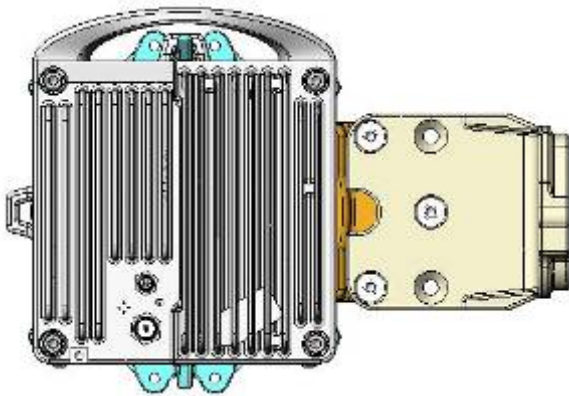
Installation Overview

Direct Mount 1+0

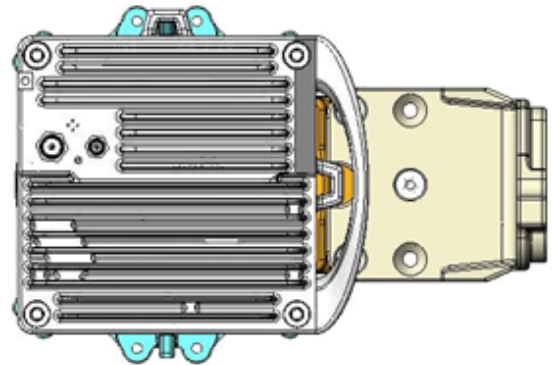
In a direct mount 1+0 configuration, RFU-C is attached directly to the antenna (antenna with RFU-C interface).

For horizontal polarization, the RFU-C is rotated clockwise.

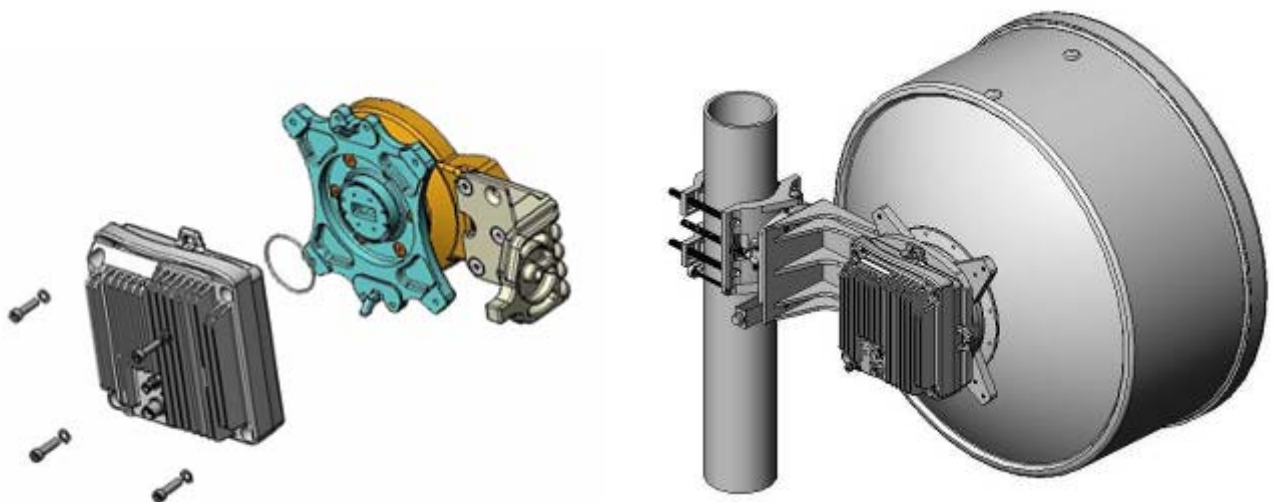
Vertical Pole



Horizontal Pole



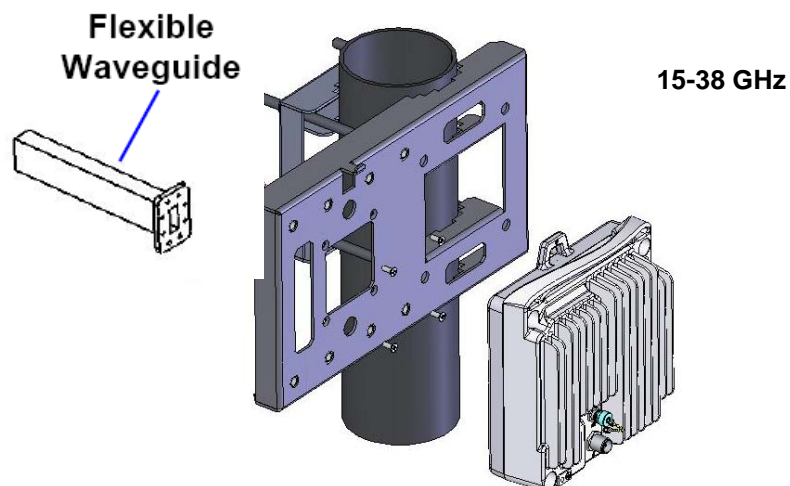
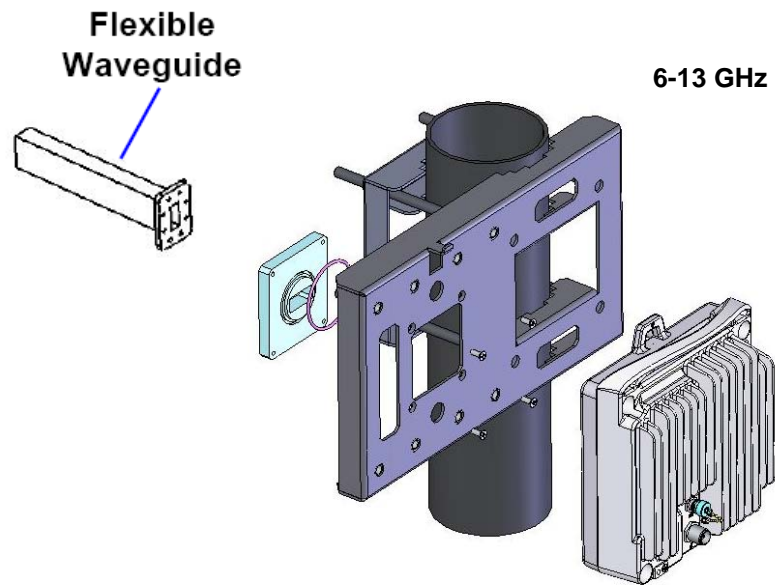
As shown in the following illustration, the RFU-C is placed on the antenna interface, and tightened using four screws.



Remote Mount 1+0

The 1+0 remote mount installation includes the following items:

- Pole mount Fastens the RFU-C to the pole.
- Flexible waveguide Connects the RFU to the antenna port (frequency dependent).
- Adaptor Low frequencies (6-13 GHz) require an adaptor between the RFU-C and the flexible waveguide.

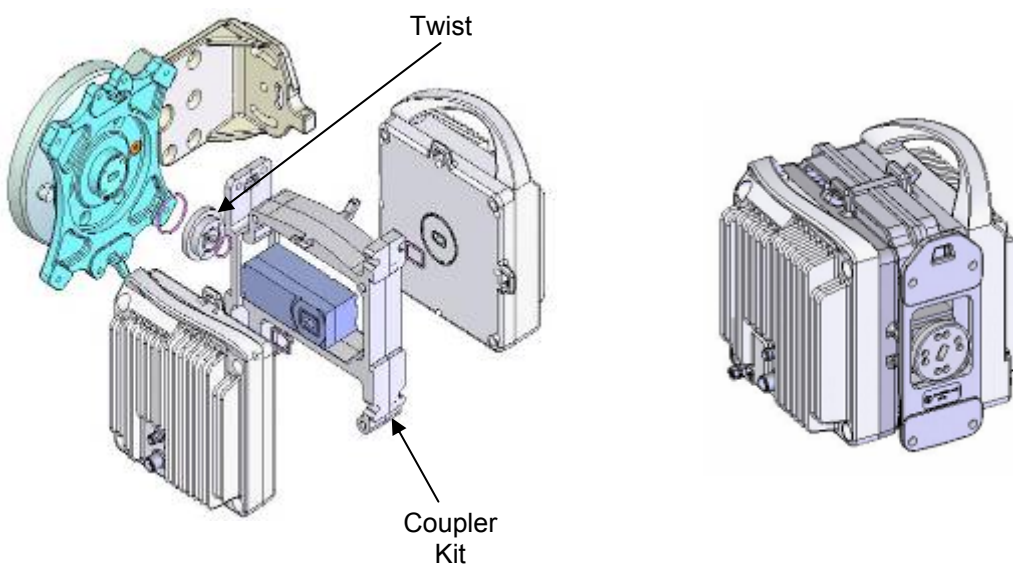
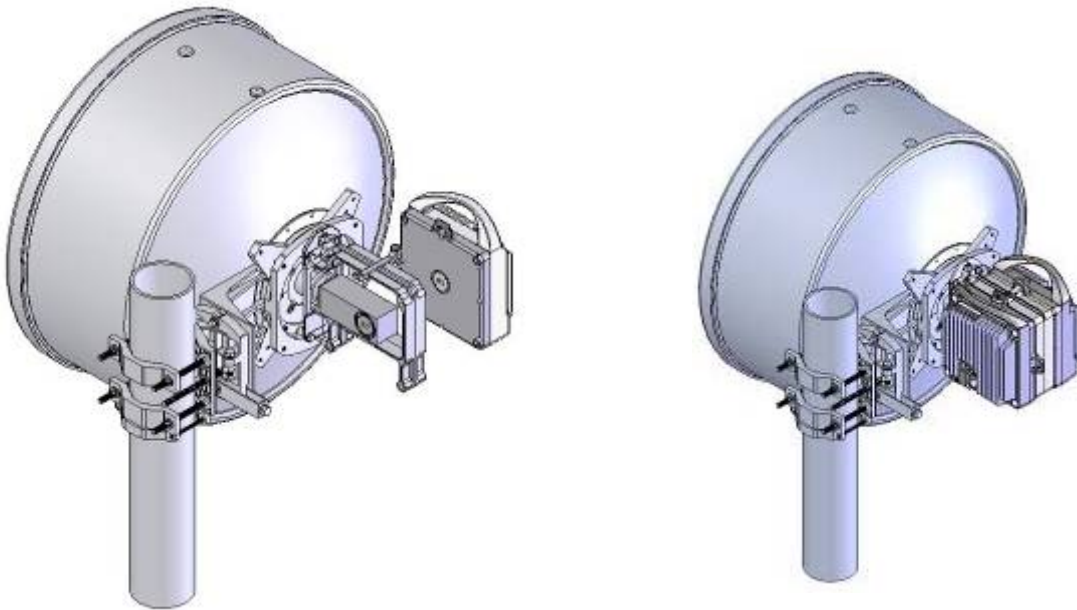


Direct Mount 1+1

The direct mount installation includes the following items:

CPLR Kit Includes a CPLR holder to hold the two RFUs side-by-side, and a coupler (per frequency band) located between the two RFUs.

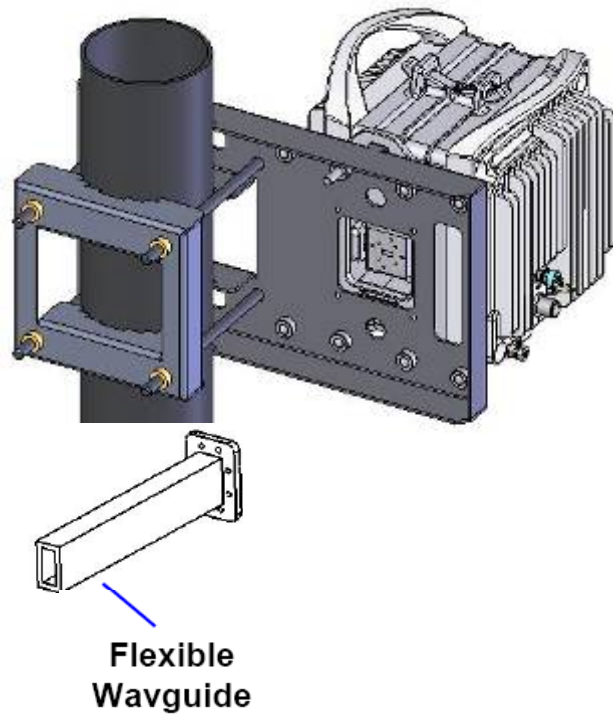
Twist Used to change from vertical to horizontal polarization.



Remote Mount 1+1

The remote mount installation uses the same items as those for the direct mount installation, except the twist, which is not required.

In addition, a pole mount is included, which holds the CPLR kit with the two RFUs. A flexible waveguide connects the coupler flange to the antenna port.



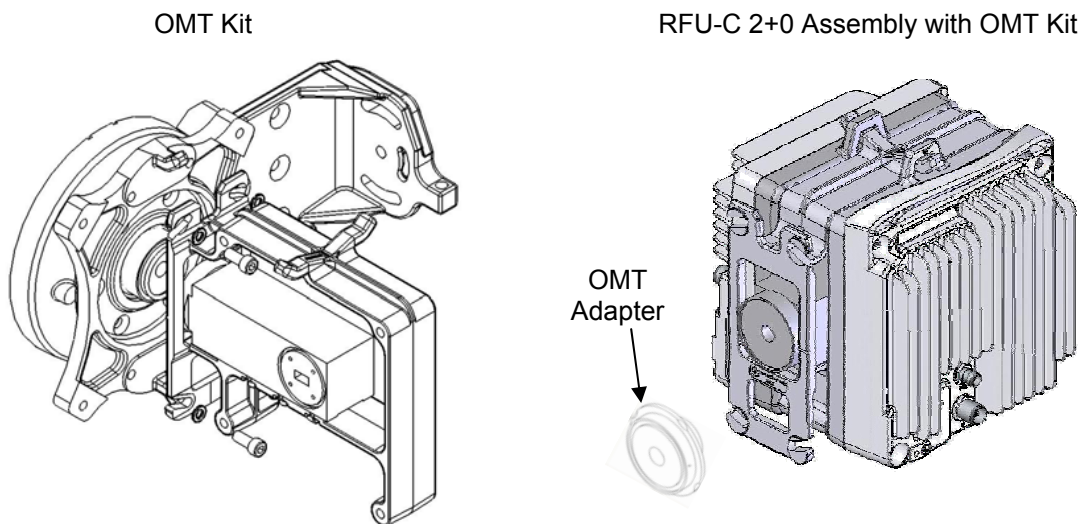
Direct Mount 2+0

In a 2+0 configuration, two RFU-Cs transmit and receive in the same frequency channel, using two orthogonal polarizations. A single polarization antenna can be used with the Ceragon OMT for orthogonal separation between polarizations.

The direct mount installation includes the following items:

OMT Kit - This kit delivers two signals through a circular connection. The OMT is hosted on the RFU-C holder which holds the two RFUs side-by-side, with H & V polarization.

OMT Adapter - This is a Circular Transition connected between the OMT kit and the antenna feeder. The adapter is unique for each antenna vendor (Andrew, Radio Waves, and GD).



Mediation Device (Antenna Mount) Losses

Configuration	Interfaces		6-8 GHz	11 GHz	13-15 GHz	18-26 GHz	28-38 GHz
Flex WG	Remote Mount Antenna	Added to remote mount configurations	0.5	0.5	1.2	1.5	1.5
1+0	Direct Mount	Integrated antenna	0.2	0.2	0.4	0.5	0.5
1+1 HSB	Direct Mount	Main TR	1.6	1.6	1.8	2	2
(with asymmetrical coupler)		Secondary TR	6	6	6	6	6
1+1 HSB	Remote Mount	Main TR	1.4	1.4	1.6	1.8	1.8
(with asymmetrical coupler)		Secondary TR	6	6	6	6	6
2+0 DP (OMT)	Direct Mount	Integrated antenna	0.5	0.5	0.5	0.5	0.5
2+2 HSB (OMT)	Remote Mount	Main TR	1.9	1.9	2.1	2.3	2.3
(with asymmetrical coupler)		Secondary TR	6.5	6.5	6.5	6.5	6.5
2+0/1+1 FD SP	Integrated Antenna		3.8	3.8	3.9	4	4
4+0 DP (OMT)	Remote Mount		4.2	4.2	4.3	4.4	4.4

Notes:

1. The antenna interface is always the RFU-C interface.
2. If other antennas are to be used, an adaptor with a 0.1 dB loss should be considered.
3. Mediation Device Loss Tolerance: OMT (2+0) +/-0.1 dB, CPLR (1+1 HSB) +/-0.7 dB

Item	Loss (dB)			
	6-8 GHz	11 GHz	13-15 GHz	18-38 GHz
Flexible Waveguide	0.5	0.5	1.2	1.5
Main Coupler	1.4	1.4	1.4	1.5
Secondary Coupler	6	6	6	6
Twist	0	0	0	0

Note: The numbers above are typical losses per component.

Antenna Connection

RFU-C uses Andrew, Xian Putian, GD, Radio Wave, Shenglu and RFS antenna types, as follows:

- Andrew: VHLP/HP series
- Xian Putian: WTG/WTC series
- GD: HP series
- Radio Wave
- Shenglu
- RFS: SB/SU series
- Other antennas with **suitable** flanges

RFU-C can be mounted directly for all frequencies (6-38 GHz) using the following antenna types (for integrated antennas, specific antenna PNs are required):

- Andrew: VHLP series
- Xian Putian: WTG/ WTC series
- GD: HP series
- Radio Wave: HP series
- Shenglu: SLC series

For remote mount installations, the flexible waveguide flanges listed in the following table should be used (milimetric). The same antenna type (integrated) as indicated above can be used (recommended). Other antenna types using the flanges listed in the table may also be used.

Frequency		WG Type	Radio side (Remote) Flange Des.	FlexWG both sides Flange Des.	FlexWG both sides Flange Des.	Antenna (Remote) Flange Des.
Band	Range (GHz)					
6(L/U) GHz	5.8-7.1	WR 137	UDR70	PDR70	PDR70	UDR70
7/8 GHz	7.1-8.5	WR 112	UBR84	PBR84	PBR84	UBR84
10 GHz	10.0-10.85	WR 90	UBR100	PBR100	PBR100	UBR100
11 GHz	10.4-11.7					
13 GHz	12.7-13.3	WR 75	UBR120	PBR120	PBR120	UBR120



Frequency		WG Type	Radio side (Remote) Flange Des.	FlexWG both sides Flange Des.	FlexWG both sides Flange Des.	Antenna (Remote) Flange Des.
Band	Range (GHz)					
15 GHz	14.5-15.4	WR 62	UBR140	PBR140	PBR140	UBR140
18 GHz	17.7-19.7	WR 42	UBR220	PBR220	PBR220	UBR220
23 GHz	21.2-23.6					
26 GHz	24.5-26.6					
28 GHz	27.3-29.5	WR 28	UBR320	PBR320	PBR320	UBR320
32 GHz	31.8-33.4					
36 GHz	36.0-37.0					
38 GHz	37.0-40.0					

Other antenna types and flanges may be used with an adaptor. For details, contact Ceragon.



Environmental Conditions Standard Compliance

The system is fully compliant with the following standards:

Operational

ETS 300 019-1-4 class 4.1, with an operating temperature range of -35°C to 55°C.

Storage and Transportation

Storage: ETS 300 019-2-2 class 1.2, with a high temperature limit of +85°C.

Transportation: ETS 300 019-2-2 class 2.2

EMC

System EMC and ESD requirements comply with the conditions specified in EN 300 385 [9], for class B.

Safety Conditions Standard Compliance

The system complies with the UL 1950 and EN 60950 safety standards.

Management

Ceragon provides state-of-the-art management based on SNMP. Our management applications are written in Java code and can control Ceragon units at both the element and network levels.

The applications run on Windows 2000/2003/XP/Vista, UNIX, and Sun Solaris.

CeraView[®] is Ceragon's EMS (Element Management System) that enables the operator to perform element configuration, performance monitoring on RF and SDH/SONET levels, remote diagnostics, alarm reports, and more. CeraView[®] integrates with different NMS (Network Management System) platforms, such as HP OpenView and SNMPc, to provide more comprehensive system management.



Example of CeraView[®] Main Window

PolyView[™] is Ceragon's network management system that can monitor network element status, provide statistical and inventory reports, download software and configuration to elements in the network, and more.

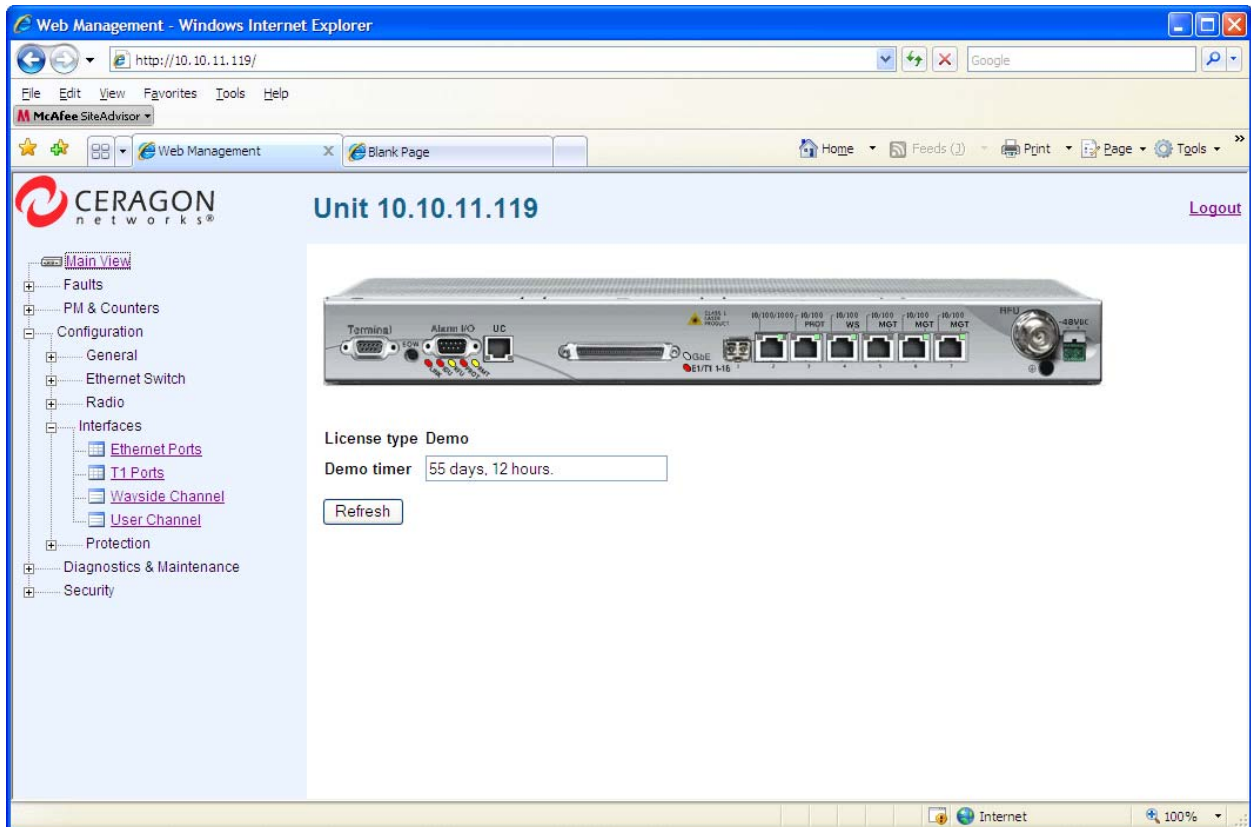
PolyView[™] includes CeraMap[™], its own powerful and friendly graphical interface. It can also integrate with other NMS platforms, such as HP OpenView, to provide more comprehensive network management.

A...	Time	Stat...	IP	Name	Sev...	Module	Description
	30-Mar-06 06:10:01	Clear	172.24.30.92	LAB - 92		MUX	Trib HP: LOP Raised
✓	30-Mar-06 06:04:17	Raise	172.24.30.92	LAB - 92		MUX	Trib HP: LOM Raised
	30-Mar-06 05:58:05	Raise	172.24.30.92	LAB - 92		MUX	Trib HP: RDI Raised
✓	30-Mar-06 05:58:05	Raise	172.24.30.92	LAB - 92		MUX	Trib HP: PLM Raised
	30-Mar-06 05:58:05	Raise	172.24.30.92	LAB - 92		MUX	Trib HP: Signal Degrade Raised
	30-Mar-06 05:56:37	Raise	172.24.30.92	LAB - 92		MUX	Trib MS: RDI Raised
✓	30-Mar-06 05:44:58	Clear	172.24.30.92	LAB - 92		MUX	Trib MS: RDI Raised
✓	30-Mar-06 05:44:58	Clear	172.24.30.92	LAB - 92		MUX	Trib HP: RDI Raised
	30-Mar-06 05:44:58	Clear	172.24.30.92	LAB - 92		MUX	Trib HP: PLM Raised
	30-Mar-06 05:44:58	Clear	172.24.30.92	LAB - 92		MUX	Trib HP: Signal Degrade Raised

Example of PolyView[™] Window



FibeAir IP-10 is managed by an integrated Web-Based Element Manager. Each device includes an HTTP based element manager that enables the operator to perform element configuration, RF, Ethernet, and PDH performance monitoring, remote diagnostics, alarm reports, and more.





FibeAir RFU-C Specifications

Note: All specifications are subject to change without prior notification.

General

Capacity	Variable 10-500 Mbps per IDM
Channel Bandwidth	7/10/14/20/25/28/29.65 /29/30/40/50/55/56 MHz
Modulation Type	QPSK, 8PSK, 16, 32, 64, 128, 256 QAM
System Configurations	Unprotected: 1+0, 2+0 Protected: 1+1, 2+2, Co-channel operation with XPIC (CCDP) Space Diversity, Frequency Diversity
Wayside Channels	E1/DS1, bridged Ethernet 10BaseT per carrier
User Channels	V.11, or RS-232, or 10BaseT, or G.703 (optional)
Engineering Order Wire	CVSD audio channel (64 Kbps)
Interface Modules	E1s, T1s STM-1/OC-3: Electrical - CMI/BNC, Optical - SM/SC, SM/MM Fast Ethernet: 10/100BaseT Fast Ethernet, Auto-negotiation, Full/Half duplex GbE: SFP: Electrical 1000BaseT, Optical 1000Base-LX (1310 nm) or SX (850 nm)
Switching	Hitless, Errorless
Payload Types	TDM: PDH-E1s/T1s, SDH:STM-1, SONET OC-3, ATM: ATM over SONET/SDH IP: Ethernet

Network Management

Type	SNMP, in compliance with RFC 1213, RFC 1595 (SONET MIB)
Local or Remote NMS Station	CeraView and PolyView with advanced GUI for Windows 98/2000/XP/NT or UNIX, integrated with HP OpenView
NMS Interface	Ethernet bridge 10Base-T, RS-232 (PPP, SLIP), built-in Ethernet hub
Local Configuration and Monitoring	Standard ASCII terminal, serial RS-232
In-Band Management	DCCr, DCCm, media-specific, proprietary
TMN	Ceragon NMS functions are in accordance with ITU-T recommendations for TMN
Performance Monitoring	Integral with onboard memory per ITU-T G.828



Mechanical/Electrical

RFU-C	Height: 200 mm Width: 200 mm Depth: 85 mm Weight: 4kg/9 lbs
RFU-Antenna Connection	Direct mount or remote using the same antenna type Remote mount: Standard flexible waveguide (frequency dependent)
IDU-RFU Connection	Coaxial cable RG-223 (100 m/300 ft), Belden 9914/RG-8 (300 m/1000 ft) or equivalent, N-type connectors (male)
Power Consumption RFU-C 6-26 GHz	1+0: 22W 1+1: 39W
Power Consumption RFU-C 28-38 GHz	1+0: 26W 1+1: 43W
Temperature Range	-35 C to +55 C
Relative Humidity	Up to 100% (all weather operation)
Operating Range	-40.5 to -72 VDC
Polarization	Vertical or Horizontal
Standard Mounting OD Pole	50 mm-120 mm/2"-4.5" (subject to vendor and antenna size)



Radio Specifications

6-18 GHz

Specification	6L,6H GHz	7,8 GHz	10 GHz	11 GHz	13 GHz	15 GHz	18 GHz
Standards	ETSI, FCC	ETSI	ETSI	ETSI, FCC	ETSI	ETSI	ETSI, FCC
Operating Frequency Range (GHz)	5.85-6.45, 6.4-7.1	7.1-7.9, 7.7-8.5	10-10.85	10.7-11.7	12.75-13.3	14.4-15.35	17.7-19.7
Tx/Rx Spacing (MHz)	252.04, 240,266, 300,340, 160,170,500	154,161,16 8,182,196,2 45,300,119, 311.32	91,168, 350,550	490,520, 530	266	315,420, 644,490, 728	1010,1120, 1008,1560
RF Channel Spacing (MHz)	10,28, 29, 29.65, 30,40,56	7,10,14,28, 29, 29.65, 30,40,56	7,14,28,56	28, 29, 29.65, 30,40	7,14,28,56	7,14,28,56	7,14,20, 27.5, 40,55,80
Frequency Stability	+0.001%						
Frequency Source	Synthesizer						
RF Channel Selection	Via NMS						
Tx Range (Manual/ATPC)	Up to 20 dB dynamic range (Frequency & modulation depended)						

23-38 GHz

Specification	23 GHz	24-26 GHz	28 GHz	32 GHz	36 GHz	38 GHz
Standards	ETSI, FCC	ETSI, FCC	ETSI, FCC	ETSI, FCC	ETSI	ETSI, FCC
Operating Frequency Range (GHz)	21.2-23.65	24.2-26.5	27.35-31.3	31.8-33.4	36-37	37-40
Tx/Rx Spacing (MHz)	1008,1200, 1232,	800,900, 1008	350,450,490, 1008	812	700	1000,1260,700
RF Channel Spacing (MHz)	7,14,20,28, 50,56,60	7,14,28,40,56	7,14,20,28, 50,56,60	7,14,28,56	7,14,20,28 50	7,14,20,28 50,56,60
Frequency Stability	+0.001%					
Frequency Source	Synthesizer					
RF Channel Selection	Via NMS					
Tx Range (Manual/ATPC)	Up to 20 dB dynamic range (Frequency & modulation depended)					



FibeAir IP-10 Transmit Power (dBm) Specifications

Modulation	6-8 GHz	11-15 GHz	18-23 GHz	26 GHz	28 GHz	36 GHz	38 GHz
QPSK	26	24	22	21	14	12	18
8 PSK	26	24	22	21	14	12	18
16 QAM	25	23	21	20	14	11	17
32 QAM	24	22	20	19	14	10	16
64 QAM	24	22	20	19	14	10	16
128 QAM	24	22	20	19	14	10	16
256 QAM	22	20	18	17	12	8	14

* All values are guaranteed values.

Appendix: 6-8 GHz Frequency Channels

Note: For additional channel schemes, please contact your Ceragon representative.

6L GHz (5.85-6.45 GHz)

ITU-R F.383-7 [1-3]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
240	1	5955.00	1	6195.00
	2	5995.00	2	6235.00
	3	6035.00	3	6275.00
	4	6075.00	4	6315.00
	5	6115.00	5	6355.00
	6	6155.00	6	6395.00

ITU-R F.383-7 [0] / FCC 101.147(i8)				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
252.04	1	5945.20	1	6197.24
	2	5974.85	2	6226.89
	3	6004.50	3	6256.54
	4	6034.15	4	6286.19
	5	6063.80	5	6315.84
	6	6093.45	6	6345.49
	7	6123.10	7	6375.14
	8	6152.75	8	6404.79

FCC 101.147(i7)				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
252.04	1	5935.32	1	6187.36
	2	5945.2	2	6197.24
	3	5955.08	3	6207.12
	4	5964.97	4	6217.01
	5	5974.85	5	6226.89
	6	5984.73	6	6236.77
	7	5994.62	7	6246.66
	8	6004.5	8	6256.54
	9	6014.38	9	6266.42
	10	6024.27	10	6276.31
	11	6034.15	11	6286.19
	12	6044.03	12	6296.07
	13	6053.92	13	6305.96
	14	6063.8	14	6315.84
	15	6073.68	15	6325.72
	16	6083.57	16	6335.61
	17	6093.45	17	6345.49
	18	6103.33	18	6355.37
	19	6113.22	19	6365.26
	20	6123.1	20	6375.14
	21	6132.98	21	6385.02
	22	6142.87	22	6394.91
	23	6152.75	23	6404.79
	24	6162.63	24	6414.67

ITU-R F.384-7				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
260	1	5955.00	1	6215.00
	2	6015.00	2	6275.00
	3	6075.00	3	6335.00
	4	6135.00	4	6395.00

ITU-R F.497-6 [0]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
266	1	5941.00	1	6207.00
	2	5969.00	2	6235.00
	3	5997.00	3	6263.00
	4	6025.00	4	6291.00
	5	6053.00	5	6319.00
	6	6081.00	6	6347.00
	7	6109.00	7	6375.00
	8	6137.00	8	6403.00

6H GHz (6.45-7.1 GHz)

ITU-R F.384-7				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
340	1	6460.00	1	6800.00
	2	6500.00	2	6840.00
	3	6540.00	3	6880.00
	4	6580.00	4	6920.00
	5	6620.00	5	6960.00
	6	6660.00	6	7000.00
	7	6700.00	7	7040.00
	8	6740.00	8	7080.00

FCC 101.147(k7)				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
170	1	6545	1	6715
	2	6555	2	6725
	3	6565	3	6735
160	4	6585	4	6745
	5	6595	1	6755
	6	6605	2	6765
	7	6615	3	6775
	8	6625	4	6785
	9	6635	5	6795
	10	6645	6	6805
	11	6655	7	6815
	12	6665	8	6825
	13	6675	9	6835
	14	6685	10	6845
	15	6695	11	6855
	16	6705	12	6865

7 GHz (7.1-7.9 GHz)

ITU-R 385-7 [1]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
154A	1	7442	1	7596
	2	7470	2	7624
	3	7498	3	7652
	4	7526	4	7680
	5	7554	5	7708

ITU-R 385-7 [1]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
154B	1	7456	1	7610
	2	7484	2	7638
	3	7512	3	7666
	4	7540	4	7694
	5	7568	5	7722

ITU-R 385-7 [0]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
161	1	7138.5	1	7299.5
	2	7226	2	7387
	3	7428	3	7589
	4	7526	4	7687

ITU-R 385-7 [1]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
245	1	7442	1	7687
	2	7470	2	7715
	3	7498	3	7743
	4	7526	4	7771
	5	7554	5	7799
	6	7582	6	7827
	7	7610	7	7855
	8	7638	8	7883

ITU-R 385-7 [0]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
161A	1	7138.5	1	7299.5
	2	7166.5	2	7327.5
	3	7194.5	3	7355.5
	4	7222.5	4	7383.5
	5	7250.5	5	7411.5
	11	7145.5	11	7306.5
	12	7173.5	12	7334.5
	13	7201.5	13	7362.5
	14	7229.5	14	7390.5
	21	7152.5	21	7313.5
	22	7180.5	22	7341.5
	23	7208.5	23	7369.5
	24	7236.5	24	7397.5
	31	7159.5	31	7320.5
	32	7187.5	32	7348.5
33	7215.5	33	7376.5	
34	7243.5	34	7404.5	

ITU-R 385-7 [0]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
161B	1	7263.5	1	7424.5
	2	7291.5	2	7452.5
	3	7319.5	3	7480.5
	4	7347.5	4	7508.5
	5	7375.5	5	7536.5
	11	7270.5	11	7431.5
	12	7298.5	12	7459.5
	13	7326.5	13	7487.5
	14	7354.5	14	7515.5
	21	7277.5	21	7438.5
	22	7305.5	22	7466.5
	23	7333.5	23	7494.5
	24	7361.5	24	7522.5
	31	7284.5	31	7445.5
	32	7312.5	32	7473.5
33	7340.5	33	7501.5	
34	7368.5	34	7529.5	

ITU-R 385-7 [0]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
161C	1	7438.5	1	7599.5
	2	7466.5	2	7627.5
	3	7494.5	3	7655.5
	4	7522.5	4	7683.5
	5	7550.5	5	7711.5
	11	7445.5	11	7606.5
	12	7473.5	12	7634.5
	13	7501.5	13	7662.5
	14	7529.5	14	7690.5
	21	7452.5	21	7613.5
	22	7480.5	22	7641.5
	23	7508.5	23	7669.5
	24	7536.5	24	7697.5
	31	7459.5	31	7620.5
	32	7487.5	32	7648.5
33	7515.5	33	7676.5	
34	7543.5	34	7704.5	

ITU-R 385-7 [0]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
161D	1	7563.5	1	7724.5
	2	7591.5	2	7752.5
	3	7619.5	3	7780.5
	4	7647.5	4	7808.5
	5	7675.5	5	7836.5
	11	7570.5	11	7731.5
	12	7598.5	12	7759.5
	13	7626.5	13	7787.5
	14	7654.5	14	7815.5
	21	7577.5	21	7738.5
	22	7605.5	22	7766.5
	23	7633.5	23	7794.5
	24	7661.5	24	7822.5
	31	7584.5	31	7745.5
	32	7612.5	32	7773.5
33	7640.5	33	7801.5	
34	7668.5	34	7829.5	

ITU-R 385-7 [0]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
161I	1	7435	1	7596
	2	7463	2	7624
	3	7491	3	7652
	4	7519	4	7680
	5	7547	5	7708

ITU-R 385-7 [0]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
161J	1	7428	1	7589
	2	7456	2	7617
	3	7484	3	7645
	4	7512	4	7673
	5	7540	5	7701

ITU-R 385-7 [0]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
161K	1	7498	1	7659
	2	7526	2	7687
	3	7554	3	7715

ITU-R 385-7 [3]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
168B	1	7457	1	7625
	2	7485	2	7653
	3	7513	3	7681
	4	7541	4	7709
	5	7569	5	7737

ITU-R 385-7 [1]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
182	1	7428	1	7610
	2	7456	2	7638
	3	7484	3	7666
	4	7512	4	7694
	5	7540	5	7722

ITU-R 385-7 [3]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
196	1	7121	1	7317
	2	7149	2	7345
	3	7177	3	7373
	4	7205	4	7401
	5	7233	5	7429

ITU-R 385-7 [4]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
245	1	7442	1	7687
	2	7470	2	7715
	3	7498	3	7743
	4	7526	4	7771
	5	7554	5	7799
	6	7582	6	7827
	7	7610	7	7855
	8	7638	8	7883

8 GHz (7.8-8.5 GHz)

ITU-R 386-6 [4]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
266	1	7926	1	8192
	2	7954	2	8220
	3	7982	3	8248
	4	8010	4	8276
	5	8038	5	8304
	6	8066	6	8332
	7	8094	7	8360
	8	8122	8	8388

ITU-R 386-6 [1]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
311.32A	1	7747.70	1	8059.02
	2	7777.35	2	8088.67
	3	7807.00	3	8118.32
	4	7836.65	4	8147.97
	5	7866.30	5	8177.62
	6	7895.95	6	8207.27
	7	7925.60	7	8236.92
	8	7955.25	8	8266.57

ITU-R 386-6 [1]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
311.32B	1	7732.875	1	8044.195
	2	7762.525	2	8073.845
	3	7792.175	3	8103.495
	4	7821.825	4	8133.145
	5	7851.475	5	8162.795
	6	7881.125	6	8192.445
	7	7910.775	7	8222.095
	8	7940.425	8	8251.745

ITU-R 386-6 [3]				
T/R Separation	n (L)	Center Frequency MHz	n (H)	Center Frequency MHz
119	1	8293	1	8412
	2	8307	2	8426
	3	8321	3	8440
	4	8335	4	8454
	5	8349	5	8468
	6	8363	6	8482