RADWIN 2000 PORTFOLIO
CARRIER-CLASS
POINT-TO-POINT SOLUTIONS

RADWIN 2000 carrier-class SUB-6 GHz Point-to-point portfolio is ideal for carriers and a variety of vertical markets that require high capacity backhaul and access connectivity

RADWIN

RADWIN 2000 PORTFOLIO
CARRIER-CLASS POINT-TO-POINT SOLUTIONS

The RADWIN 2000 portfolio offers sub-6 GHz licensed and unlicensed wireless broadband products that deliver high throughput of up to 250 Mbps, long range and unmatched robustness. Supported bands include   2.3-2.7 GHz, 3.3-3.8 GHz, 4.4-6.0 GHz and 5.9-6.4 GHz. Compact and robust, RADWIN 2000 products provide Ethernet and native TDM (up to 16 E1s/T1s), thus enabling seamless migration from TDM to all-IP networks.

RADWIN 2000 radios incorporate state-of-the-art technologies including MIMO and OFDM. Unique air interface capabilities secure performance optimization, enabling high spectral efficiency and robust performance in dense radio environments and multipath conditions. In addition, RADWIN 2000 radios support advanced networking features such as QoS, VLAN and Q in Q.

RADWIN 2000 radios can be deployed in point-to-point and multiple point-to-point topologies and support intra-site and inter-site TDD synchronization to maximize network capacity. To ensure maximum service availability, RADWIN radios incorporate built-in 1+1 redundancy and ring protection functionality.

RADWIN's products comply with worldwide regulations and standards and are deployed globally by leading carriers, service providers and public and private networks requiring high-capacity connectivity.

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RADWIN 2000 Portfolio Highlights

» Up to 250 Mbps net aggregate throughput

» Native TDM (up to 16 E1s/T1s) + Ethernet

» Long range - up to 120 Km/75 miles

» Telco-grade, extremely robust in harsh conditions

» Unmatched performance in dense radio environments

» Field proven operation in nLOS / NLOS path conditions

» Inter & Intra site TDD synchronization to maximize network capacity

» Multi-band radio supports multiple frequency bands on same platform

» QoS and VLAN capabilities

» Ethernet service protection through 1+1 and ring topologies

» Extremely simple to install and maintain

HIGH-CAPACITY RADIOS FOR IP & TDM BACKHAUL

RADWIN 2000 C-*Plus*-Series

Delivering up to 250Mbps Ethernet throughput for IP backhaul or bandwidth demanding applications requiring guaranteed QoS. RADWIN 2000 C-*Plus* provides best of breed performance in a highly congested spectrum and in nLOS/NLOS due to enhanced interference mitigation and auto selection between MIMO and Diversity modes.

RADWIN 2000 C-Series

Delivering up to 200 Mbps net aggregate throughput and up to 16 E1s/T1s this radio unit is ideal for operators seeking a carrier-class solution for IP and TDM backhaul with high availability and guaranteed QoS. Delivering IP and TDM over the same link enables seamless migration from legacy TDM to all-IP networks.
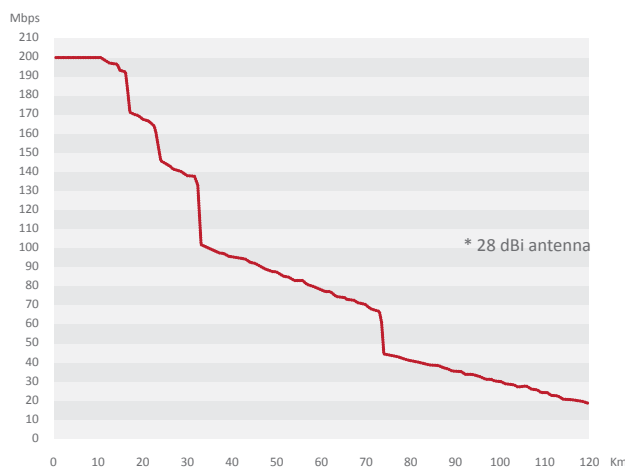
RADWIN 2000 B-Series

Delivering up to 50 Mbps net aggregate throughput and up to 8 E1s/T1s. This radio is upgradable to 100 and 200Mbps via a software key. The radio unit is available with a 23dbi antenna or with a small form factor antenna and built-in connectors for an optional external antenna. This unique configuration assures greater installation flexibility while reducing inventory burden. The radio unit is ideal for carrier-class IP and TDM access and backhaul applications that require high availability and guaranteed QoS.

RADWIN PtP radios operate in symmetric and asymmetric modes: RADWIN 2000 B & C-Series uplink and downlink capacity is dynamically allocated based on traffic load and air-interface conditions, while in RADWIN 2000 C-*Plus* the ratio between the uplink and downlink capacity is configurable. Extremely simple to install and maintain, these solutions operate flawlessly in the most challenging surroundings, including non-line-of-sight scenarios, dense environments and extreme temperatures.

For operators who want to break the capacity barrier and meet the skyrocketing demand for broadband, RADWIN's radios are the right choice.

RADWIN 2000 C-Series Total Throughput
@ 40 MHz Channel BW

RADWIN 2000 B-Series Total Throughput
@ 20 MHz Channel BW

* 28 dBi antenna
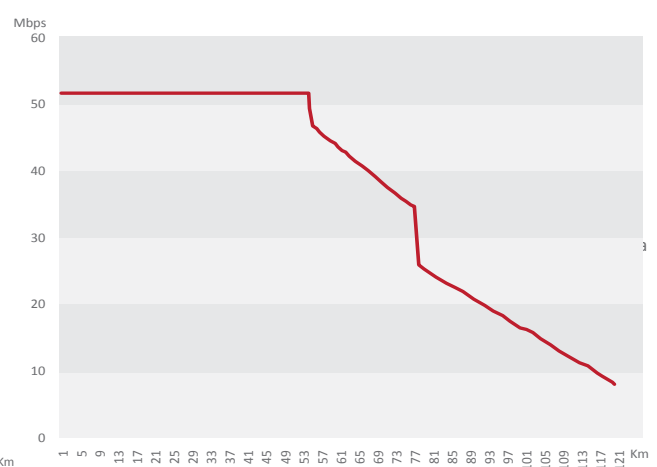
RADWIN 2000 C *Plus*-Series Highlights

» Up to 250Mbps Ethernet throughput

» 40 Km/25 miles

» Fixed asymmetric capacity

RADWIN 2000 C-Series & RADWIN 2000 B-Series Highlights

» Pay as you grow 50 to 200Mbps net aggregate throughput

» Native TDM (up to 16 E1s/T1s) + Ethernet

» Long range - up to 120 Km/75 miles

» Fixed or dynamic asymmetric capacity

» Ethernet service protection through 1+1 and ring topology

"RADWIN 2000 is robust and durable enough to withstand the toughest outdoor conditions, and is very simple to install and maintain."

Jim Makepeace
Director of Network Engineering
Revol Wireless
USA

"RADWIN's links have exceeded our expectations in terms of capacity, security and robustness.

The bandwidth provided by the wireless network has been phenomenal and we are able to transfer massive amounts of data files and x-ray images in seconds."

Dr I Hansrod
Medical Director
Jackpersad Radiology Center
South Africa

ODU with Integrated Antenna

IDU-H

Ethernet aggregation unit for 6 ODUs

IDU-E

Ethernet + 2 E1s/T1s indoor unit

IDU-C

Ethernet + 4, 8, 16 E1s/T1s indoor unit

RADWIN 2000 A-SERIES FOR IP & TDM ACCESS

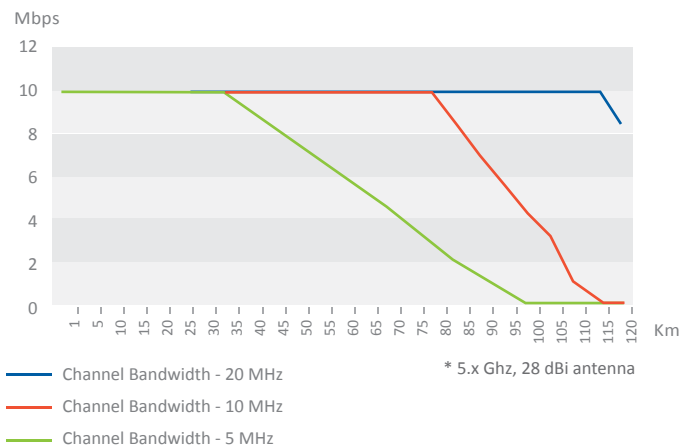RADWIN 2000 A-Series radios are available in three models:

• Supporting 50Mbps net Ethernet throughput and up to 8 E1s / T1s

• Supporting 25 Mbps net Ethernet throughput and up to 4 E1s/T1s

• Supporting 10 Mbps net throughput.

The Ethernet capacity can easily be upgraded to 25 Mbps and 50Mbps via a software key. This assures a low initial investment while securing future capacity growth.

RADWIN 2000 A-Series radios are ideal for carrier access applications that require SLAs and for private networks seeking carrier-class solutions. Incorporating the RADWIN 2000 advanced features, RADWIN 2000 A-Series radios enable optimal spectrum utilization using MIMO and OFDM technologies, combined with RADWIN's field-proven interference mitigation techniques critical for operation in dense urban environments.

Housed in compact, extremely small form factor units, the RADWIN 2000 A-Series radios are ideal for deployments where a small equipment footprint is required.

RADWIN 2000 A-Series 10 Mbps - Total Throughput

Mbps

* 5.x Ghz, 28 dBi antenna

— Channel Bandwidth - 20 MHz
— Channel Bandwidth - 10 MHz
— Channel Bandwidth - 5 MHz

RADWIN 2000 A-Series 25 Mbps - Total Throughput

Mbps

* 5.x Ghz, 28 dBi antenna

— Channel Bandwidth - 20 MHz
— Channel Bandwidth - 10 MHz
— Channel Bandwidth - 5 MHz
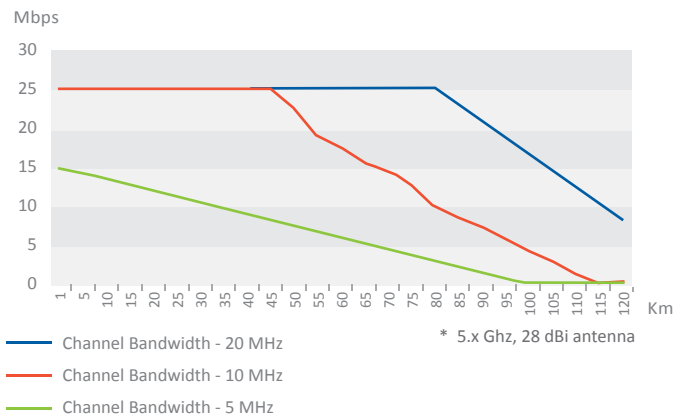
RADWIN 2000 Specifications

Configuration

Architecture	ODU: Outdoor Unit with Integrated Antenna, Embedded Antenna or Connectorized Unit for External Antenna IDU: Indoor Unit or PoE device
IDU to ODU Interface	Outdoor CAT-5e cable; Maximum cable length: 100m for 100BaseT and 75m for 1000BaseT

	C-*Plus* Series	C-Series	B-Series	A-Series
Max Throughput				
Ethernet	250Mbps	200Mbps	50Mbps	10Mbps, 25Mbps, 50Mbps
TDM E1 / T1 Trunks	-	16	8	- 4 8
Radio				
Range	Up to 40km / 25 miles	Up to 120km/75 miles		
	3.300-3.800 / 3.65GHz 4.900-6.060 GHz	2.297-2.482 GHz 2.489-2.700 GHz 3.300-3.800 / 3.65 GHz 4.390-5.010 GHz 4.900-6.060 GHz 5.890-6.410 GHz	2.402-2.482 GHz 2.489-2.700 GHz 4.900-6.060 GHz 5.890-6.410 GHz	2.402-2.482 GHz 4.890-5.960 GHz
Channel Bandwidth	5/10/20/40 MHz	5/10/20/40 MHz	5/10/20 MHz	5/10/20 MHz
Maximum Tx Power	25 dBm @ 2.49-2.7 GHz, 3.3-3.8 GHz, 4.4-6.4GHz 26 dBm @ 2.3-2.47 GHz			
Adaptive Modulation & Coding	Supported			
Automatic Channel Selection	Supported			
Bandwidth Allocation	Configurable Asymmetric TDD	Adaptive Asymmetric TDD		
Diversity	Polarization and Spatial Diversity supported			
Spectrum View	Built-in Spectrum Analyzer			
Duplex Technology	TDD			
Radio Modes	Auto MIMO/Diversity selection	MIMO/Diversity/Single		
Encryption, US Security	AES 128, AES 256,FIPS-197	AES128, FIPS-197		
TDD Synchronization	Intra-site and inter-site using GPS			Intra site
Maximum Information Rate	Configurable in steps of 1Kbps			

Radio Parameters at 20 MHz Channel Bandwidth

Modulation	2x2 MIMO-OFDM							
	BPSK	QPSK		16QAM		64QAM		
Forward Error Correction (FEC) Rate	1/2	1/2	3/4	1/2	3/4	2/3	3/4	5/6
Air Rate [Mbps]	13	26	39	52	78	104	117	130
Sensitivity (dBm) @ BER <10E-11, 20MHz Chbw	-88	-86	-83	-81	-80	-72	-70	-67

RADWIN 2000 Specifications

Ethernet Interface

Ports	PoE Device: 1 port 10/100/1000BaseT IDU-C and IDU-E: 2 ports 10/100BaseT and 10/100/1000BaseT in IDU-C E0 IDU-H: 6 PoE ports, 10/100/1000BaseT 2 LAN ports, 10/100/1000BaseT, 2 SFP ports GbE
Connector	RJ-45
SFP Port	Supported in IDU-C type FE and IDU-H type GbE
Service Protection	Built in support: 1+1 and Ring topology

Ethernet Bridging

VLAN	802.1Q, 802.1P and QinQ Tagging
QoS	4 levels supported
Maximum Frame Size	2048 bytes
Latency	< 3msec

TDM Interface

Number of Ports	Up to 16 E1s/T1s in IDU-C; 2 E1s/T1s in IDU-E
Type	E1/T1 configurable by RADWIN Manager
Framing	Unframed (transparent)
Timing	Independent timing per port, Tx and Rx
Connector	RJ-45
Standards Compliance	ITU-T G.703, G.826
Line Code	E1: HDB3 @ 2.048 Mbps; T1: B8ZS/AMI @ 1.544 Mbps
Latency	Configurable: 5-20 msec (default: 8 msec)
Impedance	E1: 120Ω, balanced; T1: 100Ω, balanced
Jitter & Wander	According to ITU-T G.823, G.824
Service Protection	Monitored Hot Standby (MHS) 1+1 (using IDU-C)

Management

Link Management Application	RADWIN Manager
Protocol	SNMPv1, SNMPv3 and Telnet
NMS Application	RADWIN NMS (RNMS)
Web- based Management	Web access via browser

Mechanical

Dimensions and Weight	C-*Plus* & C & B-Series: ODU with Integrated Antenna: 37.1cm(w) x 37.1cm(h) x 11cm(d); 3.5 kg / 7 lbs C-*Plus* & C & B-Series: ODU Connectorized: 19.5cm(w) x 27.0cm(h) x 8.0cm(d); 1.8 kg / 3.6 lbs A-Series: ODU with integrated Antenna: 21.4(w)x19.7(h)x7.7(d)cm; 1.3kg / 2.8lbs A-Series Connectorized ODU: 17.1(w)x19.6(h)x7.2(d)cm; 1.1kg / 2.4lbs IDU-C: 43.6cm(w) x 4.4cm(h) x 21cm(d); 1.5 kg / 3.3 lbs IDU-E: 22cm(w) x 4.4cm(h) x 17cm(d); 0.5kg / 1.1 lbs IDU-H: 1U Half 19" width, 1.5kg / 3.3 lbs

Power

Power Feeding	-20 to -60 VDC (dual feed in IDU-C); 100-240 VAC, 50/60 Hz
Power Consumption	C-*Plus* & C&B-Series: 20-35W (ODU+IDU); 5-15W (ODU+PoE device) A-Series: 15W (ODU+IDU); 10W (ODU+PoE device)

Environmental

Operating Temperatures	ODU: -35°C to 60°C / -31°F to 140°F; For -55°C / -67°F advise local RADWIN REP IDU: 0°C to 50°C / 32°F to 122°F
Humidity	ODU: 100% condensing, IP67 (totally protected against dust and immersion up to 1m); IDU-C: 90% non-condensing
Shock and Vibration	EN 300 019-2-4 IEC 60068-2 Class4M5
HazLoc	ANSI/ISA: Class I and II, division 2 and Class III, Division 1 and 2 CAN/CSA: Class I, Division 2[1]

Radio Regulations

FCC	47CFR, Part 15 Subparts C&E; Part 90 Subpart Y 47CFR, Part 27
IC (Canada)	RSS-210, RSS-111 RSS 192, issue-3
EN (ETSI)	300 328; 301 893; 302 502, 302_326-2,
WPC (India)	GSR-38
MII (China)	5.8 GHz Band Regulation

Safety

FCC/IC (cTUVus)	UL 60950-1, UL 60950-22, CAN/CSA C22.2 60950-1, CAN/CSA C22.2 60950-22
ETSI	EN/IEC 60950-1, EN/IEC 60950-22

EMC

FCC	47CFR Class B, Part15, Subpart B
ETSI	EN 300 386, EN 301 489-1, EN 301 489-4
CAN/CSA	CISPR 22-04 Class B

[1] HazLoc in RADWIN 2000 C-Series 4.900-6.060 GHz FCC model only

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