

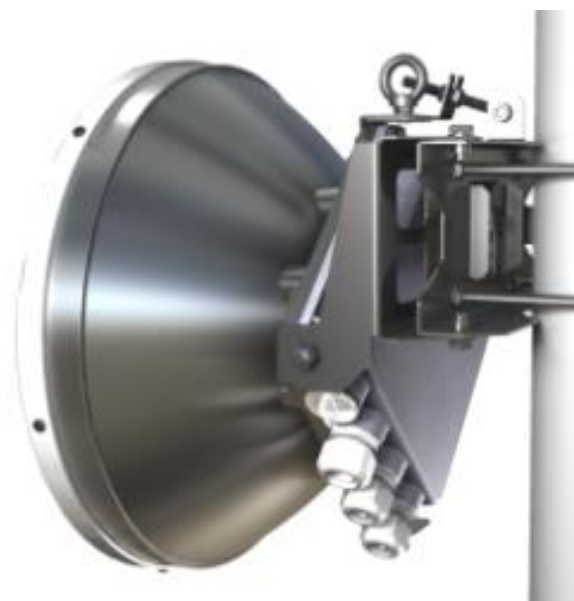


Integra

SAF Tehnika – the pioneer of compact full outdoor microwave radio technology – is excited to make a step forward in the evolution of full outdoor packet microwave radio systems. Integra is an unbelievably light, energy efficient carrier-grade system that exemplifies an outstanding return on smart engineering – the synergy of high competence in radio electronics and materials science. Integration of next generation microwave radio with high and super high performance antennas into a single unit translates into a lower total cost of ownership, as well as less time spent on the installation site, and better reliability of the link even in densely served areas.

Perfect for small-cell, RAN, and HetNet backhaul where aesthetics in a metropolitan area are a key concern, Integra delivers ambitious performance in a compact package never before available in licensed microwave backhaul. Integra's embedded software takes full advantage of its cutting edge network processor providing SyncE and 1588 v2 PTP support for LTE network builds, Layer 2 header compression and 256-bit AES encryption for public safety, government, and enterprise networks. Thanks to a convenient design and its solid functionality the Integra is an industry-unique, right-out-of-the-box microwave system with a superior radiation pattern and payload capacity of up to 420Mbps per channel/polarization.

Integra – by its form and specification – is a proper building block for a variety of modern wireless networking applications. To stay advanced and competitive in the telecom world that will increasingly depend on seamless integration and interoperability of synchronization-sensitive systems, it is smart to invest in technology that takes the right direction. The concept of Integra is on that path.



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*Integra datasheet
Version v1.04, July 2013
All data are subject to change without prior notice*



Technical specification

General			
Concept / form factor		FODU and antenna integration	
Capacity		Up to 448 Mbps payload full duplex at 56MHz 1024QAM, Up to 465 Mbps payload full duplex at 60MHz 1024QAM, Up to 876 Mbps payload full duplex in 2+0 configuration, <i>up to 1Gbps throughput*</i>	
Frequency bands		15GHz, 17GHz UL, 18GHz, 23GHz, 24GHz UL <i>and more*</i>	
Modulation		QAM1024	
Channel bandwidth		ETSI: From 3.5 MHz up to 56MHz FCC: from 5 MHz up to 60MHz	
Integrated antenna			
Sizes		0.2m / 2/3ft	0.3m / 1ft 0.6m / 2ft
Antenna		High Performance and <i>Super High Performance*</i>	
Ports			
Gigabit Ethernet	1x RJx45	Electrical with built-in PoE splitter	
	2x SFP	Fiber Optics or Electrical	
Service ports	3.5mm	Audio alignment and RSSI	
	USB B	Terminal Access	
	LED	Power On and visual alignment	
Ethernet			
Ethernet		Built-in Carrier Ethernet Gigabit Network Processor	
Managed Gigabit Switch functionality		8021.Q VLANs with QoS including WRED, shaping and DWRR Spanning Tree Protocol, Jumbo frames <i>and more*</i>	
Management		SNMP v1/2c/3, SSH, HTTPS, Serial, Radius, Network Time Protocol	
Synchronization		SyncE, <i>IEEE 1588v2 PTP*</i>	
Carrier Ethernet functionality		Provider Bridging, MEF9&14, High Efficiency Header Compression, AES 256 encryption, <i>MPLS-TP*, OAM*</i>	
Electrical & Mechanical			
Power consumption, max		< 35W	
Size, 0.6m / 2ft, w/o mount		669 x 669 x 289 mm / 26.3" x 26.3" x 11.4"	
Size, 0.3m / 1ft, w/o mount		378 x 378 x 227 mm / 14.9" x 14.9" x 9"	
Mount size, max		292 x 176 x 250 mm / 11.5" x 7" x 10" max	
Supported pole size		Ø 40 – 120 mm / Ø 1.6" – 4.7"	
Temperature range		-33 ... +55 °C / -28 ... +130 °F	
Weight, 0.6m		< 5kg / 11 lbs	

* Inquire SAF representative for more information

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Preliminary RSL Threshold (dBm) and Ethernet Throughput (Mbps)

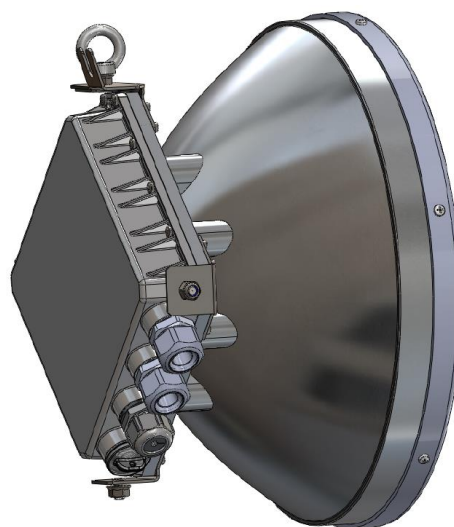
ETSI channels	3.5 MHz		7 MHz		14 MHz		20 MHz		28 MHz		40 MHz		56 MHz	
Modulation	RSL	Eth	RSL	Eth	RSL	Eth	RSL	Eth	RSL	Eth	RSL	Eth	RSL	Eth
4QAM	-96	4	-95	8	-93	17	-90	25	-88	35	-87	50	-85	70
16QAM	-96	8	-95	16	-93	33	-90	51	-88	69	-87	99	-85	142
32QAM	-90	10	-88	20	-86	44	-84	64	-82	88	-81	127	-79	179
64QAM	-86	13	-84	27	-82	56	-80	85	-78	115	-77	165	-75	236
128QAM	-83	16	-82	33	-80	67	-78	102	-75	138	-74	199	-72	283
128QAM W	-80	17	-	-	-	-	-	-	-	-	-	-	-	-
256QAM	-	-	-79	39	-77	79	-75	119	-72	161	-71	232	-69	330
256QAM W	-	-	-75	41	-	-	-	-	-	-	-	-	-	-
512QAM	-	-	-	-	-73	90	-71	136	-69	184	-68	265	-66	377
512QAM W	-	-	-	-	-70	97	-	-	-	-	-	-	-	-
1024QAM	-	-	-	-	-	-	-68	153	-66	207	-65	298	-62	424
1024QAM W	-	-	-	-	-	-	-65	164	-62	220	-61	317	-58	448

FCC channels	5 MHz		10 MHz		20 MHz		25 MHz		30 MHz		40 MHz		50 MHz		60 MHz	
Modulation	RSL	Eth	RSL	Eth	RSL	Eth	RSL	Eth	RSL	Eth	RSL	Eth	RSL	Eth	RSL	Eth
4QAM	-95	5	-94	12	-91	24	-89	31	-88	37	-87	52	-86	63	-85	73
16QAM	-95	10	-94	24	-91	49	-89	62	-88	74	-87	102	-86	127	-85	147
32QAM	-89	12	-88	30	-84	62	-83	78	-82	94	-81	130	-79	160	-79	186
64QAM	-85	17	-84	40	-80	82	-79	104	-78	123	-77	170	-76	212	-75	245
128QAM	-83	20	-81	48	-78	99	-76	124	-75	148	-74	204	-73	255	-72	294
128QAM W	-80	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-
256QAM	-	-	-78	56	-75	115	-73	145	-72	173	-71	239	-70	297	-69	343
256QAM W	-	-	-74	60	-	-	-	-	-	-	-	-	-	-	-	-
512QAM	-	-	-	-	-71	132	-70	166	-69	198	-68	273	-66	340	-65	391
1024QAM	-	-	-	-	-68	148	-67	187	-66	223	-64	307	-63	382	-62	440
1024QAM W	-	-	-	-	-65	158	-63	200	-62	237	-60	326	-59	409	-58	465

Maximum Tx Power

Modulation	Tx power, dBm	
	15, 18, 23 GHz	17, 24 GHz*
4 QAM	+20	+3
16 QAM	+19	+3
32 QAM	+18	+3
64 QAM	+17	+3
128 QAM	+17	+3
256 QAM	+16	+3
512 QAM	+15	+3
1024 QAM	+12	+3

* Max Tx power settings depend on national regulatory allowance and size of antenna



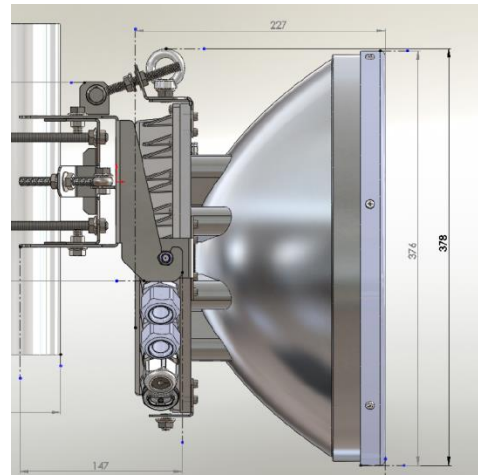
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Antenna Gain

Size	Freq [GHz]	Gain [dBi]
0.2m	15	29
	18	31
	23	33.2
0.3m	15	32.1
	18	34.2
	23	35.3
0.6m	15	36.8
	18	38.9
	23	40.5



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