



ETSI

Wireless without
Boundaries

IP100c Series Microwave Radio System



Indoor Unit



Outdoor Unit

Outdoor Unit +
Antenna



6 - 38
GHz

L

100
Mbps

LOS

FE

PTP

Split
in/out

Programmable bandwidths with capacities up to 100* Mbps

Features & Benefits

- Licensed Frequency Bands
- Point to Point Link
- 4, 8, 16, 28, 32 or 42 E1 Interface options
- 1 E3 Option
- Low Latency Ethernet up to 100 Mbps*
- Adaptive Modulation for increased availability
- Jumbo Frames up to 9600 Bytes
- Field upgradeable by Plug-in Assembly
- RF, IF, Digital Loop back Capability
- Built-in BER Monitor
- Delay Setting for Hitless (errorless) switching
- Wide Operating Temperature Range
- Wide DC Power Input Range
- Low Power Consumption
- SNMP Management
- Up to 300 Meter separation between IDU and ODU
- Small attractive profile

IP100c Overview

This full duplex (FD) point to point IDU and ODU microwave full duplex radio system is a flexible, low-cost, feature-rich solution for microwave radios in the global telecommunications market.

The IP100c is a low-cost point-to-point microwave radio system for IP/PDH payload. IP100c supports software-configurable capacity (8 - 100 Mbps) and channel bandwidths (7 MHz to 28 MHz), as well as field-replaceable plug-in modules for all common payload interfaces.

IP100c employs proprietary ASIC modem technology to achieve superior performance at a low cost. The system features powerful Trellis Coded Modulation (TCM) schemes with significant improvements to system gain and interference-immunity, directly translating to longer links, smaller antennas and lower network-deployment cost.

IP100c forms a low-cost, highly competitive IP / PDH radio system. Common applications include mobile backhaul infrastructure, PTT access and trunk networks, competitive local access networks, and enterprise/campus networks.

IP100 meets carrier-grade standards for performance, reliability and quality.

- Field-replaceable plug-in modules with flexible combinations of interfaces:
 - IP interfaces: 4x10/100Base-T
 - PDH interfaces: 4xE1 to 42xE1
- Software-configurable:
 - *Capacity (8 Mbps to 100 Mbps) or 2x Capacity with XPIC
 - Modulation (4, 8, 16, 32, 64, 128, 256 QAM)
 - Channel bandwidth (7 MHz, 14 MHz, and 28 MHz)
 - IP-PDH payload throughput-allocation
- 1+1 configuration with no additional switching hardware
- Hitless (errorless) Rx protection switching
- Hot-Standby, Space-Diversity, Frequency-Diversity, Tributary-Diversity
- Support of ring applications with East/West aggregate payload and local add/drop for E1s
- Auxiliary EOW voice and data channels
- SNMP management with integral routing
- Configuration backup via removable NVRAM
- Common 1RU IDU for all frequency bands, capacities, modulations and channel bandwidths
- Superior receiver sensitivity and system gain performance



Technical Information

The **IP100c** is a low-cost point to point FDD/PDH, OC3 and IP digital microwave radio system for Ethernet or E1 payload.

The **IP100c** Series products support capacities up to 100 Mbps* Ethernet + E1s (any part of which can be allocated to E1 capacity up to 42xE1s).

The **IP100c** operates in frequency ranges from 6 to 38 GHz. It is available in Non-Protected (1+0) and protected (1+1) mode in HSB, MHSB, frequency diversity (FD), and Space diversity (SD) configuration. The IP100c is also configurable for Repeater Operation. It can be mounted directly on properly equipped antennas using our snap-on mount, or it can be mounted separately and connected using standard UBR flange series waveguide.

The **IP100c** meets carrier—grade standards for performance, reliability, and quality.

KEY FEATURES

- 1RU Standalone
- Flexible Tx and Rx IF to ODU
- Standard Interfaces
- E3 Option
- Supports Customized NMS, SNMP
- Adaptive Modulation Option

BENEFITS

- Low Cost Means - Better Margins
- Quick to Deploy
- Network Option Cards for Easy Upgrade and Expansion
- Easily Deployed and Activated

APPLICATIONS

- Ethernet IP
- TDM/PDH/IP Radio Networks
- Cellular Backhaul
- Trunking or Access Networks

SERVICES

AVAILABLE

- Technical Support
- Installation and Setup
- Maintenance
- Application Support
- Hardware Support
- Extended Warranty

For more information on any of our products or services please visit us on the Web at:

www.wniglobal.com

Customer Network Data Interface Options

Physical

- Ethernet Full duplex 100BaseTX
- Nx E1 Full Duplex E1

Connector

- Ethernet RJ-45
- Nx E1 2xRJ-48C, HD60

Compliance

- Ethernet IEEE 802.3
- E3, Telcordia
- Nx E1 ITU-T

Auxiliary Connections

- Voice Service Channel 6 Wire, PTT Handset
- Data Service Channel 64kbps
- Alarm Port Two Form C relay alarm outputs

Options

- Additional Modem/IF for single chassis protected or east/west mode
- Switching Fabric for drop-and-insert between TDM/IP traffic
- E1 High Density Cable



Protected (1+1) or Twice (2x) throughput configuration (2+0)

Initial System Requirements

Network Interface	Network Processor	Modem	Intermediate Frequency
<p>Standard Configuration</p> <p>Scalable Ethernet nx E1 Wayside or Traffic In-band Control Channel 10/100/1000 BaseTx</p>	<p>Standard Configuration</p> <p>Flexible Platform Processor OAM&P Security Built-in Web Server</p>	<p>Standard Configuration</p> <p>Flexible modulation: QPSK - 256QAM Selectable Error - Correction Coding Equalization Pre-distortion Built-in Link Support: BER</p>	<p>Standard Configuration</p> <p>Transmit: 350 MHz Receive: 140 MHz</p>
<p>Options</p> <p>Additional n x E1 (32 max.) 1 x E3 (via)</p>		<p>Option</p> <p>Adaptive Modulation (choose any 3 constellations) Second plug-in modem for protected or east/west mode</p>	<p>Options</p> <p>Variable Digital IF for various bandwidths Second IF for plug-in modem for protected or east/west mode</p>

RF/ODU Specifications

Description	Specifications - Typical														
Frequency Range	6L	6U	7	8	10	11	13	15	18	23	26	28	32	38	
	Frequency Bands (GHz)														
	5.9 to 6.4	6.4 to 7.1	7.1 to 7.9	7.9 to 8.5	10.0 to 10.685	10.7 to 11.7	12.7 to 13.3	14.4 to 15.4	17.7 to 19.7	21.2 to 23.6	24.2 to 26.5	27.5 to 29.5	31.8 to 33.4	37.0 to 40.0	
T/R Spacing (MHz)	240, 252.04	340	154, 160, 161, 168, 196, 245	119, 126, 151.614, 208, 266, 311.32	65, 91, 143.5, 230, 350	490, 500, 530	266	315, 420, 475, 490, 640, 644, 728	1010, 1560	1008, 1200, 1232	TBA	TBA	TBA	TBA	
Transmitter															
Type	Dual Conversion – Transmitter Power by Modulation Type														
Xmit Pwr (dBm) Max. @ QPSK	30.0	30.0	30.0	30.0	27.0	28.0	26.0	26.0	25.0	25.0	25.0	25.0	23.0	23.0	
Xmtr Attn Step (dB)	5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	
Xmit Pwr Range (dBm)	-10+30	-10+30	-10+30	-10+30	-10+27	-10+28	-1+26	-10+26	-10+25	-10+25	-10+25	-10+25	-10+23	-10+23	
Xmit Power at 128 QAM	24.0	24.0	24.0	24.0	21.0	21.0	18.0	18.0	17.0	17.0	17.0	17.0	16.0	16.0	
TX Power Accuracy at Maximum Command(s)	± 1.5 dB (max)														
Slew Rate	7.85 kHz/us														
	Group Delay over 48MHz														
Linear	< 5.0 ns														
Parabolic	< 7.0 ns														
Channel Flatness	2 dB, within ±43% of channel BW referenced from center frequency														
TX Spectrum Mask	Meets ESTI Requirements														
Tx Power Accuracy over Command Range (Max)	± 2.0 dB (max)														
Output Power Muted	< -50 dBm														
Frequency Accuracy	± 7 ppm maximum, includes temp variation and aging, ± 8 ppm for 8GHz TR31 1.32 and TRI51 .614, ± 9 ppm for 6GHzTR252.04														
Synthesizer Step Size Modulation	250 (except for 8GHz TR31 1.32:529.464 and TR151.614:530.091, 6GHz TR252.04:352.976)														
Output Return Loss												> 10 dB		> 6 dB (> 10 Opt.)	
Receiver															
Receiver Noise Figure @ -65 dBm RSL (dB)	7.0	7.0	7.0	7.0	6.5	6.5	6.5	6.5	6.5	7.0	7.0	N/A	8.0	8.0	
Synthesizer Step Size (KHz)	250 (except for 8 GHz TR 311.32 : 529.464 and TR 151.614 : 530.091, 6 GHz TR 252.04 : 352.976)														
Typical High RSL* (dBm)	-20 (QPSK, 16/32 QAM)														
Typical Threshold*	QPSK ~-92, 16 QAM ~-85, 32 QAM ~-78, 64 QAM ~-75, 128 QAM ~-69, 256 QAM ~-63														
CW Interferences*	Meets ETSI Requirements														
Receive Signal Level Indicator (V _{BNC})	4.5 (typical) @ -20 dBm RSL, 0.1 (typical) @ -90 dBm RSL, monotonic														
RSL versus V _{BNC}	RSL (dBm) = 15.77 V _{BNC} -91.58														
RSL Accuracy** [@ V _{BNC}] (dB) (Max)	± 3.0, -70 ≤ RSL ≤ -30 dBm														
RSL Accuracy** (dB)	±2 -70 dBm to -30 dBm, ±3 -90 dBm to -20 dBm over temperature and frequency														
Input Return Loss (dB)												≥ 10		≥ 6 (≥ 10 optional)	
Group Delay Typical (ns)	Total over 12 MHz (Narrow)					Linear over 28 MHz (Wide)					Parabolic over 28 MHz (Wide)				
	100					10					10				
ODU Interface															
Connector Type	N Type														
Cable Impedance	50 Ohms														
TX IF Frequency	350 MHz														
RX IF Frequency	140 MHz														
Primary Power															
Power Dissipation	33.0 to 72.0 VDC, either polarity: 52 (Nom @ 48), 58 (Max @ 33) Watts						19.2 to 72.0 VDC, either polarity: 40 (Nom @ 48), 48 (Max @ 19.2)								
Protection Circuit	Power and protected by IDU (inrush current – ETS 300 132-2)														
CW Rejection															
CW Rejection to adjacent channels	56 MHz (Wide) ± 56 MHz >9 dB ± 112 MHz >20 dB						14 MHz (Narrow) ± 14 MHz >9 dB ± 28 MHz >20 dB								
Environmental, Etc.															
Operating	ETS 300 019-2-4 Class 4M5 to (-33 +55 °C)														
Cold Start Conditions	Power Supply Operational @ -45 °C, ODU will transmit, no guarantee of quality of service.														
Storage	ETS 300-019-2-1														
Transport	ETS 300-019-2-2														
Mechanical	Weight (3.7 kg), Size (107mm D x 225mm H x 225mm W)														
Finish	(Corro-Coat PE 71-190Z (Powder Coat), Gloss White)														
Ground Lug	M5 x .8 x 9.5 long														
Antenna Interface (WR and/or Circ. Inch)	***	***	1.025	1.025	75 or .740	75 or .740	75 or .620	62 or .560	42 or .455	42 or .375	42 or .370	N/A	28 or .250	.219	

* Compliance depends on Customer's unique MODEM attributes.

Compliance - Summation

Outdoor Unit (ODU) Interface

Intermediate Freq. Range Tx: 350 MHz, Rx: 140 MHz
Emissions Bandwidths ETSI, FCC
ODU Command Interface ODU specific

Modem Capability

*Capacity Options Throughput from 1 - 100 Mbps or with XPIC 2x Capacity
Modulation Programmable: QPSK, 16-QAM, 32-QAM, 64-QAM, 128-QAM, 256-QAM
FEC (Trellis Coded Modulation concatenated with Reed-Solomon Coding)

Network Management

Support SNMP
Connector 10/100BaseTX

Environmental

Temperature -5° to +55°C
Relative Humidity 0 to 95%, non-condensing
Power 50-75 Watts (depending on Network
Data Interface and ODU type)

Mechanical

Dimensions 1RU, ETSI compliant

Payload Parameters

IP Interface 4x100/1000BaseT, RJ-45 connector
Standards Compliance IEEE 802.3ab, 802.1Q
User Data Channel 64 kbps, V.11, DB-15 connector
Voice Orderwire 64 kbps, Standard handset interface

Configuration

Radio Protection 1+0 or 1+1 Hot standby, 'hitless' receiver switching with either frequency or space diversity
Tributary Protection Single or Dual tributary
Power Protection Dual inputs with redundant feed (1+1 configuration)
Voice EOW Interface Standard handset interface or VoIP option
User Channel Interface V.11 or G.703, DB-15 connector

Mechanical/Environmental

Dimensions IDU: 1U, 444.5 mm W x 240 mm D x 44.5 mm H
ODU: 267 mm Diameter x 89 mm H
Weight IDU: 4.0 Kg, ODU: 4.7 Kg
Operating Temperature IDU: -5° to +45°C, ODU: -33° to +55°C (ODU)
Altitude 4500 meters
Humidity IDU: 95% non-condensing, ODU: 100% all-weather
Power Input -48V DC (-40.5 to -57 VDC)
Power Consumption ODU: 1+0: ≤65 watts, 1+1 ≤130 watts
Power Connector 2-pin male
Cooling Natural Convection
IDU-ODU Interface Coaxial N-type connector
ODU Cable Belden 9913/RG-8, up to 300m*
Standards Compliance ETSI ETS 300 019
* longer with LMR400 or equivalent

Management

Protocol SNMPv1
Local Access Ethernet 10Base-T, RJ-45
Remote IDU Access Out-of-band integrated routing over link and interconnected LANs
Craft Interface VT-100, via local craft RS-232/DB-9 port or remote via telnet session
External Alarms 4 inputs and 3 Form-C outputs, DB-25 connector

Standards Compliance ETSI EN 302 217-2, ETSI EN 301 489, ETSI EN 300 132-2, IEC EN 60950

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Specifications and availability are subject to change without notice.
Performance specifications are for 1+0 configurations and optimum conditions and may be affected by location, environment, and other operating conditions.
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