

Microwave: Sierra Digital Series

Applications

- ▲ Point to Point medium haul, light density LAN extensions.
- ▲ Extending communications service, including local area network and PBX extensions in a single radio link.

MODEL 2351S (SYNTHESIZED)

21.2-23.6 GHz MILLIMETER
WAVE RADIO LINK

*10 Mbps: Ethernet, Ethernet
plus 1 or 2 T1 or E1*



Features & Benefits

- ▲ Flexible - Can be configured for ETHERNET only, ETHERNET+T1/E1, or ETHERNET+2T1/2E1.
- ▲ Operating frequency tunable at the Interface Unit with thumbwheel switches.
- ▲ Optional Output Power Control at the Interface Unit with thumbwheel switch.
- ▲ One year warranty - Low parts count, highly derated solid state devices make for extremely high MTBF.
- ▲ Easy installation - special mounts enable simplified, rapid installation.

Description

The 2351S series synthesized digital millimeter wave radio is a simple, low cost, 10 Mb/s, alternative to burying fiber.

For all your ETHERNET needs, the 2351S millimeter wave link affords a low cost full 10 Mb/s radio solution. The 2351S digital radio, with its included switch selectable AUI/DB15 or UTP/RJ45 interface, will connect directly into your computer or 802.3 device such as a Router, Bridge, or Repeater, because the transceiver unit is built into the radio itself. The UTP interface facilitates full duplex operation. Optional separate T1/E1 capability (1T1, 1E1, 2T1, or 2E1) is available to add low cost voice service to the same radio link.

Three units make up the 2351S system:

- A weatherproof outdoor transmitter/receiver unit including integral 12" antennas.
- Also available in separate box for use with external antennas.
- An Indoor Interface unit containing power supplies, ETHERNET transceiver, and optional T1/E1 circuitry.

Technical Specifications

TECHNICAL SUMMARY

Frequency Range	21.2 to 23.6 GHz
Standard TX/RX spacing	1200 MHz
Allocated R.F. Channel Bandwidth	50 MHz
Occupied Bandwidth	28 MHz
Modulation type	2-level FSK (FM)

STATUS AND DIAGNOSTICS

LED Status Indicators	Primary power, Link continuity
LED Alarm indicators	AGC Alarm, Tx Alarm, Rx Alarm, Frequency command error
Alignment Aids	Outdoor Unit: AGC Test Points Indoor Unit: AGC Level Meter



ORDERING INFORMATION

Synthesized LAN Radio
Model 2351S

OPTIONS

(Consult the Factory)

Note that standard models will accept input voltages from 93 to 265 VAC, 50/60 Hz.

1. Add T1 Capability (LAN+T1)
2. Add E1 Capability (LAN+E1)
6. + or - 24 VDC
7. + or - 48 VDC
10. 24" External Antennas
11. Flex guide Sections to connect Antennas to RF Heads
12. Output Power Control
17. Arctic Mod to Operate Down to -45 C (Increases Power Consumption)
18. Add 2T1 Capability (LAN+2T1)
19. Add 2E1 Capability (LAN+2E1)

** In the US, operation with 12 Inch antennas is restricted to Pair numbers D (21.825/23.025), T (21.875/23.075), G (21.925/23.125), and E (21.975/23.175).

More Specifications for 2351S*

TRANSMITTER CHARACTERISTICS

RF Source	Oscillator/ Multiplier/ Amplifier Type
Guaranteed Power Output	+17 dBm (minimum)
Power Control Option	7 steps down from max power out
Frequency Stability (-30° to +70° C)	± 0.001%
Tuning Range	Covers full band with Two (2) sets of units (One set covers upper half, one set covers lower half)
	In response to interference, radios may be tuned in 5 MHz increments at the Control Unit.

RECEIVER CHARACTERISTICS

Type - Dual Conversion Superhetrodyne	2500 & 70 MHz
Noise Figure (System)	5.5 dB (typical)
Sensitivity	
For 10-6 BER operating point (LAN Only)	-75 dBm
For 10-3 BER operating point (LAN + T1/E1)	-78 dBm
Maximum receiver input	-15 dBm
(Damage will occur at +5 dBm)	

12" ANTENNA CHARACTERISTICS

Type	Parabolic
Diameter	12.5 inches (31.8 cm)
Polarization	Linear
Gain (22.4 GHz)	35 dB
Front to back ratio	42 dB
Beamwidth (3 dB)	3.2°

INTERFACE PARAMETERS

Ethernet Specification (direct)	IEEE 802.3
Protocols passed	IEEE 802.3

ENVIRONMENTAL CHARACTERISTICS

	OUTDOOR UNIT	INDOOR UNIT
Ambient temperature range	-30° to +70° C	0° to +50° C
Storage & transportation	-40° to +80° C	-40° to +60° C
Humidity	up to 100% (non-condensing)	up to 95% at +50° (non-condensing)

INPUT VOLTAGE REQUIREMENTS

Power input	93 - 265 VAC
Brown-out voltage	90 VAC
Line frequency	50/60 Hz
A six foot long power cord with a 3-prong plug is provided with the indoor unit.	

TRANSMISSION DATA

System Gain	
Guaranteed for 10 ⁻⁶ BER operating point	92 dB (LAN Only)
Unfaded BER	10 ⁻¹²

POWER CONSUMPTION

Total power required per Terminal	50 Watts Maximum (100 Watts Maximum for both ends of the link)
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FCC INFORMATION

FCC rules part number	101
Frequency range	21.2 - 23.6 GHz**
Emission Designator	42M0F7D
Frequency tolerance	± 0.001%
FCC Maximum power output	0.10 watts

SIZE AND WEIGHT

	High	Deep	Wide	Wt
Outdoor RF Unit with Integrated 12" antennas (excluding mount)	15"	12"	15"	15 lb.
Outdoor RF Unit for use with external antennas (excluding mount)	10"	4.5"	8"	15 lb.
Indoor Interface Unit	19" Rack, 2U mounting space (3.5" high)			

INTERCONNECT CABLES & CONNECTORS

Cabling Between RF Head and Interface Unit

0' to 1000'	One single 50 Ohm coaxial cable (Belden 9913 or equivalent.)
Coaxial connectors	Type N
Waveguide Flange	UG 595/U (for connection to external antennas)
Ethernet conn (switch selectable)	RJ45 (UTP) or DB15 (AUI)
T1 Connectors	RJ45
E1 Connectors	BNC

FREQUENCIES

The lower half of the band is covered by one pair of units and the upper half of the band is covered by a second pair of units. Therefore, to spare all possible frequencies would require four (4) different RF Heads.

Specifications are subject to change without notice.

For more information on Telenetics' 2351 Series and other wireless products and services, contact us at:

**949-455-4000 or visit
www.telenetics.com**