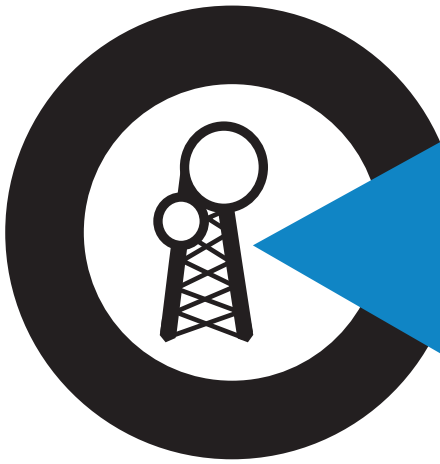




StarLink

Microwave Backhaul Radio Link



StarLink is a high-capacity microwave IP radio ideally suited to a broad range of backhaul applications for Mobile and ISP Networks.

INTRODUCTION

The **StarLink** is a versatile microwave, wireless point-to-point IP backhaul solution.

StarLink is available in selected licensed and license-exempt frequency bands between 6 GHz and 24 GHz (including the 17 and 24 GHz unlicensed bands).

Optimised for cost-effective IP backhaul, the StarLink Microwave provides up to 400 Mbps Full Duplex throughput with low latency.

The capacity and channel bandwidth are software-adjustable between 14 and 56 MHz with hitless adaptive modulation from QPSK to 1024QAM.

The StarLink is designed to meet service providers' stringent requirements for a high-capacity, low cost of ownership carrier-grade backhaul solution.

FEATURES

- ▶ Zero footprint, all Outdoor solution with integrated antenna.
- ▶ Available in frequency bands from 6 to 24 GHz
- ▶ Up to 400 Mbps full duplex in 56 MHz bandwidth with Adaptive coding and Modulation (HAACM)
- ▶ Scalable channel bandwidth: 14 to 56 MHz with flexible modulation (QPSK-1024QAM)
- ▶ Network Synchronization with SyncE
- ▶ PoE and coaxial (N-type F) power connection
- ▶ Jumbo frame support up to 9600 bytes, layer-2 switching, auto MDI/MDXI, VLAN, QoS, QinQ, STP/RSTP, RLS
- ▶ SNMP as well as Local management capability
- ▶ RF and baseband loopback

License-Exempt

Traditionally 17GHz has been sold as a software licensed product; in other words to get the full use of the product a license is required for each upgrade or step.

The Starlink however is not sold in that manner. When purchased, a client will have complete access to full capabilities of the software; no limitations are coded-in that need to be unlocked at a later stage. Only the actual installation environment impacts the performance of the link.

A set of variables are looked at namely distance of the link, expected/required uptime and availability of the connection and size of antenna used with the radio.

A final item we look at to give accurate link-plans are rain patterns for the region to determine the effect on the link during bad weather.

Licensed

For longer links, higher performance and tolerance to weather conditions, the next logical step is going the route of Licensed Band equipment.

Up until recently, the regulated Licensed Band frequencies have been limited and quietly reserved for the bigger corporates and operators.

However, with the shift to a more open regulatory environment and lobbying of private organisations, these frequencies have become more readily available.

At a very attractive cost one can have a legal, licensed, long distance link on a private frequency.

AFREN is positioned to provide the StarLink equipment in the 7GHz (up to 70km) and 11Ghz (up to 45km) licensed bands as well.

But that's not all – we will facilitate the entire registration process on your behalf and deliver equipment along with supporting spectrum registration certification from ICASA.

High Capacity IP backhaul radio with up to 400 Mbps throughput, making it the perfect network connectivity tool.

SPECIFICATIONS

Transmitter Characteristics

Freq Band	6,5 GHz	7/ 8 GHz	11 GHz	13/ 15 GHz	17 /24 GHz	18 / 23 GHz
Modulation	Level (dBm)	Level (dBm)	Level (dBm)	Level (dBm)	Level (dBm)	Level (dBm)
QPSK	25	25	23	23	-5	21
16QAM	25	25	21	21	-6	20
32QAM	25	25	20	20	-7	19
64QAM	25	25	19	19	-8	18
128QAM	25	25	18	18	-9	17
256QAM	25	25	18	18	-10	17
512QAM	24	24	17	17	-10	16
1024QAM	23	23	16	16	-10	15
Flange	UBR84	UBR84	UBR100	UBR140	UBR220	UBR220

Receiver Sensitivity 10⁻⁶ (dBm) and Throughput

Freq Band	6,5 GHz		7/ 8 GHz		11 GHz		13/ 15 GHz		17 /24 GHz		18 / 23 GHz	
Channel	14 MHz		28 MHz		40 MHz		28 MHz		40 MHz		28 MHz	
Modulation	RSL	Mb/s	RSL	Mb/s	RSL	Mb/s	RSL	Mb/s	RSL	Mb/s	RSL	Mb/s
QSPK	-86.1	22	-83.7	44	-81.6	63	-83.1	44	-82.3	63	-82.7	44
16QAM	-80.3	44	-77.3	88	-75.3	126	-76.8	88	-75.9	126	-76.4	88
32QAM	-76.1	55	-74.5	110	-72.5	157	-74.0	110	-72.9	157	-73.6	110
64QAM	-73.3	66	-71.5	132	-69.7	189	-71.2	132	-70.0	189	-70.8	132
128QAM	-70.6	77	-68.5	154	-66.5	220	-68.0	154	-67.0	220	-67.6	154
256QAM	-67.9	88	-65.4	176	-63.6	251	-65.1	176	-64.0	251	-64.7	176
512QAM	-64.9	99	-62.4	198	-60.4	283	-61.9	198	-61.0	283	-61.5	198
1024QAM	-61.1	110	-57.9	220	-55.9	314	-57.4	220	-57.4	314	-57.0	220

Ethernet

Switch type	GE Layer 2	QoS	802.1p
Max frame size	9216 bytes	QoS queuing	Yes
MAC table	2k entries, auto learning &	VLAN support	802.1Q, QinQ
Packet buffer	128kb; non-blocking store	Spanning tree protocol	802.1D-1998 STP&RSTP
Flow control	802.3x	Synchronization	SyncE

Network Management

SNMP	SNMP traps, MIB, SNMP v1/v2c
EMS	Web-based http, Telnet, FTP, SNMP

Ports

Gigabit Ethernet	Full-duplex or half-duplex electrical (RJ45) and optical GE (SFP)
Service ports	BNC for RSSI; Ethernet RJ45 (in-band) for Management

Power and Environment

Power	-48V ± 20%; PoE (Coaxial option)
Power Consumption	<35W
Ambient Temperature	-35~ +55°C
Weight & Dimension (kg/mm)	5 / 315x265x130 without antenna
Humidity / IP Rating	All weather / IP67

*Specifications subject to change without notice

APPLICATIONS

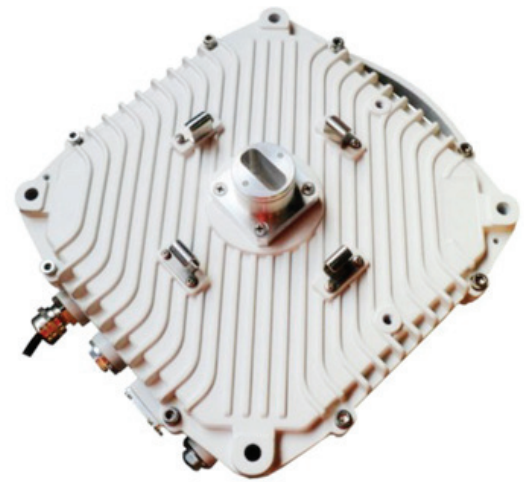
▶ **Cellular Backhaul** - StarLink is a perfect fit for 3G/LTE/WiMAX base station backhaul as a substitute for optical fiber and FSO, ideal for new all-packet base stations and caters to various connection needs such as voice, data management and control.

With SyncE synchronization, StarLink could meet any RAN network requirement.

▶ **Broadband Access** - StarLink is an affordable medium capacity radio solution for enterprises that need private lines and broadband Ethernet traffic.

It offers solutions with a fine combination of cost-effectiveness & short commission time for the following applications:

- ▶ DSLAM backhaul
- ▶ No right-of-way
- ▶ Extending network from a fiber POP
- ▶ Private Communication networks.



▶ **ISP Backhaul** - StarLink allows ISPs to quickly establish backhaul without quality compromises.

ISPs can grow their profits by delivering services with guaranteed SLAs and reaching distant clients from their PoP using radios with similar cost - either licensed frequencies or license-exempt frequencies.

Supported by



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