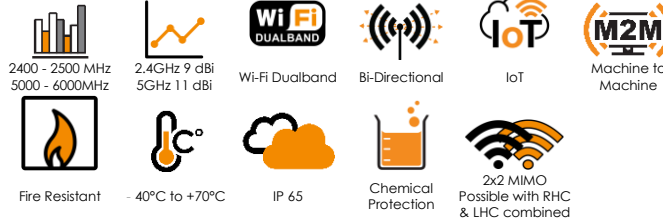


ANTENNAS | HELI-22 SERIES

DUAL FREQUENCY BI-DIRECTIONAL MINE & TUNNEL ANTENNA

BI-DIRECTIONAL 2400–2500 MHz & 5000–6000 MHz CIRCULAR POLARISED ANTENNA



- **Circular Polarised HELI antenna provides enhanced signal propagation and connection stability within a tunnel**
- **Left Hand Circular (LHC) & Right Hand Circular (RHC) Polarised options available**
- **Bi-directional – radiates in both directions in a tunnel**
- **Ruggedized & water ingress protected**
- **Ideal for Mining & Tunnel M2M and IoT deployments**



APPLICATION AREAS

Product Overview

The HELI-22 forms part of a series of MiniHELI antennas. These antennas are only mini in size relative to their bigger brothers, the HELI-3, HELI-4 & HELI-8, but offer medium to high gain, which makes these antennas ideal for mining tunnels where IoT/M2M connectivity is deployed and can also be used for coverage into the stopes.

The HELI-22 is a set of dual 2.4GHz and 5GHz antennas, radiating in both directions (i.e. bi-directional), which make them ideal for the coverage of both 2.4GHz and 5GHz in mining and other type of tunnels. These antennas are typically used for the deployment of IoT within the tunnel to provide telemetry and mine automation. The Left Hand Circular (LHC) and Right Hand Circular (RHC) polarised antenna elements provide optimal decorrelation within a MIMO deployment when using the BRKT-45, resulting in the best of the two worlds; decorrelation due to the polarisation difference and spatial diversity to enhance MIMO performance and RF reliability to service the most severe connectivity within a demanding mining tunnel. The dual-band Wi-Fi connection propagates around tunnel bends in a Non-Line Of Sight scenario and provides immunity to many Wi-Fi signal disrupting objects such as trains and drilling machinery which appear to obscure the tunnel.

Features

- Four port 2.4GHz and 5GHz antenna
- This antenna is especially designed for mining and other types of tunnels where rapid extension of network is required
- Bi-directional – radiates in both directions in a tunnel
- Left & Right Hand Circular Polarised

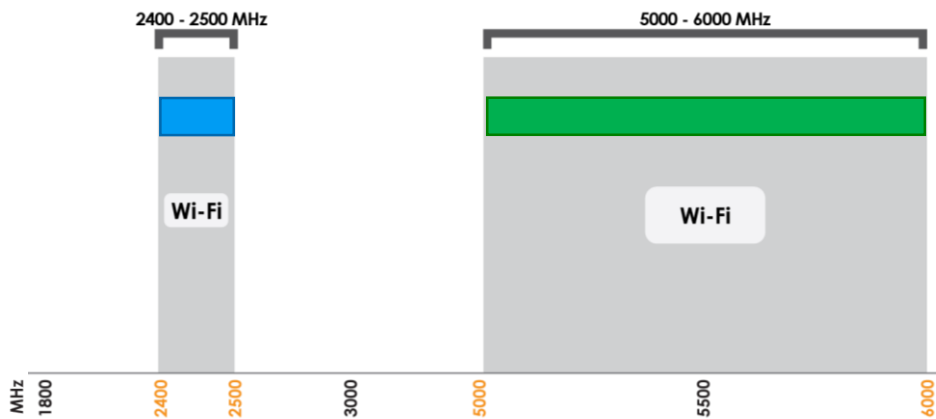
Application Areas

- Supplementing fibre / leaky feeder cable "Hotspots" to areas to enhance mobility or extend networks to inaccessible areas
- Underground telemetry and automation
- Creating of complete underground in tunnel wide data networks and internet/LTE connectivity
- Seamless connection to personnel using cellular phones and smart devices and tablets



Frequency Bands

The HELI-22 is a Wi-Fi / ISM antenna that works from 2400 – 2500 & 5000 - 6000 MHz



Wi-Fi Indicates Port 1: 2.4GHz Wi-Fi / ISM Band

Wi-Fi Indicates Port 2: 5GHz Wi-Fi / ISM Band

Antenna Overview

		
Port	1&3	2&4
Frequency Bands	2400 MHz - 2500 MHz	5000 MHz - 6000 MHz
Peak Gain	9 dBi	11.0 dBi
Coax Cable Type	RG-58	RG-58
Coax Cable Length	350mm	350mm
Connector Type	N-Type Male	N-Type Male

Electrical Specifications

Frequency bands:	2400 MHz - 2500 MHz 5000 MHz - 6000 MHz
Gain (max):	9.0 dBi for 2400 MHz – 2500 MHz 11.0 dBi for 5000 MHz - 6000 MHz
VSWR:	<1.5:1 Over 90% of the bands
Feed power handling:	30 W
Input impedance:	50 Ohm (nominal)
Polarisation:	Circular Polarised (LHC and RHC)
Coax cable loss:	0.86 dB/m @ 2.4 GHz 2.10 dB/m @ 5.8 GHz
DC short:	N/A

Coax Cable & Connector Type

Cable length:	350 mm
Coax cable type:	RG 58
Connector type:	N-Type (Male)

**The coax cable & connector is factory mounted to the antenna*

Product Box Contents

Antenna:	A-HELI-0019-V2-01-R A-HELI-0019-V2-01-L
Mounting bracket:	A-BRKT-045-V2-01

Ordering Information

Commercial name:	HELI-22
Order product code:	A-HELI-0022-V2-01
EAN number:	6009710920060

Mechanical Specifications

Product dimensions	603 mm x 415 mm x 266 mm
Packaged dimensions:	1210mm x 315mm x 185mm
Weight:	5.6 kg
Packaged weight:	5.9 kg
Radome material:	ABS & PVC
Radome colour:	Grey
Mounting Type:	Ceiling mounted

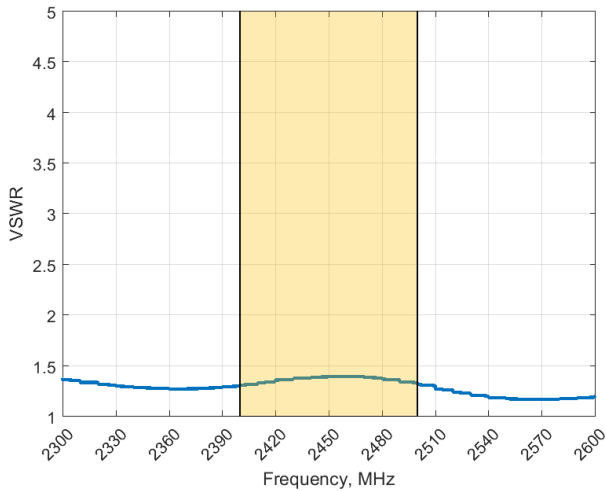
Environmental Specifications, Certification & Approvals

Wind Survival:	<120 km/h
Temperature Range (Operating):	-40°C to +70°C
Environmental Conditions:	Outdoor/Indoor
Water ingress protection ratio/standard:	IP 65
Salt Spray:	MIL-STD 810F/ASTM B117
Operating Relative Humidity:	Up to 98%
Storage Humidity:	5% to 95% - non-condensing
Storage Temperature:	-40°C to +70°C
Enclosure Flammability Rating:	UL 94-HB
Impact resistance:	IK 08
Product Safety & Environmental:	Complies with CE and RoHS standards

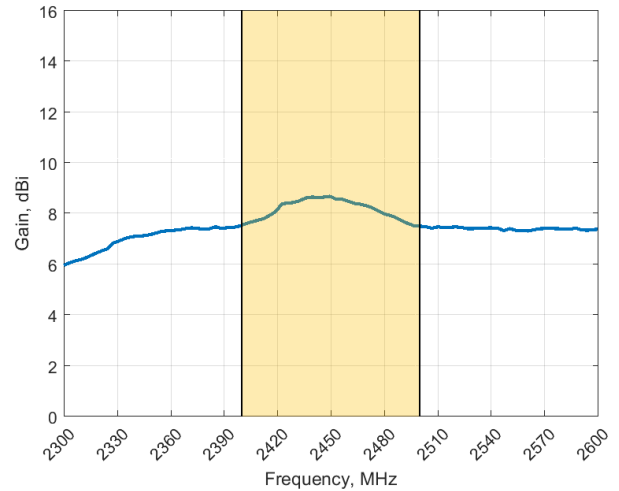


Antenna Performance Plots

VSWR 2400-2500 MHz



GAIN 2400-2500 MHz (EXCLUDING CABLE LOSS)



Voltage Standing Wave Ratio (VSWR)

VSWR is a measure of how efficiently radio-frequency power is transmitted from a power source, through a transmission line, into a load. In an ideal system, 100% of the energy is transmitted which corresponds to a VSWR of 1:1.

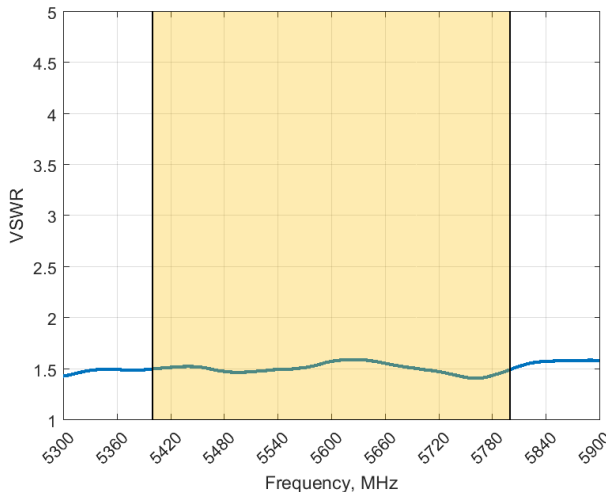
The HELI-22 delivers superior performance across all bands with a VSWR to 1.5:1 or better across 90% of the bands.

Gain* in dBi

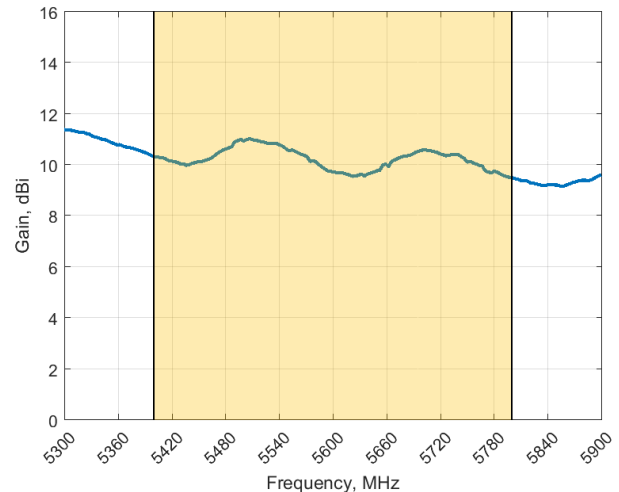
9 dBi is the peak gain from 2400 – 2500 MHz

**Antenna gain measured with circular polarised standard antenna*

VSWR 5000-6000 MHz



GAIN 5000-6000 MHz (EXCLUDING CABLE LOSS)



Voltage Standing Wave Ratio (VSWR)

VSWR is a measure of how efficiently radio-frequency power is transmitted from a power source, through a transmission line, into a load. In an ideal system, 100% of the energy is transmitted which corresponds to a VSWR of 1:1.

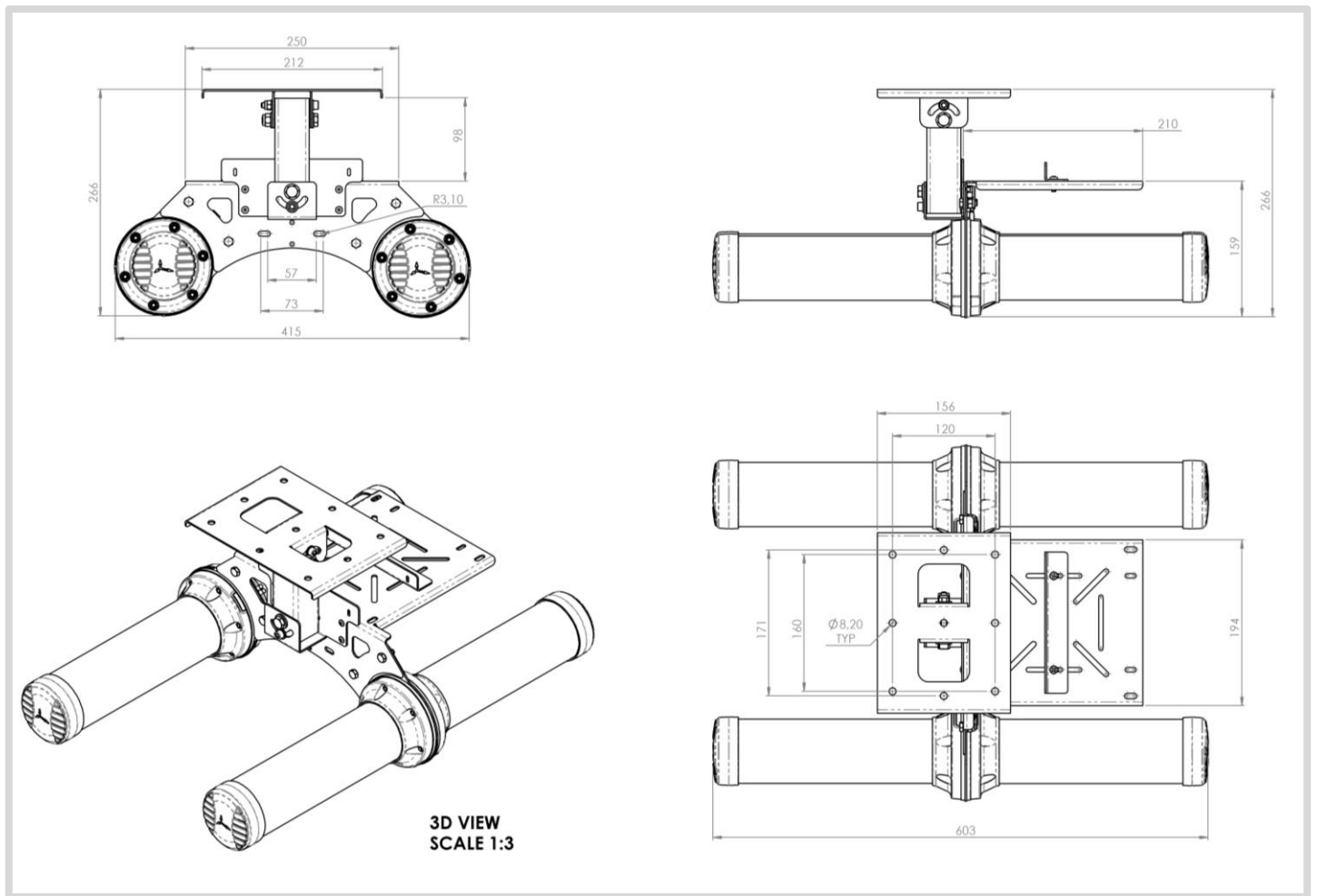
The HELI-22 delivers superior performance across all bands with a VSWR of 1.5:1 or better across 90% of the bands.

Gain* in dBi

11.0 dBi is the peak gain from 5000 – 6000 MHz

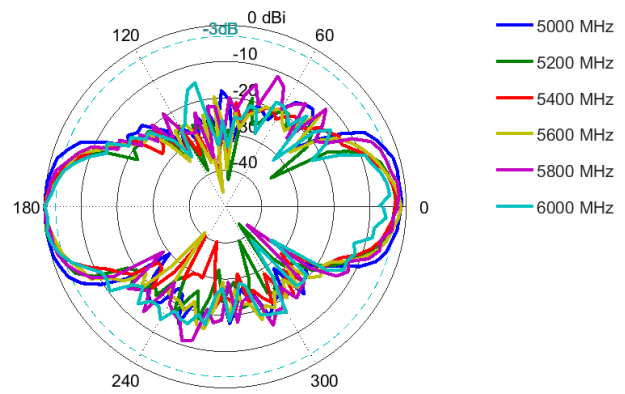
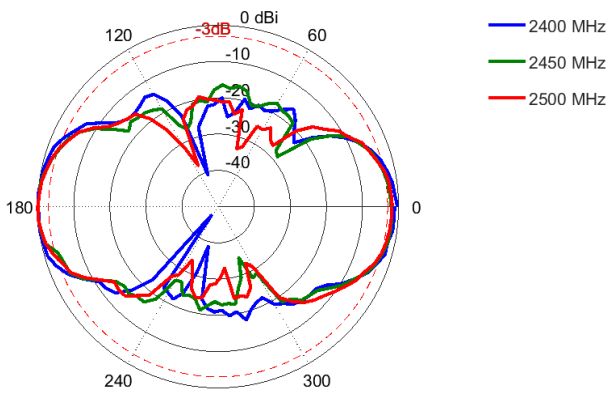
**Antenna gain measured with circular polarised standard antenna*

Technical Drawings

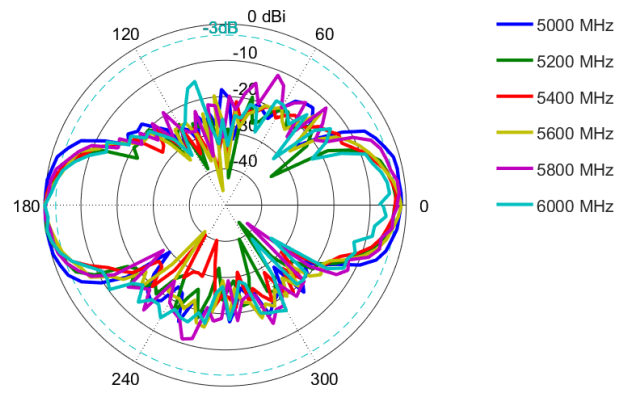
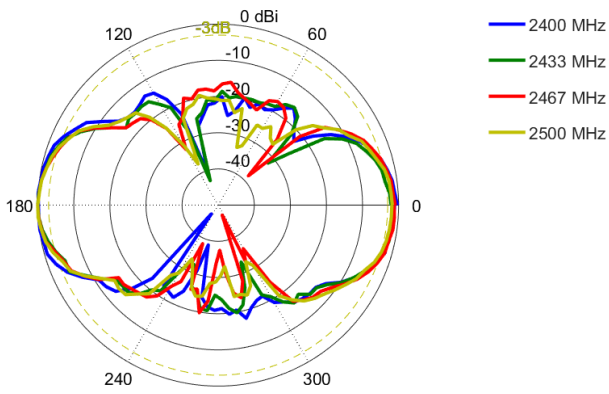


Radiation Patterns

Elevation Port 1 & 3: 2400 – 2500MHz | Elevation Port 2 & 4: 5000 – 6000 MHz



Azimuth Port 1 & 3: 2400 – 2500MHz | Azimuth Port 2 & 4: 5000 – 6000 MHz



Antenna Assembly Options



Complete assemblies available with antennas and brackets:

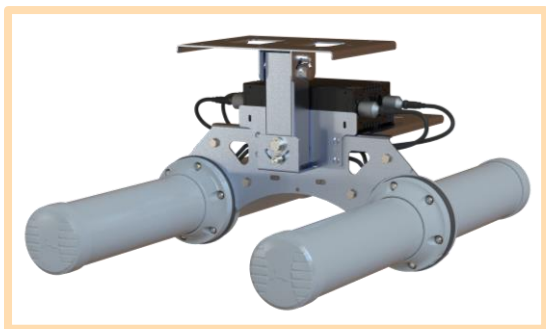
A-HELI-0022-V2-01 consists of:

- A-HELI-0019-V2-01-L _ Left Hand, Circular polarised bi-directional antenna
- A-HELI-0019-V2-01-R _ Right Hand, Circular polarised bi-directional antenna
- A-BRKT-045-V2-01 _ Ceiling Mount, swivel bracket

A-HELI-0022-V2-02 consists of:

- A-HELI-0019-V2-01-L _ Left Hand, Circular polarised bi-directional antenna
- A-HELI-0019-V2-01-R _ Right Hand, Circular polarised bi-directional antenna
- A-BRKT-045-V2-01 _ Ceiling Mount, swivel bracket
- A-BRKT-047-V1-01 _ Mine roof bolt attachment accessory

Mounting Options



Ceiling Mount

Multi directional swivel bracket for mounting the antenna to a ceiling.

This option uses A-BRKT-045-V2-01.



Mounting Rod

Ceiling 20mm rod mounting bracket attachment to use with bracket 45 for holding Heli-13 right hand circular and left hand circular polarised antennas.

This option uses A-BRKT-047-V1-01.

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