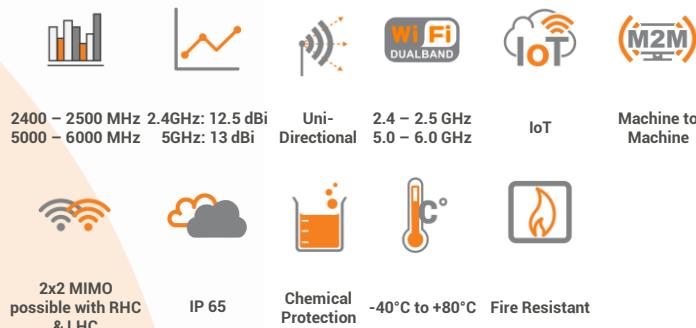


ANTENNAS | HELI-13 SERIES

CIRCULAR POLARISED, DIRECTIONAL MINE/TUNNEL ANTENNA

Dual-band Wi-Fi; 2400 – 2500 MHz, 12.5 dBi; 5000 – 6000 MHz, 13 dBi



- 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
- Uni-directional – radiates in one direction in a tunnel
- Ruggedized water and dust ingress protected (IP 65)
- Ideal for Mining & Tunnel M2M and IoT deployments

APPLICATION AREAS



Mining



Tunnelling



Mining and Surface

Product Overview

The HELI-13 forms part of a series of Mini-HELI 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-13 is a set of dual 2.4GHz and 5GHz antennas, radiating in one direction (i.e. Uni-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. These antennas are available in both Left-hand Circular (LHC) & Right-hand Circular (RHC) polarised antenna elements to 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

- Dual 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
- Uni-directional – radiates in one direction in a tunnel
- Left & Right-hand Circular Polarised available (for MIMO)
- Intrinsically safe version available on request

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



2x HELI-13 antennas mounted on the BRKT-45 for MIMO application

HELI-13

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Product Specifications may change without prior notice
Revised: September 2022



Frequency Bands

The HELI-13 is a Wi-Fi / ISM antenna that works from | 2400 – 2500 MHz | and | 5000 – 6000 MHz |



Indicates the Wi-Fi bands on which HELI-13 works

Antenna Overview

| Port | 1 | 2 |
|-------------------|-----------------|-----------------|
| Frequency Bands | 2400 – 2500 MHz | 5000 – 6000 MHz |
| Peak Gain | 12.5 dBi | 13 dBi |
| Coax Cable Type | RG-141 | RG-141 |
| Coax Cable Length | 400mm | 400mm |
| Connector Type | N-Type (M) | N-Type (M) |

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

HELI-13

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Electrical Specification

| | |
|----------------------|---|
| Frequency Bands: | 2400 – 2500 MHz |
| | 5000 – 6000 MHz |
| Gain (Max): | 12.5 dBi @ 2400 MHz – 2500 MHz |
| | 13.0 dBi @ 5000 MHz – 6000 MHz |
| VSWR: | <1.5:1 |
| Feed Power Handling: | 30 W |
| Input Impedance: | 50 Ohm (nominal) |
| Polarisation: | Circular Polarised (LHC or RHC) |
| Coax Cable Loss: | 0.84 dB /m @ 2.4 GHz 1.47 dB/m @ 6 GHz |
| DC Short: | N/A |

Product Box Content

| | |
|----------|-------------------|
| Antenna: | A-HELI-0013-V3-01 |
|----------|-------------------|

Ordering Information

| | |
|---------------------------------------|---------------------|
| Commercial name: | HELI-13 |
| a) Right-hand Circular Version | |
| Order product code: | A-HELI-0013-V3-01-R |
| EAN number: | 6009710921364 |
| b) Left-hand Circular Version | |
| Order product code: | A-HELI-0013-V3-01-L |
| EAN number: | 6009710921357 |

Note: For MIMO application, order both Right-Hand Circular and Left-Hand Circular antennas.

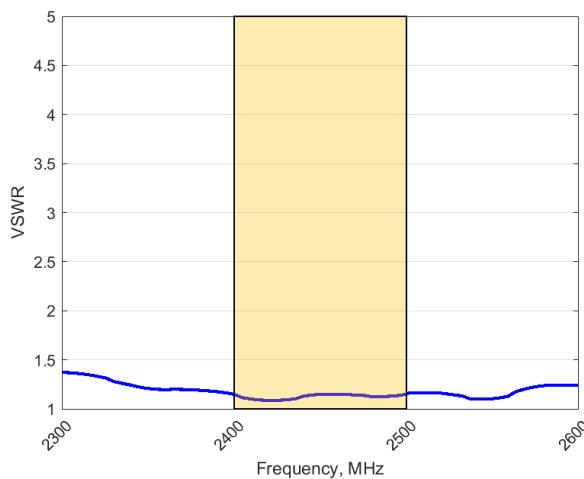
Mechanical Specification

| | |
|----------------------|--------------------------|
| Product Dimensions: | 318 mm x 143 mm x 116 mm |
| Packaged Dimensions: | 360 mm x 165 mm x 140 mm |
| Weight: | 0.35 kg |
| Packaged Weight: | 0.85 kg |
| Radome Material: | UV Stable ASA |
| Radome Colour: | Grey Pantone-424C |
| Mounting Type: | Ceiling mounted |

Environmental Specifications, Certification & Approvals

| | |
|--|-------------------------------------|
| Wind Survival: | ≤120 km/h |
| Temperature Range (Operating): | -40°C to +80°C |
| Environmental Conditions: | Outdoor/Indoor |
| Water Ingress Protection Ratio/Standard: | IP 65 |
| Salt Spray: | MIL-STD 810G/ASTM B117 |
| Operating Relative Humidity: | Up to 98% |
| Storage Humidity: | 5% to 95% - non-condensing |
| Storage Temperature: | -40°C to +80°C |
| Enclosure Flammability Rating: | UL 94-HB |
| Impact Resistance: | IK 08 |
| Product Safety & Environmental: | Complies with CE and RoHS standards |

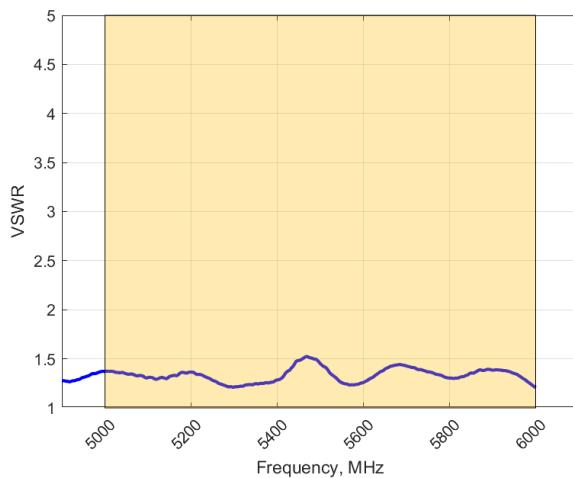


Antenna Performance Plots
VSWR: 2400 – 2500 MHz

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-13 delivers superior performance across all bands with a VSWR of <1.5:1 or better.

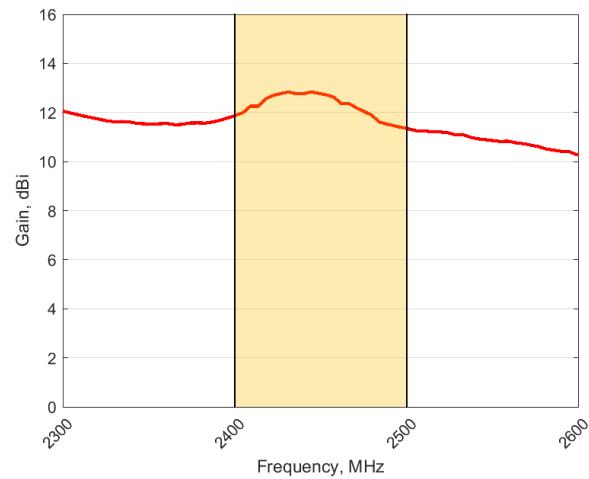
*VSWR measured with 400mm low loss cable

VSWR: 5000 – 6000 MHz

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.

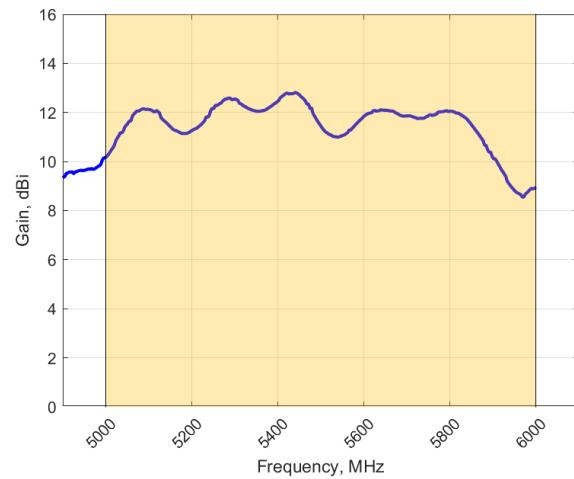
The HELI-13 delivers superior performance across all bands with a VSWR of <1.5:1.

*VSWR measured with 400mm low loss cable

GAIN (EXCLUDING CABLE LOSS): 2400 – 2500 MHz

Gain* in dBi

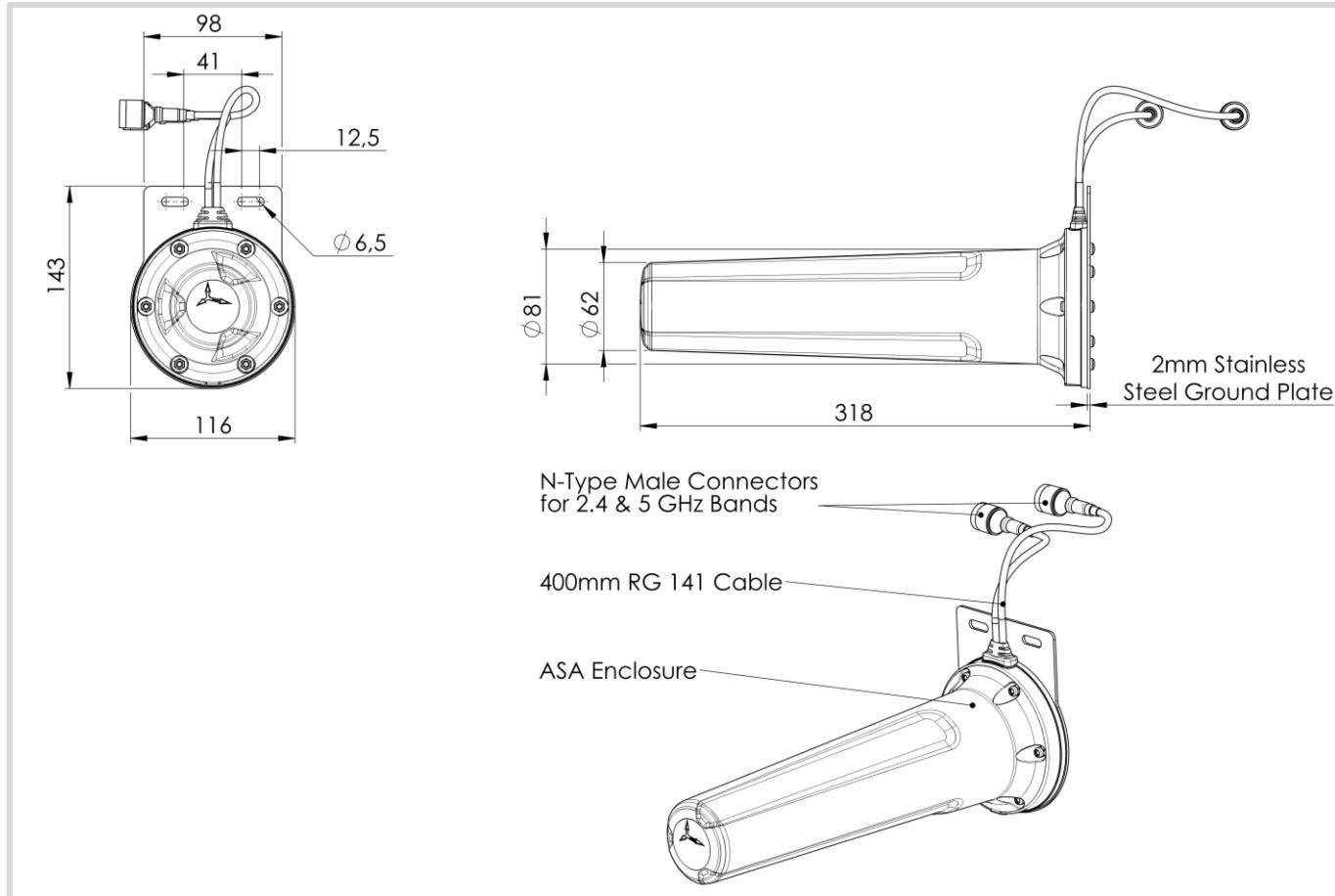
12.5 dBi is the peak gain across all bands from 2400 – 2500 MHz

*Antenna gain measured with circular polarised standard antenna

GAIN (EXCLUDING CABLE LOSS): 5000 – 6000 MHz

Gain* in dBi

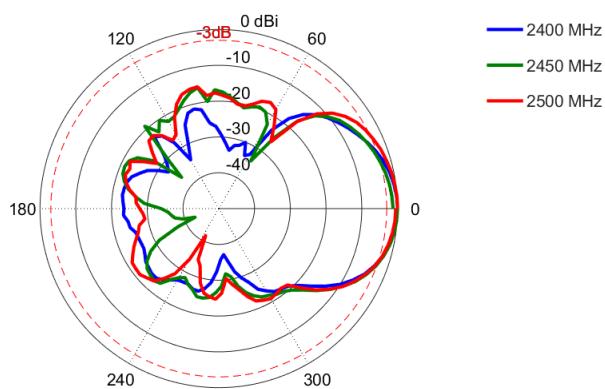
13 dBi is the peak gain across all bands from 5000 – 6000 MHz

*Antenna gain measured with circular polarised standard antenna

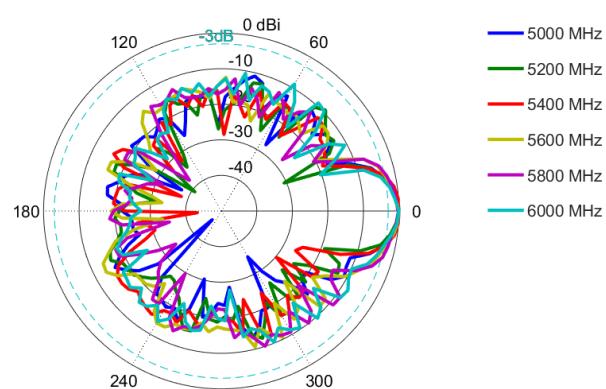
Technical Drawings

Radiation Patterns

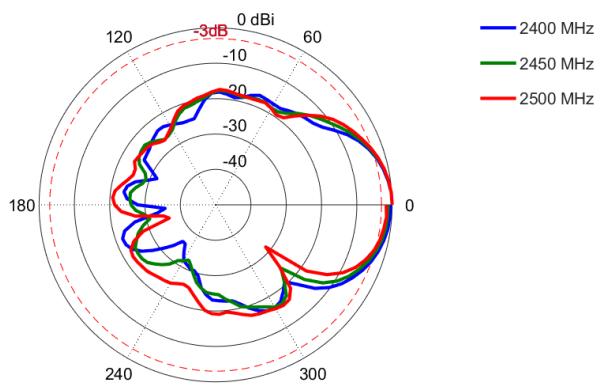
Azimuth Port 1: 2400 – 2500 MHz



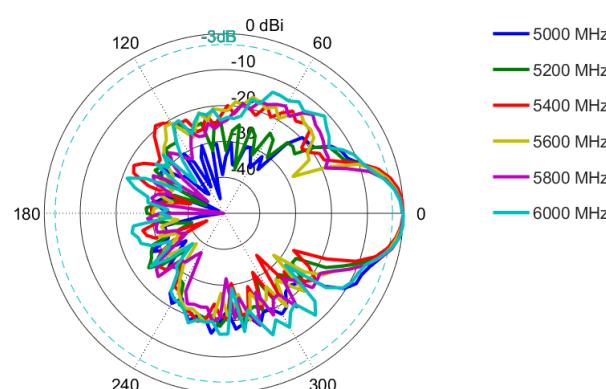
Azimuth Port 2: 5000 – 6000 MHz



Elevation Port 1: 2400 – 2500 MHz



Elevation Port 2: 5000 – 6000 MHz



Antenna Assembly Options



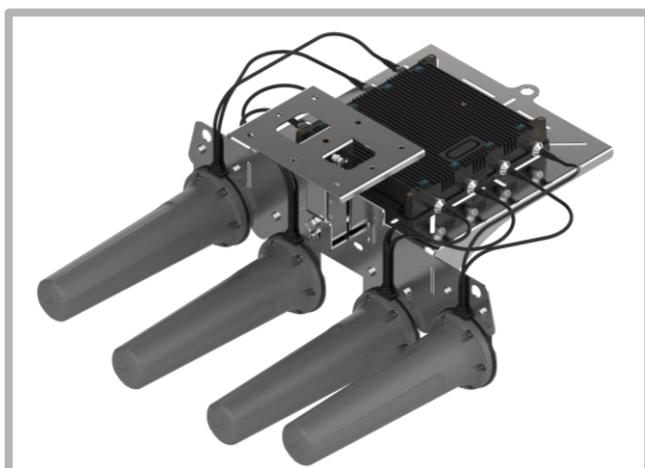
1. 2 X 2 MIMO Application: Complete assemblies available with antennas and brackets:

A-HELI-0021-V3-01 consists of:

- A-HELI-0013-V3-01-L _ Left-hand, Circular polarised uni-directional antenna
- A-HELI-0013-V3-01-R _ Right-hand, Circular polarised uni-directional antenna
- A-BRKT-045-V2-01 _ Ceiling Mount, swivel bracket

A-HELI-0021-V3-02 consists of:

- A-HELI-0013-V3-01-L _ Left-hand, Circular polarised uni-directional antenna
- A-HELI-0013-V3-01-R _ Right-hand, Circular polarised uni-directional antenna
- A-BRKT-045-V2-01 _ Ceiling Mount, swivel bracket
- A-BRKT-047-V2-01 _ Mine roof bolt attachment accessory



2. 4 X 4 MIMO Application: Complete assemblies available with antennas and brackets:

A-HELI-0041-V1-01 consists of:

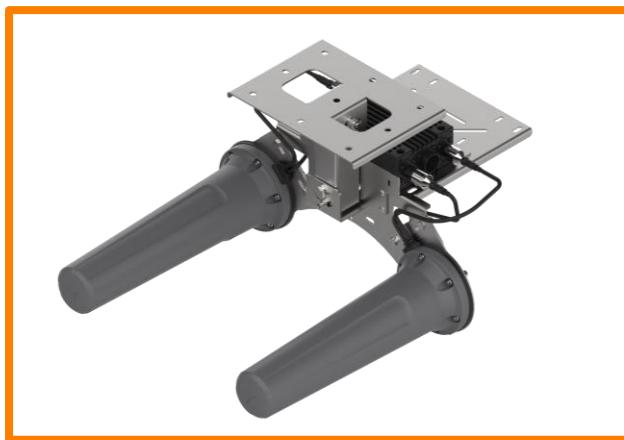
- 2 x A-HELI-0013-V3-01-L _ Left-hand, Circular polarised uni-directional antenna
- 2 x A-HELI-0013-V3-01-R _ Right-hand, Circular polarised uni-directional antenna
- A-BRKT-046-V2-01 _ Ceiling Mount, swivel bracket

A-HELI-0041-V1-02 consists of:

- 2 x A-HELI-0013-V3-01-L _ Left-hand, Circular polarised uni-directional antenna
- 2 x A-HELI-0013-V3-01-R _ Right-hand, Circular polarised uni-directional antenna
- A-BRKT-046-V2-01 _ Ceiling Mount, swivel bracket
- A-BRKT-047-V2-01 _ Mine roof bolt attachment accessory

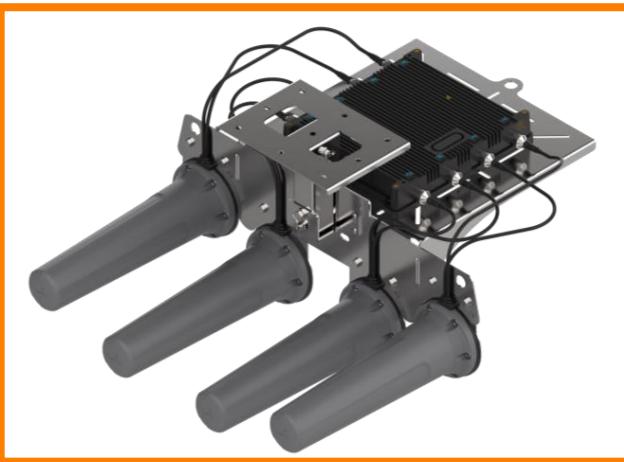
Mounting Options**Base Mount**

The antenna can be fastened directly using the two slots on its base, via an L-Bracket to a pipe or directly to another surface.

**Ceiling Mount (MIMO) - Optional**

An optional multi-directional swivel bracket is available for mounting 2 x miniHELI antennas (right-hand circular and left-hand circular polarised antennas) to a ceiling for MIMO application.

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

**Ceiling Mount (MIMO) - Optional**

An optional multi-directional swivel bracket is available for mounting 4 x miniHELI antennas (2 x right-hand circular and 2 x left-hand circular polarised antennas) to a ceiling for MIMO application.

This option uses A-BRKT-046-V2-01.

**Roof Bolt Mount (MIMO) - Optional**

This optional 20mm roof bolt mounting bracket attachment is used in conjunction with BRKT-45 for mounting to standard mine roof bolts.

This option uses A-BRKT-047-V2-01.

**Roof Bolt Mount (MIMO) - Optional**

This optional 20mm roof bolt mounting bracket attachment is used in conjunction with BRKT-46 for mounting to standard mine roof bolts.

This option uses A-BRKT-047-V2-01.

Additional Accessories



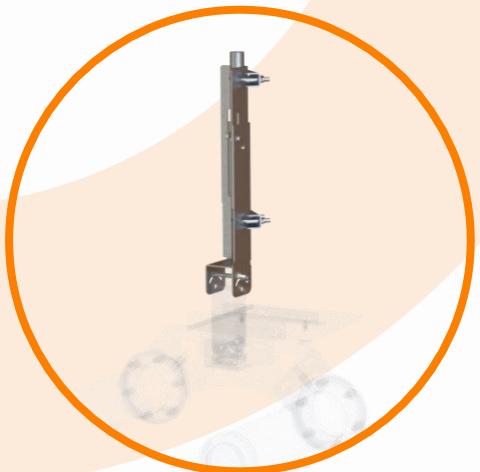
A – BRKT – 045 -V2 - 01

Ceiling mounting bracket for holding miniHELI right-hand and left-hand circular polarised antennas.



A – BRKT – 046 -V2 - 01

Mining tunnel roof mount bracket for 4x mini-HELI antennas.



A – BRKT – 047 -V2 - 01

Ceiling 20mm Rod mounting bracket attachment to use with BRKT-45 and BRKT-46.

See accessories technical specifications on www.poynting.tech

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