

# RAy Microwave Link

## RAy Microwave Link

RAy is a high-speed point-to-point microwave link, ideal for establishing robust links in the most challenging conditions.

This Full Outdoor Software Defined Radio with Linux OS, is designed for high performance links with maximum reliability, exceptional system gain and resistance to disturbances. All relevant state-of-the-art concepts have been carefully implemented without compromise.

RAy is well proven within the market since 2009 in thousands of installations in tens of countries from the poles to the equator.

It is used by Internet Service Providers as well as global Telco operators for both, backbone and last-mile microwave links.

RAy3, the 3rd generation of RAY, with possibility of asymmetric channels and 1 Gbps FDD is the top equipment for license free bands.

## RAy3

- ✓ 1 Gbps, 24 GHz
- ✓ 3.5 – 112 MHz channels
- ✓ Asymmetric channels
- ✓ AES 256, Sync Eth, PTP
- ✓ 1x ETH, 1x SFP, 1x USB
- ✓ Solar ready - 22W
- ✓ Each unit tested -30 to +55°C
- ✓ Full outdoor, easy installation



- ✓ Interference & obstacles tolerant
- ✓ Wifi management
- ✓ RAY Tools (Android, iOS)

RAY2

- ✓ 360 Mbps, 10, 11, 17, 18, 24 GHz
- ✓ 1.75 – 56 MHz channels
- ✓ 1x ETH, 1x SFP, 1x USB
- ✓ Solar ready - 22W
- ✓ Each unit tested -30°C to +55°C
- ✓ Full outdoor, easy installation
- ✓ Maximum distance & reliability



[AT Communication ©](#)

- ✓ Interference & obstacles tolerant
- ✓ Wifi management
- ✓ RAY Tools (Android, iOS)

RAY3 – asymmetric channels



MODEL	RAy2	RAy3
Max. Speed	<b>360 Mbps</b> <b>256 QAM</b> <b>56 MHz</b>	<b>1 Gbps</b> <b>2048 QAM</b> <b>112 MHz</b>
Speed / 56MHz	360 Mbps 256 QAM	540 Mbps 4096 QAM
Bands	10, 11, 17, 18, 24 GHz	24 GHz
Asymmetric channels	No	Yes
Channel size	1.75 – 56 MHz	3.5 – 112 MHz
Modulations	QPSK 16 – 256 QAM	QPSK 16 – 4096 QAM
AES 256	No	Yes
Sync Eth, PTP	No	Yes
ESD	4 kV	8 kV
Surge immunity	1 kV	4 kV

### RAy Tools Mobile App

- ✓ Wifi connection between unit and mobile phone
- ✓ Link calculation
  - ✓ fade margin for given distance
- ✓ Antenna Alignment
  - ✓ RSS & SNR, displayed and acoustic notification
- ✓ Link management
  - ✓ responsive web interface

### Reliability

- ✓ Each unit tested in a climatic chamber and in real traffic
- ✓ Robust input filter with no adjustable components
- ✓ All our free band units meet licensed band standards
- ✓ Built-in surge protections
- ✓ Heavy-duty industrial components
- ✓ Industrial rugged die-cast aluminium case
- ✓ -30°C to +55°C
- ✓ 3 year warranty

### Security & Integrity

- ✓ Licensed bands available (RAy2)
- ✓ FEC, interleaving, proprietary data compression
- ✓ Proprietary protocol on Radio channel
- ✓ Assigned peer unit permanently monitored
- ✓ Management - https, ssh,
- ✓ Unique ssh key for each unit

- ✓ Role-based access control (2 levels)
- ✓ AES256 encryption (RAy3)

#### Long range & Data speed

- ✓ Exceptional robustness against noise and interference
- ✓ Hitless ACM, ATPC
- ✓ Exceptional sensitivity: up to -99 dBm
- ✓ Narrow channels: 3.5 – 112 MHz (RAy3)
- ✓ Wide ranging modulation options: QPSK – 4096 QAM (RAy3)
- ✓ Asymmetric channels (RAy3)
- ✓ 2+0 solution for double speed available (10, 11, 18 GHz)

#### Easy to install and maintain

- ✓ Full outdoor unit with aluminum casing
- ✓ Direct mounting to parabolic antennas
- ✓ Simple signal polarization change through unit rotation
- ✓ Built-in spectrum analyzer for free channel search
- ✓ RSS voltage output for antenna alignment
- ✓ 17, 24 GHz - the same HW for both, L/U units
- ✓ HW button for factory and customers settings
- ✓ RAY2 and RAY3 are mechanically compatible

#### Configuration & Diagnostic

- ✓ Web interface or CLI via SSH
- ✓ Non-intrusive management via USB using either ETH/USB adapter or WiFi/USB adapter with DHCP
- ✓ SNMP including Traps and Informs
- ✓ Automatic detection of unit polarization
- ✓ Constellation diagram of the received signal
- ✓ Temperature, Power voltage, RSS, MSE, BER, Data rate, Output power status and history avail. as text or charts

### **RAY - Microwave Link**