ETL-210A COFDM Ethernet-over-Air Adaptor

300+KM Long Range Video & Data Link for UAV/USV

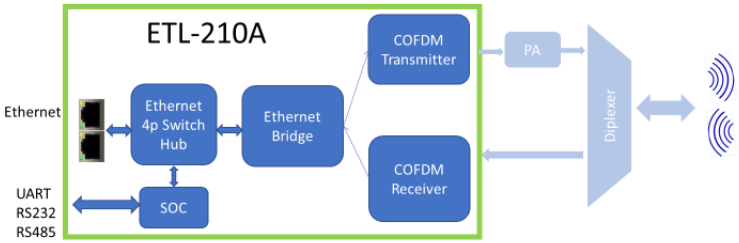
The ETL-210A is utilized for long-distance broadband wireless communication, offering transparent Ethernet and UART interfaces to effectively extend data transmission distances. Its seamless interface design facilitates effortless integration with existing application software.

Powered by reliable and robust COFDM communication technology, the ETL-210A inherently possesses characteristics such as long-distance coverage, resistance to multipath interference, and high-speed mobility. Particularly in challenging communication environments, it establishes effective communication links, overcoming the limitations of conventional communication architectures.

Common application scenarios for the ETL-210A encompass aircraft, ships, high-speed trains, subways, remote islands, mountainous regions, and emergency evacuation and rescue communication networks. With practical communication distances exceeding 500 kilometers, it supports data bandwidths ranging from 1 to 26.8 Mbps, adapting to diverse application requirements.

At its core, the ETL-210A incorporates a COFDM ASIC chip developed independently by Taiwanese professionals. All components, including the main chip, firmware, and boards, are meticulously designed and manufactured in Taiwan. With its competitive pricing, comprehensive functionality, industrial independence, and considerations for national security and communication, the ETL-210A stands out with distinct advantages.

The COFDM chip utilized in the ETL-210A has undergone extensive validation through numerous practical applications both domestically and internationally. Its superior performance has earned high praise from users across various applications, solidifying its reputation as a reliable and effective component within the system.



System Features

- COFDM Technology
- Full duplex high bandwidth video & data Link
- long-distance and high mobility
- Resilience to multipath echo and noise interference
- Configurable transmission parameters including,
  - Frequency, Bandwidth, Code rate , Guard interval , QAM size(constellation), FFT size, Output gain (attenuation)
- Real-world application field verification of communication distances exceeding 500 kilometers.
- Separate channels for uplink and downlink (Frequency Division Multiplexing, FDM), excellent stealth capability, strong resistance to malicious interference (jammer).
- Point-to-point main communication link, bidirectional high-bandwidth communication. It can simultaneously support an unlimited number of unidirectional receivers sharing downlink information, including images and data.
- Transparent interfaces: Ethernet RJ-45 for Ethernet and RS-232/UART interfaces.
- Data throughput >15 Mbps+15Mbps @16QAM mode (max. 26.8 Mbps+26.8 Mbps @64QAM).
- Simple to use, quick startup in approximately 5 seconds.
- Supports military-grade AES-128 & AES-256 encryption protocols.
- Supports active tracking antenna.
- Communication device control interface: UART/RS-232/RS-485 AT command or Ethernet UDP/HTTP (customizable).

Order Information:

Model	Features
ETL-210A-B (w/o PA)	Ethernet Over Air Adaptor Base Module without PA/Filter
ETL-210A-PATV	Ethernet Over Air Adaptor Optimized operation band: 400~800 MHz *Build-in 200mW PA (23 dBm)
ETL-210A-PA2.4G	Ethernet Over Air Adaptor Optimized operation band: 2.2G~2.4G MHz *Build-in 8 W PA (39 dBm)
315/433/866/900/1.2G/2.4G/3G/4G/5.8G band support	Various uplink/downlink channel band customization service available on request.
Auto Tracking Antenna	Antenna Gain > 21 dBi Tracking > 300 km Controller: Mavlink, Ethernet UDP and UART Pelco API I/F Coverage 360° Pan, 120° Tilt Optional Automatic North Finder

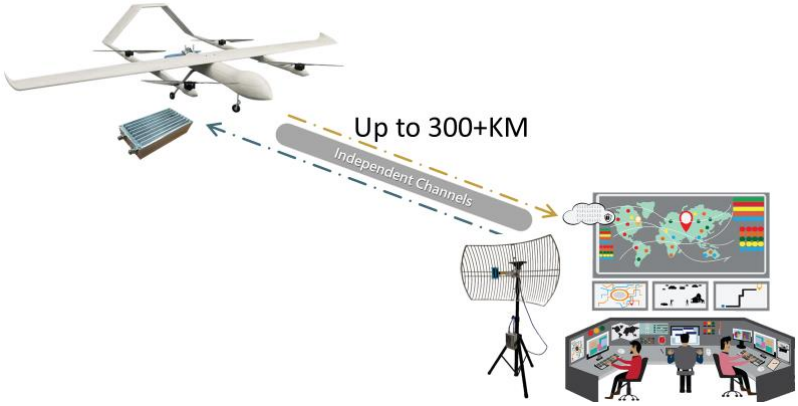
Note:

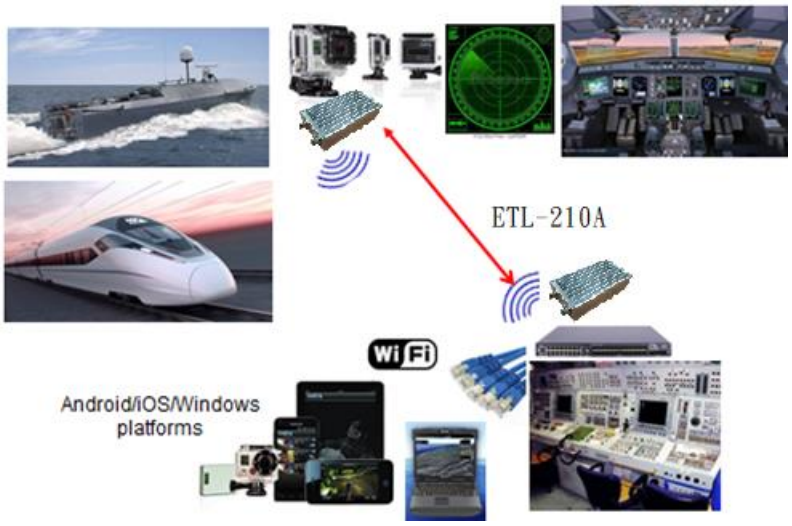
***Higher power amplifiers are available for 300+KM long range applications.**

Application Example

Transparent Ethernet Link

Long range Video & C2 link for UAV





Range with 8W Power Amplifier

Standard omni-dipole

20~30+ KM

Patch Antenna

60~90+ KM

Auto Tracking Antenna

200~300+ KM

ETL-210A Specifications

Summary: Throughputs

- True throughput: up to 26.8 Mbps x 2 (Equivalents to WiFi line rate >90 Mbps)

Summary: Range

- Throughputs : 26.8 Mbps(64QAM): TBD
- Throughputs :17.8Mbps(16QAM): TBD
- Throughputs : 8.9Mbps(QPSK): TBD

Table 1. Parameters

RF Frequency (Optimized band) (Tuning step: 1KHz)	ETL-210A-B	100~2500MHz
Bandwidth		1/2/2.5/3/4/5/6/7/8 MHz
Modulation		COFDM
FFT		2K/4K/8K
Constellation		QPSK/16QAM/64QAM
Code Rate (CR)		1/2,2/3,3/4,5/6,7/8
Guard Interval (GI)		1/4,1/8,1/16,1/32
Digital Attenuator	Range 0~-47 dB, step size 1dB	

Table 2. Receiver RF Performance

RF Performance (Single Antenna Only)	Pmax	>+5 dBm	
	Pmin @ FFT:2K, 16QAM, CR:2/3 GI:1/8	Bandwidth	Sensitivity
		1 MHz	<-99 dBm
		1.5 MHz	<-98 dBm
		2 MHz	<-96 dBm
		2.5 MHz	<-95 dBm
		3 MHz	<-95 dBm
		4 MHz	<-94 dBm
		5 MHz	<-92 dBm
		6 MHz	<-91 dBm
		7 MHz	<-90 dBm
		8 MHz	<-90 dBm

<table>
<tr>
<td>Mobility TU6/RA6/ Doppler Performance</td>
<td>
Results

Typical Urban Reception (TU6) Results

The following results are the Doppler Frequency to achieve the point of failure of 1 picture artefact or error in a 20 second time period.

<table>
<tr><th>Modulation Mode</th><th>typ</th></tr>
<tr><td>8K 64QAM, FEC 1/2 and Guard Band 1/8</td><td>45Hz</td></tr>
<tr><td>8K 64QAM, FEC 2/3 and Guard Band 1/8</td><td>26Hz</td></tr>
<tr><td>2K 64QAM, FEC 2/3 and Guard Band 1/32</td><td>128Hz</td></tr>
<tr><td>2K 16QAM, FEC 3/4 and Guard Band 1/32</td><td>195Hz</td></tr>
</table>

Rural Area Reception (RA6) Results

The following results are the Doppler Frequency to achieve the point of failure of 1 picture artefact or error in a 20 second time period.

<table>
<tr><th>Modulation Mode</th><th>typ</th></tr>
<tr><td>8K 64QAM, FEC 1/2 and Guard Band 1/8</td><td>30Hz</td></tr>
<tr><td>8K 64QAM, FEC 2/3 and Guard Band 1/8</td><td>20Hz</td></tr>
<tr><td>2K 64QAM, FEC 2/3 and Guard Band 1/32</td><td>86Hz</td></tr>
<tr><td>2K 16QAM, FEC 3/4 and Guard Band 1/32</td><td>119Hz</td></tr>
</table>

0dB Echo With Doppler Reception (0dB) Results

The following results are the Doppler Frequency to achieve the point of failure of 1 picture artefact or error in a 20 second time period.

<table>
<tr><th>Modulation Mode</th><th>typ</th></tr>
<tr><td>8K 64QAM, FEC 1/2 and Guard Band 1/8</td><td>50Hz</td></tr>
<tr><td>8K 64QAM, FEC 2/3 and Guard Band 1/8</td><td>43Hz</td></tr>
<tr><td>2K 64QAM, FEC 2/3 and Guard Band 1/32</td><td>160Hz</td></tr>
<tr><td>2K 16QAM, FEC 3/4 and Guard Band 1/32</td><td>233Hz</td></tr>
</table>
</td>
</tr>
</table>

Table 3. Transmitter RF Performance

Frequency range	100 .. 2500MHz, tuning step 1KHz
ETL-210A-B (w/o PA) RF Output Level	5 dBm (113 dBuV) @100-470 MHz 5 dBm (113 dBuV) @470-950 MHz 0 dBm (108 dBuV) @950-1900MHz -5 dBm (103 dBuV) @1900-2500MHz
Digital Attenuator	Range:+0/-47dB , Step size 1dB
MER	Typically, @-5 dB attenuation by ADRF6755 >39dB@V-band >39dB@470-950 MHz >36dB@950-1900MHz >34dB@1900-2500MHz
Spectrum Shoulder (Adjacent channel)	>48dB
Phase noise	<-114dBc @ 100kHz
Carrier Suppression	>42dB

System Specifications

Data & Power	
Data Rate	528 Kbps ~26.8Mbps
Connectors	RF: SMA 50 Ohm Ethernet: RJ 45 x 2 UART/RS-232 x 2
Installation and management	Plug-and-play installation; Local LED management display
Power Consumption	ETL-210A-B: DC 12V 550mA ETL-210A-PATV: DC 12V 850mA ETL-210A-2.4G: DC 24V 3000mA
Power Adaptor	DC 12V ~30V

General	
Display and indicators	LED indicators are located on the top panel and RJ45 connector Network indicators: Coax link, Ethernet link/activity x2
Compliance	IEEE 802.3af, IEEE 802.3at, RoHS.
Operating conditions	-40 °C to 70 °C Humidity max. 95% RH (non-condensing)
Storage conditions	-40 °C to 74 °C (-40 °F to 165 °F)
Dimensions	200x135x70mm,
Weight	1160g (with 10W PA, w/o filter & ant.)

<HIDES Contact>
HIDES Tech. Inc.
6F, No. 86, Baozhong Rd, Xindian Dist, New Taipei City 231, Taiwan
Tel:+886-2-29172417
support@Hides.com.tw http://www.Hides.com.tw