



# Ethernet Series HTplus Industrial 900 MHz Radio Supplemental Data Sheet

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The FreeWave Technologies HTplus is a leap forward for customers who need an industrial grade high speed Ethernet radio that operates in harsh environments and noisy RF conditions. Designed to the same high level of quality that FreeWave products are renowned, the HTplus is a rugged and reliable solution that performs where other products fall apart.

The HTplus product family supports TCP, UDP and serial communications, all in one package. All radios are built and tested at FreeWave's world class manufacturing facility in Boulder, Colorado.

## Features

- Versatile: A single radio can be configured as a Gateway, End Point or Repeater for maximum versatility.
- High Speed: 867 Kbps over-the-air throughput.
- Wide Input Voltage Range: 6 to 30 VDC.
- Low Current Draw at 12 Volts:
  - 150 mA in full time receive.
  - 550 mA transmit current.
- Strong Signal Performance: Maintains high sensitivity even in marginal conditions.
- High Noise Immunity: Superior performance in noise congested environments.
- Range: 15 miles with clear line of sight.
- UL Approved for Class 1 Div 2.
- Industrial Grade Specifications: 100% tested for RF performance from - 40 °C to + 60 °C.

## Benefits

- Long Range: 15 miles with clear line of sight; up to 30 miles\* at lower bandwidth. (approx. 15% less)
- High speed: Up to 867 Kbps.
- Secure multiple layers of cyber security including:
  - AES-128 encryption
  - RADIUS authentication
  - MAC filtering
  - SSL
- VLAN capability (802.1Q) allows multiple segregated data flows over single radio.
- Ethernet and Serial Interfaces: Allow migration of existing serial devices to IP networks.
- Industrial grade performance: UL Class 1 Div 2 & extended temperature range for extreme environments.
- License free: Deploy immediately.
- Plug and Play Connectivity: Configuration requires minimal setup for Ethernet bridging.

## Applications

- Long range: 867 Kbps wireless Ethernet.
- Gateway for serial/legacy networks and/or devices to IP network.
- Video and/or voice-over-IP.
- Mobile network access for vehicle based operation.

## Security

- AES 128 bit: Encryption and proprietary spread spectrum technology.
- RADIUS Central Authentication: Allows system to have connectivity with only system administered authenticated devices.
- VLAN Tagging: Data separation.
- MAC Address Filtering: Allows each port to be secure by only allowing connectivity with known MAC addresses.
- Error Free Communications: 32 bit CRC with automatic retransmission.
- Secure: Proprietary spread spectrum technology prevents detection and unauthorized access.

*cont.*

\* Contact FreeWave for implementation details.



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## Protocols:

- Wireless: CSMA/CA (collision avoidance)
- Ethernet: IEEE 802.3, Ethernet II, IEEE 802.1Q (trunk, access, and native), STP, IGMP, Multicast
- TCP/IP: DHCP, ICMP, UDP, TCP, ARP, Multicast, SNMP, TFTP
- Serial: Modbus, DNP.3, DF1, BSAP
- Optional: Modbus/TCP

## FreeWave Cyber Security Suite:

- Encryption: AES-128/256 available.
- Authentication: RADIUS
- Traffic segregation: 802.1Q VLAN
- Management: SSL, SSH, HTTPS, Local Terminal

## Management:

- HTTP, HTTPS, TELNET, local console
- SNMPv1/v2/v3, MIB II, enterprise MIB
- SYSLOG
- FreeWave CommControl Plus Diagnostics
- Discovery Server

## Environmental:

Temperature: -40° C to +60° C  
Humidity: 0 - 95% non-condensing

## Electrical:

Input power: 6 - 30 VDC  
Current consumption (nominal):

| Mode     | 6 VDC  | 12 VDC | 30 VDC |
|----------|--------|--------|--------|
| Transmit | 1.1 A  | 550 mA | 220 mA |
| Receive  | 252 mA | 150 mA | 63 mA  |
| Idle     | 140 mA | 71 mA  | 32 mA  |

## Mechanical:

Case: Die Case Aluminum  
Dimensions: 165L x 74 W x 59 H (mm)  
Weight: 427 g  
Mounting options: Flat surface mount brackets, DIN rail.

## Agency Approvals:

FCC part 15.247 (DTS)  
UL/CSA class 1 Div 2  
IC

## Radio:

- System gain: 129 dB
- Carrier power: 5mW to 1W
- Output impedance: 50 Ohms
- Occupied bandwidth: 611.2 kHz
- Modulation: CPFSK (continuous phase FSK)
- Receiver sensitivity:  
-102 dBm @ 614 Kbps with 10<sup>-4</sup> BER  
-96 dBm @ 867 Kbps with 10<sup>-4</sup> BER

## Physical Interface:

- Ethernet: 10/100baseT auto MDX, RJ-45
- Serial: COM1: RS-232/422/485, DB-9F, DCE  
COM2: RS-232/422/485, DB-9F, DCE  
1,200-115,200 bps serial ports
- Antenna: TNC connector (female)
- LEDs: CD, TX, CTS, LAN, COM1, COM2, ERR

## General Specifications:

- Data rate: 867 Kbps/614 Kbps user configured air link
- Net Throughput best-in-class
- Frequency band: 902-928 MHz ISM band
- Spreading mode: DTS/FHSS
- Range
  - Typical fixed range: 15 miles with clear line of sight; up to 30 miles\* at lower bandwidth
  - Typical mobile range (parked): 3 miles
  - Typical mobile range (moving): 1 mile
- Available configurations in Single Radio User Configurable:
  - Access point
  - Gateway
  - Repeater
- Repeater / Access Point combined
- MTBF - 340,000 HRS

\* Contact FreeWave for implementation details.