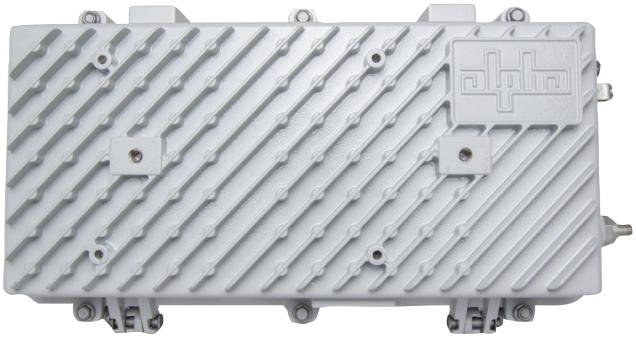
AlphaGateway IoT

Internet of Things Network Access Device



Features:

- Enables IoT and M2M applications
- Single-box rapid deployment solution
- Ethernet backhaul via Alpha hardened DOCSIS 3.0 modem
- Passively cooled carrier-grade design (IP67)
- Supports multicarrier LoRaWAN transmission
- 2x LoRaWAN RF antenna connections
- Full-duplex operation

The AlphaGateway Internet-of-Things (IoT) is the bridge between the HFC network, Low Power Wide Area Network (LoRaWAN) technology, and the growing field of IoT business opportunities.

The AlphaGateway IoT joins the growing family of Outside Plant (OSP) AlphaGateways. A backhaul-capable hardened gateway designed for IoT data communications and Machine-to-Machine (M2M) connections, the AlphaGateway IoT has been developed for network operators to increase their service offerings.

This strand-mounted, HFC-powered, single-box solution utilizes the power, backhaul, and real-estate of the HFC network to provide communication between devices in city and utility applications. The LoRaWAN technology powered by the AlphaGateway IoT aggregates and bi-directionally transmits small amounts of data over long distances for any application in the IoT industry using connected sensors, including utility metering, street light monitoring/control, as well as traffic, activity, and movement monitoring amongst many other use cases.

AlphaGateway IoT Specifications

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Electrical	
Input Voltage Range:	42 to 93VAC @ 60Hz
Input Voltage Waveforms:	Sine, trapezoidal, quasi-square wave
Input Voltage Turn On:	44VAC
Input Voltage Turn Off (Hysteresis)**:**	42VAC
Nominal Input Voltage:	75VAC @ 60Hz
Hold Up Time:	16.67ms
Over Voltage Protection	93VAC
Power Supply Max Output:	50W load
Power Supply Efficiency:	> ± 80%

Mechanical	
Dimensions H x W x L (in)**:**	9 x 6.3 x 16
Weight (lb)**:**	20

Environmental and Agency	
Operating Temperature:	–40 to +60°C
Storage Temperature:	–40 to +70°C
Humidity:	5 to 95% non-condensing
Water Proof Level:	UL 50E Type 6; IEC 60529 IP67
Nominal Input Voltage:	75VAC @ 60Hz
Safety:	**CSA/UL/ 60950-1:** ED 2 / 60950-22: ED 2 **NRTL/C**
Radiated Immunity:	**IEC 61000-4-3** 80 to 6000MHz: 10V/m
Radiated Emmisions:	**FCC Part 15 Class B**
Surge:	**EN 61000-4-5** (+/-6 kV common mode) **IEEE 587 Category B3**
FCC for LoRaWAN Transmissions:	**FCC Part 15.247:** Operation within the 902-928 MHz band **FCC Part 15.109:** Unintentional radiator–radiated emission limits **FCC Part 15.209:** Intentional radiator–radiated emission limits
RoHS:	Directive 2011/65/EU

Cable Modem	
Compliance:	DOCSIS 3.0
Transmit Frequency Range:	5 to 42MHz
Receive Frequency Range:	88 to 1002MHz
Channel Bandwidth:	6MHz
Downstream Data Rate:	Up to 300Mbps (8 bonded channels)
Modulation:	**TDMA:** QPSK, QAM (8, 16, 32, 64) **S-CDMA:** QPSK, QAM (8, 16, 32, 64, 128)
Upstream Data Rate:	Up to 100Mbps (4 bonded channels)
Radiated Emisions:	**FCC Part 15 Class B**
Outdoor Hardened:	Yes
Network Management Protocols:	SNMPv1, V2C, V3, HTTP
Input Connector:	RF F-type female
Input Impedance:	75Ohm
Privacy:	BPI+
Downstream Modulation:	64 or 256QAM

LoRaWAN Gateway	
Interfaces	
GPS:	N-type
LoRa Antenna (2 Ports)**:**	N-type
LoRa Radio Parameters	
ISM NA Band:	902 to 915MHz (Rx), 923 to 928MHz (Tx)
Tx Power:	2 x 1W (2 x 30dBm)
Rx Sensitivity:	-142dBm (SF12, 293 bits/sec)
Rx Noise Figure:	3.5dBm
Rx Linearity:	-10dBm
Rx Dynamic Range:	70dB analog, 100+ dB Digital
Mobility/Localization:	Yes
Software and Management	
GUI:	• Embedded management webpage • Auto-discoverable over IP
Tools:	• Access control list management • System health monitor flight • Recorder radio configuration and control • Remote software upgrade • Active and passive image management • Factory image provisioning
Networking:	• DHCPv4 client • TFTP server • HTTP server • Firewall and access lists

GPS Antenna (Position and Synchronized Timing)	
Frequency Range:	1575.42 ±10MHz
LNA Gain:	40dB
LNA Noise Figure:	0.5dB
Out of Band Signal Rejection:	>35dB at ±40MHz
Directivity:	Omnidirectional in azimuth, 140 degree - 5dB beam-width in elevation
Polarization:	Right hand circular
DC Power:	2.7 to 5.5V, < 15mA supplied on RF center conductor

LoRaWAN Radio	
Uplink:	• Full duplex operation • Full 64 + 8 LoRaWAN uplink channel support • Flexible uplink channel configuration (eg. 32 channel full Rx diversity or 56 channel + 8 channel Rx diversity) • (64) 125kHz channels numbered 0 to 63, supporting DR0 to DR3, starting at 902.3MHz and incrementing linearly by 200kHz to 914.9MHz • (8) 500kHz channels numbered 64-71, supporting DR4, starting at 903MHz and incrementing linearly by 1.6MHz to 914.2MHz
Link Budget Up:	(8) 500kHz channels numbered 0 to 7, supporting DR8 to DR13, starting at 923.3MHz and incrementing linearly by 600kHz to 927.5MHz
FCC Radio Certification:	**FCC ID:** 2ALEPT0004564

LoRaWAN Regional Summary

Region:	Europe	North America
Frequency Bandwidth:	867 to 869MHz	902 to 928MHz
Channels:	10	64 + 8
Channel Bandwidth Up:	125/250kHz	125/500kHz
Channel Bandwidth Down:	125kHz	500kHz
TX Power Up:	+14dBm	+20dBm typ (+30dBm allowed)
TX Power Down:	+14dBm	+30dBm
SF Up:	7 to 12	to 10
Data Rate:	250dps to 50kbps	980bps to 21.9kpbs
Link Budget Up:	155db	154dbB
Link Budget Down:	155db	157db

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