Description

A DWETH is an Ultra-Wideband (UWB) transceiver intended for use with the Ciholas UWB (CUWB) Real Time Location Systems (RTLS). In a typical CUWB RTLS the DWETH operates as a static, or anchored, device providing reference locations for the system. DWETH101 uses Ethernet to provide reliable, high-bandwidth data connectivity, and has a comprehensive set of on board sensors. DWETH101 anchors contain a built-in Ethernet switch and support Chainable Powered Ethernet (CPE), allowing for a chain of devices to be powered via a single source.

DWETH101 devices are FCC compliant in the United States.

1 Features

- 32-bit ARM Cortex-M7 RISC processor with FPU
  - 300MHz Maximum Speed
  - 2048kB Flash
  - 16kB Cache
  - 384kB SRAM
- Decawave DW1000 Ultra-Wideband transceiver
  - IEEE802.15.4-2011 Compliant
  - 6 RF bands from 3.5GHz to 6.5GHz
  - Data rates 110kbps-6.8Mbps
  - Up to 1023-byte packet length
- Integrated Omni-directional UWB antenna
- Motion Processing Unit (MPU)
  - 16-bit 3-Axis Gyroscope 250-2000°/S
  - 16-bit 3-axis Accelerometer ±2g up to ±16g
  - 14-bit 3-axis Magnetometer ±4800T
  - Digital Motion Processing including low-power quaternion
- MEMS High Resolution Barometric Altimeter
  - 24-bit 0.01hPa RMS
  - 260-1260hPa absolute pressure range
  - 16-bit temperature ±2°C absolute accuracy
- Temperature and Humidity
  - ±4% (max) Relative Humidity from 0 to 80%
  - ±0.4% (max) Temperature from -10 to 125°C
- Tri-Color LED Indicator
- Integrated 10/100 Managed Switch
- Compatible with Ciholas Chainable Powered Ethernet (CPE)
- Compatible with Ciholas UWB RTLS system

2 Ordering

Model	Part Number	Color	Description
DWETH101	E00617-00697	White	Two Port Chainable Power FCC compliant in the US
DWETH101	E00617-00692	Black	Two Port Chainable Power FCC compliant in the US

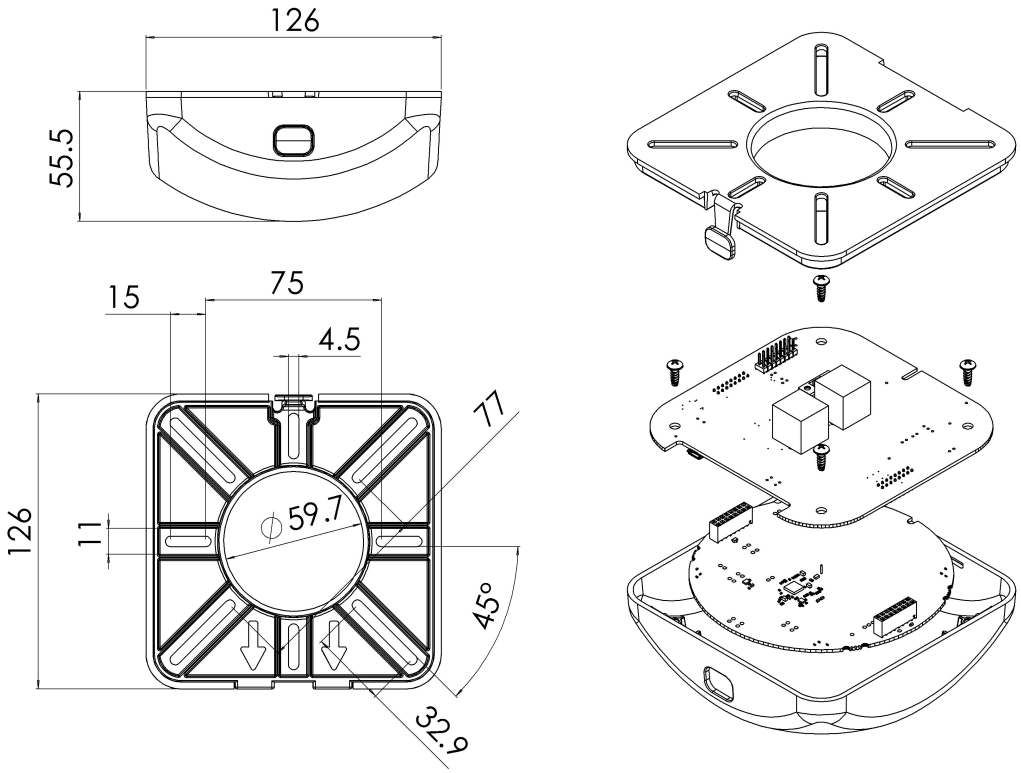
Available from the Ciholas Webshop

3 Electrical

Parameter	Description	Min.	Typ.	Max	Units
Vin_{in}	DWETH101	5	48	60	V
P	Nominal Operating Power		2	4	W
T_o	Operational Temperature	0		55	°C

4 Mechanical

Parameter	Description	Min.	Typ.	Max	Units
Mass	Typical Unit Mass	240	245	250	g



Dimension unit: millimeter

5 Operation

5.1 Power and Communication

DWETH101 is powered via CPE. To power and communicate with the device it should be plugged into a CPE compatible power source. The following diagram shows connection using a PoE compatible switch with CPE100 powering a chain:

The DWETH101 may also be powered using a passive injector with a standard (non-PoE compliant) switch:

On connection the DWETH101 will source power from the upstream CPE device and become a CPE provider on the other Ethernet port.

Once plugged in the DWETH will attempt to gather network parameters using the DHCP protocol. If successful it will announce its presence to the CUWB network server on the subnet provided by DHCP. If the DWETH111 fails to connect to the DHCP server it will fall back on auto-IP parameters and announce its presence using those parameters.

5.2 Configuration

Details regarding DWETH setup and configuration for the CUWB RTLS can be found on theCUWB Documentation Site.

5.3 Sensor Data Reporting

DWETH101 has a variety of sensors and can be configured to transmit data from those sensors. Sensor data received by the CUWB server is broadcast via the Ciholas Data Protocol (CDP) providing access to users.

Sensor scaling and data rates can be configured for the following types of data:

Sensor Type	Measurement Standard
3-Axis Accelerometer	standard gravity (g)
3-Axis Gyroscope	°/Second
3-Axis Magnetometer	µTesla
Absolute Pressure	hPascal
Temperature	°C
Quaternions	Unit Coefficients

5.4 LED Indication

The DWETH111 has tri-color (RGB) LEDs for conveying device state to users. In normal[1] operation the device state can be determined using the table below:

Network Status	Color	ON Time	Period
ON Network	Green	10mS	1.0S
OFF Network	Green	10mS	10.0S
Power On Reset[2]	Blue	500mS	N/A

1. *This table denotes normal LED operation. The CUWB network can be configured to show different patterns on the LEDs*
2. *Power On Reset (POR) occurs only on system reset. This will happen when charging a dead battery, on reboot after firmware update, and when the device resets due to system watchdog.*

The RGB LED also conveys error states to the user. An error is indicated by a 500mS red flash followed by a color sequence. The following color sequences are used to decode error states:

Color Sequence	Code	Description
Red — White-White-White	7	DW1000 communication error

5.5 Error Handling

5.5.1 [CODE 7] - DW1000 communication error

This indicates that the DWETH firmware is unable to communicate with the UWB transceiver. To clear this error reset the device by removing and reapplying power. If the problem persists please contact Ciholas for support.

5.6 Regulatory Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

6 More Information

Please visit the following links for more information and documentation regarding Ciholas UWB systems and products:

- Documentation, installation, and usage instructions visit CUWB.io
- To purchase Ciholas UWB products please visit the Ciholas Shop
- Ask other users questions and find community information in the Community Forum
- Learn more about Ciholas services at www.ciholas.com

7 DWETH101 Datasheet Change Log

Version	Date	Change Description
1.0	2018-05-10	Initial Public Release