



# Loco positioning node

SKU: 114990656

The Loco Positioning Node is a versatile positioning device that can run either as an Anchor or Tag in a Loco Positioning system. The system measures the distance between Nodes and Tags, and from those distances the absolute position of objects carrying Tags can be calculated.



## 1. Introduction

For more information on the Loco Positioning System please see the Loco Positioning System page on our website. Specifications are based on the standard 2-way ranging mode.

## 2. Features

- Supports Anchor, Tag or Sniffer mode
- Can be used as a standalone system with some Nodes acting as Anchors and one or more nodes acting as Tags
- Multiple powering options
- On board MCU

## 3. Electrical specification

- Based on the Decawave DWM1000 module
- Implements IEEE 802.15.4 UWB
- STM32F072 MCU (Cortex-M0, 48MHz, 16kb SRAM, 128kb flash)
- High precision pressure sensor (LPS25H)
- micro-USB connector
- Full speed USB device interface
- Powered by USB, 6 mm barrel jack (5 - 12V) or screw terminal (5 - 12V)
- FTDI debug port (not populated)
- Serial connector compatible with ESP8266 module (not populated)
- Power consumption 180 mA max

## 4. Ranging specification

- Ranging accuracy  $\pm 10$  cm according to DWM1000 spec
- Maximum tested range 10 m
- Nr of anchors required: theoretical minimum of 4 for 3D positioning. More anchors adds redundancy and accuracy, up to 8 supported.

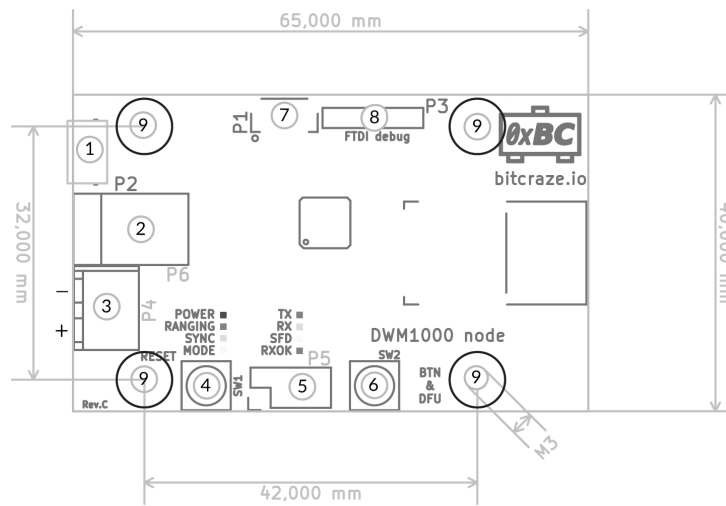
## 5. Radio specification

- Operates at 3.2 - 7 GHz
- Channel bandwidth 500 MHz

## 6. Mechanical specifications

- Weight: 13.3 g
- Size (WxHxD): 65x40x13 mm
- 4 mounting holes for M3 screws

## 7. Mechanical drawing



ID	Type	Description
1	Connector	micro-USB for power and communication
2	Connector	DC-jack (5V)
3	Connector	Terminal (5V)
4	Button	Reset
5	Connector	Designed for ESP8266 but can be used for other things. <b>Note:</b> Pin-out changed between RevD and RevE (see blow)
6	Button	If pressed and held during reset or power on this will put the board into DFU bootloader mode. When the system is up and running the button is unused, but could be used to trigger functionality in the firmware.
7	Connector	SWD connector for programming and debugging MCU. Uses same pin-out as Crazyflie 2.X.
8	Connector	For FTDI serial-to-USB cable (TTL-232R-3V3). Can be used as a serial port for debugging and to power the board. Note that signals are 3V3 and power is 5V.
9	Mounting	M3 mounting holes

## LED legend:

LED	Color	Controlled by	Description
POWER	Blue	MCU	On when board is powered
RANGING	Red	MCU	Blinking when ranging is in progress
SYNC	Green	MCU	TDB
MODE	Yellow	MCU	On in Anchor mode, off in Tag mode and blinking in Sniffer mode
TX	Red	DWM1000	Transmitting
RX	Green	DWM1000	Receiving
SFD	Yellow	DWM1000	Received packet timestamp
RXOK	Red	DWM1000	Packet received without error

## 8. Package contents

- 1 x Loco positioning node

## 9. Errata

## 10. Hardware revisions

Revision	Comment
D	Initial release
E	Extra I/O routed to P5 connector and improved micro-USB connector

## 11. History

Version	Comment	Date
1	Initial release	2020-03-26