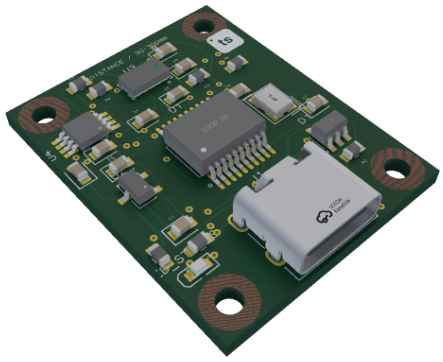
USB-C Distance Sensor

1.1 Description

An optical time-of-flight sensor that measures the distance to a target in millimeters.



Assembly view

1.2 Device specifications

Parameter	Specification
Sensing method	Optical time of flight
Measurement	Distance in millimeters; board design targets 30–300 mm
Host interface	WebUSB to I²C, 7-bit address 0x29
PCB dimensions	24 × 30 mm
Mounting holes	4 × Ø2.2 mm for M2 screws; 19 × 25 mm center spacing

1.3 Using the board

Choose **Add device** → **Distance sensor**, grant USB access, and face the optical window toward the target. The card shows a live reading and 30 seconds of history. Design an opening around the sensor. The console flags readings outside 30–300 mm and leaves a gap for invalid returns.

Device guide

2 Protocol reference

WebUSB → I²C · 7-bit address `0x29`. The driver initializes and calibrates the sensor at each connection.

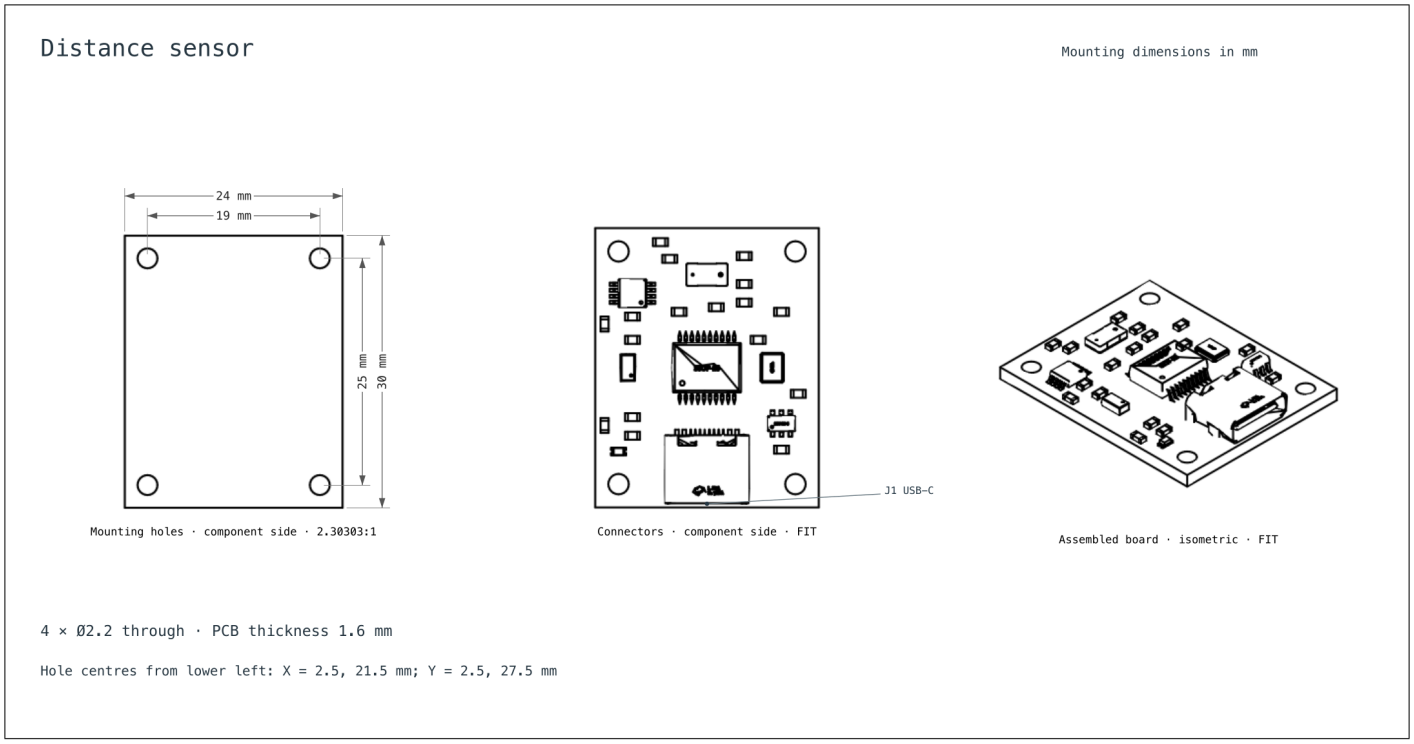
Operation	Request or signal	Result
Identify	Read register `0xC0`.	Model ID `0xEE`.
Initialize	Run the driver's `initialize()` sequence.	Applies tuning and performs reference calibration.
Start a sample	Run the single-shot start sequence in `sample()`.	Starts one range measurement.
Wait for completion	Poll register `0x13`, mask `0x07`, after the start bit clears.	A nonzero masked value signals a result.
Read distance	Read 12 bytes starting at `0x14`.	Bytes 10–11 give millimeters, high byte first.
Clear interrupt	Write `0x01` to `0x0B`.	Acknowledges the measurement.

The console accepts the distance when bits 6–3 of byte 0 equal 11. See the driver for the full initialization sequence and USB packet format.

Protocol implementation

3 Mechanical information

3.1 Assembly and mounting



Component-side plan and isometric assembly. Dimensions in millimeters.

3.2 Installation dimensions

The PCB measures **24 × 30 mm**, with **4 × Ø2.2 mm** clearance holes for M2 screws. The centre-to-centre spacing is **19 × 25 mm**. Orient the component side with the **J1 USB-C port at the bottom**. Measure right and up from the **lower-left corner of the PCB** in the component-side view. The hole centres are at X = 2.5, 21.5 mm and Y = 2.5, 27.5 mm.

Modeled component height: approximately 3.3 mm above the component-side PCB surface.

3.3 Design resources

Device guide · **Full-size mounting drawing** · **Drawing TSX** · **PCB source**