USB-C Rotary Encoder

1.1 Description

An endless dial that counts detents in either direction and doubles as a pushbutton.



Assembly view

1.2 Device specifications

Parameter	Specification
Rotation	Continuous, 30 detents per revolution
Push switch	1.5 mm axial travel
Shaft	Ø6 mm D-shaft, 4.5 mm across flat. Tip sits 24.5 mm above PCB when released.
Host interface	USB serial, 115200 baud; relative count and button state
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** → **Rotary encoder**. Turn the shaft to change the relative count or push it to select. Power-up establishes zero. Allow axial travel behind a printed knob so the push switch can close.

Device guide

2 Protocol reference

USB serial · 115200 baud · DTR on. Send one ASCII command per line, ending in LF (`\n`).

Command	Purpose	Reply
`id`	Identify the device and firmware.	`DEVICE tscircuit encoder 1.0.0`
`help`	List supported commands.	One line of command syntax.
`status`	Request the current detent count and push state.	One JSON report, shown below.
`led on`	Turn the indicator on.	`OK led=on`
`led off`	Turn the indicator off.	`OK led=off`

Streamed report

The board streams one JSON object per line and repeats an unchanged reading about every 250 ms.

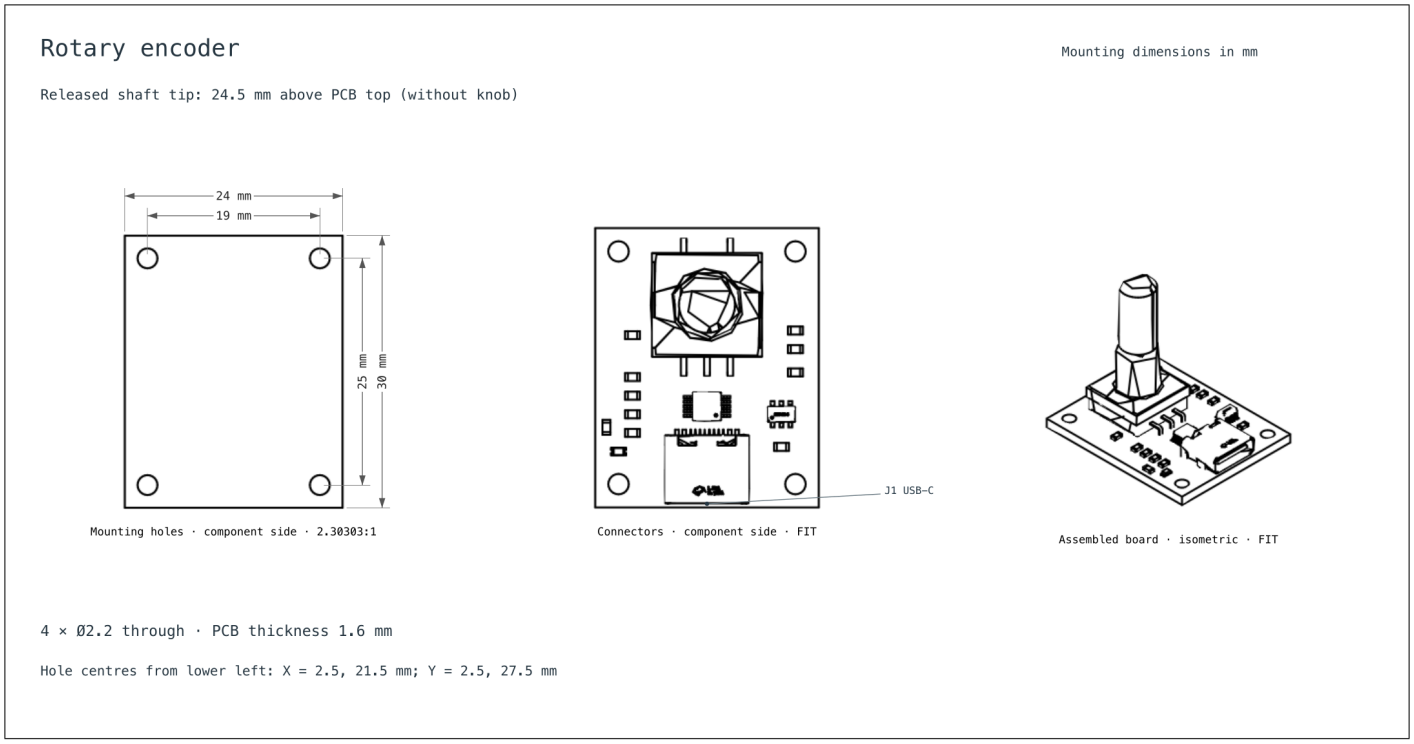
```
{"module":"dial","count":3,"pressed":1,"invalid":0,"uptime_ms":1250,"led":0}
```

The wrapping 32-bit `count` gives detents since power-up. Read it as signed to get direction: `4294967295` represents −1. `pressed` is 1 while the shaft is held down. `invalid` counts rejected quadrature transitions. Changes are sent at most once per 20 ms. `uptime_ms` counts milliseconds since power-up, and `led` is 1 when the indicator is on.

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.

Shaft-tip height: 24.5 mm above the component-side PCB surface, with the push switch released and no knob fitted. The Ø6 mm D-shaft has a 4.5 mm flat dimension. Allow 1.5 mm of axial push travel plus assembly tolerance. Alps Alpine dimensional drawing, No. 3

3.3 Design resources

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