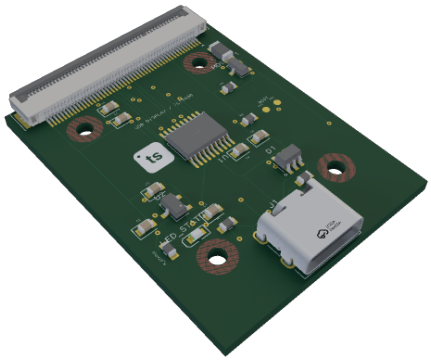
USB-C 3.5-inch Flex Display Adapter

1.1 Description

A USB adapter for streaming pictures or video to the 3.5-inch bare ER-TFT035IPS-6 panel.



Assembly view

1.2 Device specifications

Parameter	Specification
Compatible panel	BuyDisplay ER-TFT035IPS-6, 3.5-inch; panel sold separately
Image transfer	480 × 320 still frames; 120 × 80 video frames, RGB565
Backlight	0–100% software brightness
Host interface	USB serial, 115200 baud
PCB dimensions	32 × 42 mm
Mounting holes	4 × Ø2.2 mm for M2 screws; 19 × 25 mm center spacing

1.3 Using the board

With USB unplugged, seat and latch the ribbon in the 50-pin connector. Choose **Add device** → **Flex display** and select **Test pattern**. You can then choose a local image or video and set backlight brightness. Support the panel separately and leave room for the flex to bend.

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 display 1.1.0`
`help`	List supported commands.	One line of command syntax.
`init`	Initialize the panel before sending pixels.	`OK init`
`brightness`	Read the backlight setting.	`BRIGHTNESS N` (0–100)
`brightness 50`	Set backlight brightness in percent (0–100).	`BRIGHTNESS 50`
`image`	Begin a 480 × 320 still frame. Send 307200 bytes.	`READY`, then `OK frame` after the payload.
`video`	Begin a 120 × 80 video frame. Send 19200 bytes.	`READY`, then `OK frame` after the payload.

Sending a frame

Send `init` and wait for `OK init`. Send `image` or `video` and wait for `READY` before writing pixels. Write RGB565 in row order, high byte first, with no trailing newline. Wait for `OK frame` before sending the next command. Video frames expand to fill the panel and carry no audio.

Legacy binary commands

Send `A5 5A`, opcode, sequence number, payload length, payload, then CRC-8. The CRC covers the opcode through the last payload byte (polynomial `0x07`, initial value zero). The maximum payload is 48 bytes. The reply is `AC`, the same sequence number, and a status byte.

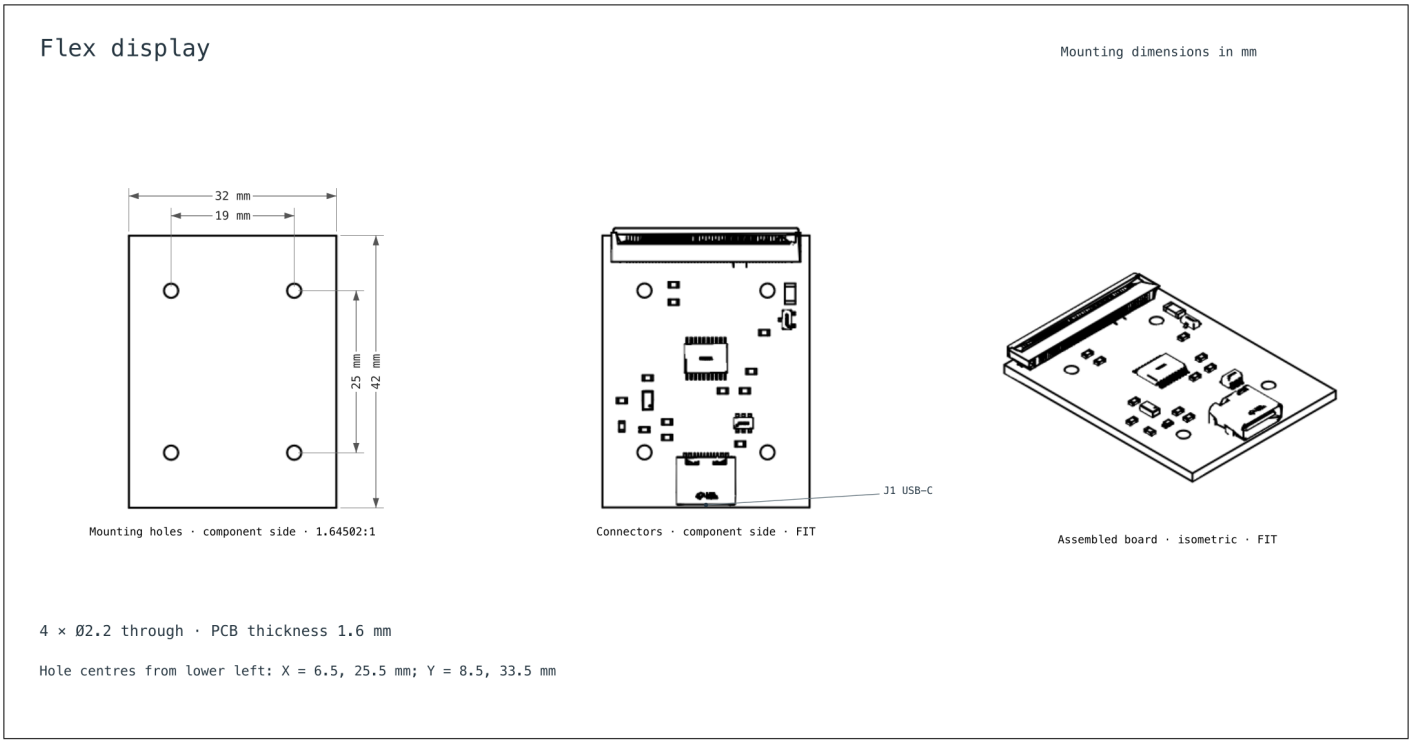
Opcode	Payload	Action
`0x01`	Empty.	Reset the panel.
`0x02`	Panel command byte, followed by up to 47 data bytes.	Write a command to the panel.
`0x03`	1–48 data bytes.	Write data to the panel.
`0x04`	One byte, `0` or `1`.	Blank the backlight or restore the chosen brightness.
`0x20`	One byte, `0` or `1`.	Turn the indicator off or on.

Status `0` means success, `2` means CRC mismatch, `3` means excessive length, and `4` means an invalid opcode or argument. Status `5` means the panel needs a reset.

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 **32 × 42 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 = 6.5, 25.5 mm and Y = 8.5, 33.5 mm.

Modeled component height: approximately 3.3 mm above the component-side PCB surface. The CAD files show the populated carrier. Allow separate space for the panel and flex cable.

3.3 Design resources

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