

# Oxide Ignition Adapter

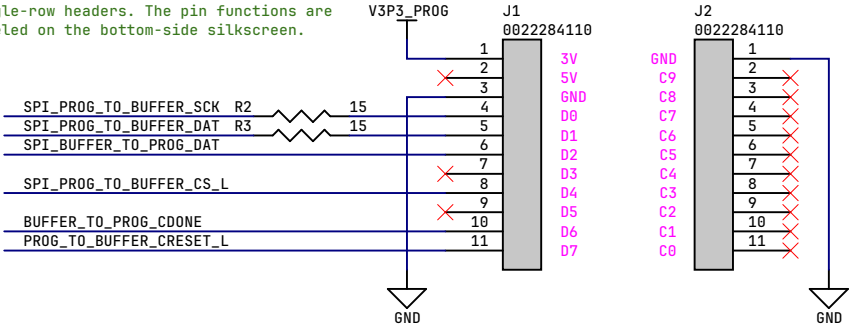
PCBA CPN: 913-0000091

Repo: [oxidecomputer/hardware-ignition-adapter](#)

## Adafruit FT232H Breakout

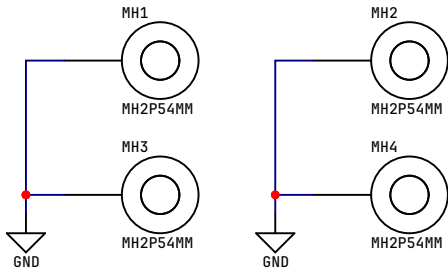
Product ID: 2264

For 80M correctness, the interface to the Adafruit board is two 0.1" 11-position single-row headers. The pin functions are labeled on the bottom-side silkscreen.



## Mounting Holes

The Adafruit board has four 2.5mm mounting holes tied to GND. We duplicate the pattern on the adapter board so it's clear how to line up the two boards.

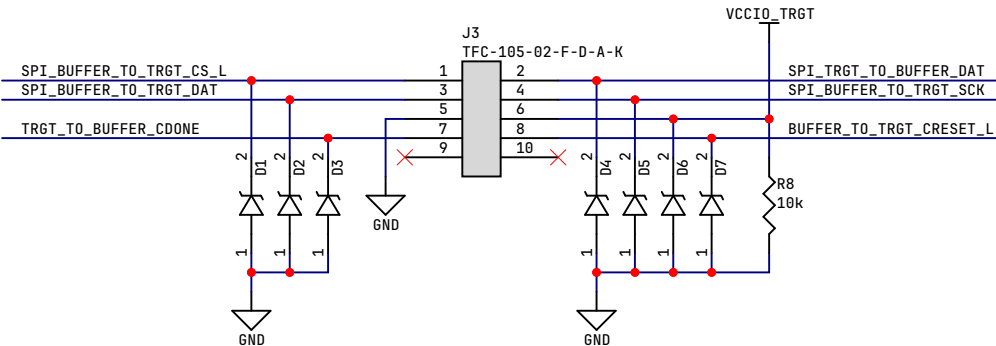


## iCEprog SPI Header

This board cheats and uses the target VSENSE pin to power the buffers instead of sensing and replicating the target IO voltage. We don't have time to design and test the voltage sense circuit now.

Because of this, we include a 3.32k bleed resistor on VCCIO\_TRGT. When the programmer is unplugged, the bleed resistor pulls VCCIO\_TRGT to ground and keeps the buffers off. When the programmer is plugged in, the bleed resistor draws 1 mA from VSENSE. If the programmer is hot-unplugged from a powered target, it will bleed VCCIO\_TRGT in less than 100ms.

All ESD diodes are UCLAMP3301P.TCT 3.3V unidirectional TVS diodes. Normally, we'd place these as close as possible to the connector pins, but we want to keep all the components on the top side of the PCB, so we place them by the buffer inputs instead.



## CRESET Notes:

In Oxide designs, the iCE40's CRESET\_L signal is typically controlled by an open-drain output. We don't want to connect CRESET directly to an FT232 GPIO pin. If the FT232 GPIO pin is high, and the programmer is plugged into a target that is held in reset because of a power fault, it will crowbar the CRESET line.

On Gimlet and Sidecar, the CRESET pin is driven by the open-drain output of a TPS3780A dual comparator and has a 10k pull up resistor.

On PSC, the CRESET pin is driven by the open-drain power good output from an NCV8164 LDO, and has a 10k pull up resistor on the target.

On Cosmo, the CRESET pin is driven by the open-drain power good output of a TPS386596L33 power supply supervisor, and has a 10k pull up resistor.

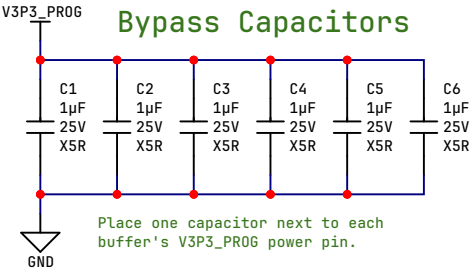
## Level Shifting Buffers

Data Sheet: [SN74LVC2T45 \(PDF\)](#)

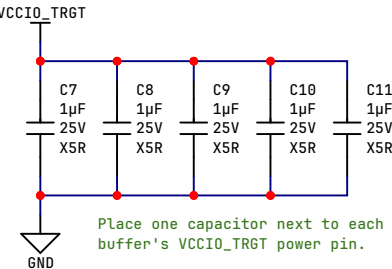
Table 7-1. Function Table (Each Transceiver)<sup>(1)</sup>

INPUT DIR	OPERATION
L	B data to A bus
H	A data to B bus

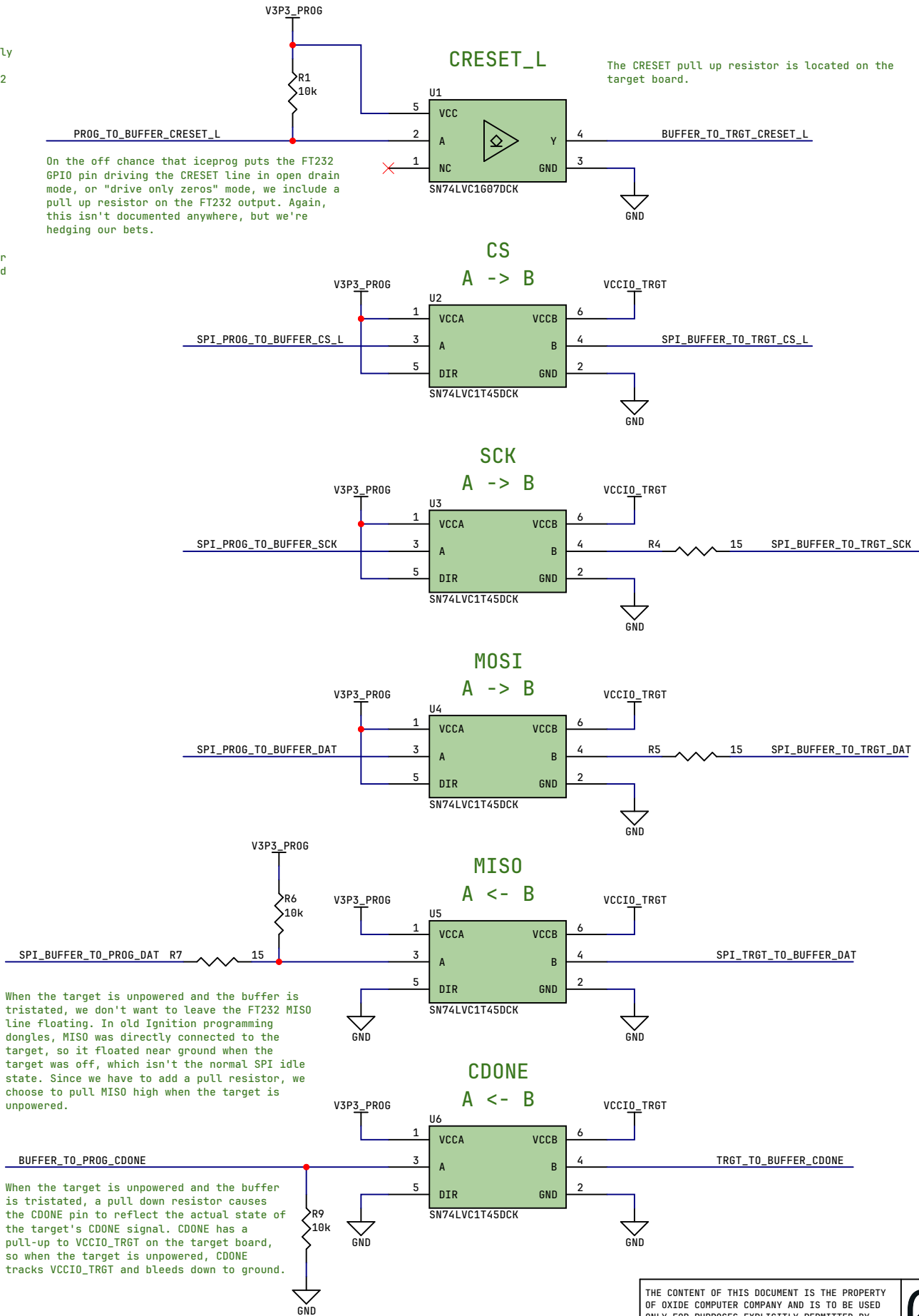
(1) Input circuits of the data I/Os always are active.



Place one capacitor next to each buffer's V3P3\_PROG power pin.



Place one capacitor next to each buffer's VCCIO\_TRGT power pin.



When the target is unpowered and the buffer is tristated, we don't want to leave the FT232 MISO line floating. In old Ignition programming dongles, MISO was directly connected to the target, so it floated near ground when the target was off, which isn't the normal SPI idle state. Since we have to add a pull resistor, we choose to pull MISO high when the target is unpowered.

When the target is unpowered and the buffer is tristated, a pull down resistor causes the CDONE pin to reflect the actual state of the target's CDONE signal. CDONE has a pull-up to VCCIO\_TRGT on the target board, so when the target is unpowered, CDONE tracks VCCIO\_TRGT and bleeds down to ground.

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**Oxide**

BOARD NAME: ignition-adapter.PrjPcb  
DWG NO.: 913-xxxxxxx

TITLE: ignition-adapter.SchDoc

SIZE: 17x11  
DATE: 8/29/2025  
CAGE #: 9B223  
REV: 1  
SHEET: 1 OF 1