U1
Teensy4.1

VUSB
VIN (3.6v to 5.5v)
GND
3V3 (250mA max)
23_A9_CRX1_MCLK1
22_A8_CTX1
21_A7_RX5_BCLK1
20_A6_TX5_LRCLK1
19_A5_SCL0
18_A4_SDA0
17_A3_TX4_SDA1
16_A2_RX4_SCL1
15_A1_RX3_SPDIF_IN
14_A0_TX3_SPDIF_OUT
13_SCK_CRX1_LED
GND
41_A1_MIS01
40_A16_CS1
39_DAT2_TX5
38_DAT3_RX5
37_CMD_SCK2
36_CLK_CS2
35_DAT0_MOSI2
34_DAT1_MISO2
33_MCLK2

GND
0_RX1_CRX2_CS1
1_TX1_CTX2_MISO1
2_OUT2
3_LRCLK2
4_BCLK2
5_IN2
6_OUT1D
7_RX2_OUT1A
8_TX2_IN1
9_OUT1C
10_CS_MQSR
11_MOSI_CTX1
12_MISO_MQSL
3V3
24_A10_TX6_SCL2
25_A11_RX6_SDA2
26_A12_MOSI1
27_A13_SCK1
28_RX7
29_TX7
30_CRX3
31_CTX3
32_OUT1B

R−
GND
T+
T−
LED
R+
Ethernet

ON_OFF
PROGRAM
GND
3V3
VBAT

Device USB
D−
D+

Host USB
5V
D−
D+
GND
GND

GND

GND
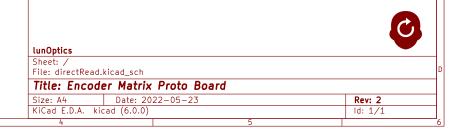
The matrix can be extended depending on the
number of available processor pins. Theoretically,
some 190 Encoders can be attached to a T4.1

ENC1 ENC4 ENC7 ENC10 ENC13
ENC2 ENC5 ENC8 ENC11 ENC14
ENC3 ENC6 ENC9 ENC12 ENC15

AR0 BR0 SR0
AR1 BR1 SR1
AR3 BR3 SR3

C0 C1 C2 C3 C4

Connections to the contoller are compatible to all
ARM Teensy boards

Changes:
V2: Fixed missing GND connection to encoder
V2: Fixed reversed pin names SRn <−> BRn

lunOptics
Sheet: /
File: directRead.kicad_sch
Title: Encoder Matrix Proto Board
Size: A4   Date: 2022−05−23   Rev: 2
KiCad E.D.A. kicad (6.0.0)   Id: 1/1