AC_Input

AC+D

NEMA C6 receptical for
use with C5 cables
with angled and
international plugs

Chassis_Shield   AC−D

Spec: IEC 60320 C6
File: input.kicad_sch

GNDPWR

LED_Driver_AC−DC

DIM   +3V3   FAULT

AC+   DIM   3V3D   FAULT   DC+D

Isolated offline flyback converter to drive LED with constant
current at varying current levels for dimming

AC−   DC−D

Spec: 90−277 VAC Input, 30−50 VDC Output, Constant Current, Dimmable
File: ac−dc.kicad_sch

Polarity_Switch

DIR_A   DIR_B

IN+   DIR_A   DIR_B   OUT_AD

Selectable polarity
reversing switch to
account for LED
installation polarity

IN−   OUT_B

Spec: 1 Amp Minimum
File: polarity−switch.kicad_sch

LED_Holder

LED_A

Tool−less, user servicable
LED fixture for <30W,
13.5x13.5mm size
LED chip−on−board (COB)

LED_B

Spec: LED Size 13.5x13.5mm
File: led.kicad_sch

Microcontroller

DIM   FAULT   DIR_A   DIR_B

DIM   FAULT   DIR_AD   DIR_BD

SCLD
SDA

Low−level microcontroller for
reading capacitive sensor and
determing LED orientation,
setting drive current and
polarity accordingly

Spec: RP2040
File: mcu.kicad_sch

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qwiic connector

https://www.sparkfun.com/qwiic

GND   GND1

4   4
3   3
+3V3   2   2
1   1
GND   J5 J2

Capacitive_Touch_Sensor

SCL   Capacitive strip sensor for adjustable
SDA   brightness user input and power on/off
3V3
GND_remote

https://github.com/BelaPlatform/Trill
Spec: CY8C206X6A
File: capacitive−touch.kicad_sch

H1   H2

GNDPWR

RV1 620V
AC+ HV   AC- HV
B82731H2701A030 FL1
C1 0.1u
AC_EMI+ HV   AC_EMI- HV
2 1
3 4
L1 WE-TI_1014
AC_Filter+ HV
D1 CD-DF406SL
GNDPWR

VHV HV
C2 0.22u
GNDPWR
VINSENSE
R10 1M
R23 3.48k
GNDPWR
R1 500k
D8 BAV20
VIN
C3 10u
GNDPWR
D5 BAV20
R5 150
C21 4.7p
R7 10k
DCM
R3 200k
R4 9.31k
GNDPWR
FB
C9 47p
GNDPWR

D3 SMBJ170A-13-F
R32 100k
FREEWHEEL HV
D4 CMR1U-10M TR13 PBFREE
DRAIN HV
GATE
Q1 IGLR65R200D2
SENSE
R8 30m
GNDPWR
C20 2.2n

T1 750817251
N1
PRIMARY_TIE HV
1 3
N3
11
9
N2
4
10
N4
5
N5
6
8
GNDPWR

C4 0.47n
U2 MP9989GV-Z
R2 300
1 VDD   VD 8
2 SENSE VD 7
3 VS   VD 6
4 VS   VD 5
DC+
C23 10u   C10 330u   C11 330u   R27 20k   D9 SMBJ48A-13-F
DC-

U1 LT3799EMSE-PBF
DIM CTRL2 1 CTRL1   EPAD EPAD
CRTL3 2 CTRL2   VIN_SENSE 16 VINSENSE
       3 CTRL3   SENSE 15   SENSE R25 20
VREF   4 VREF   GATE 14   GATE
*FAULT 5 *FAULT   INTVCC 13
       6 CT   NC 12
C7 10n 7 COMP+   VIN 11   VIN
C6 10n 8 COMP-   DCM 10   DCM
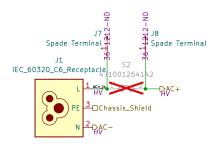   FB 9   FB
GNDPWR
GNDPWR
C8 4.7u
GNDPWR

VREF
R18 100k
FAULT
FAULT

R26 100k
CTRL2   VREF
JP2 SolderJumper_2_Bridged
CRTL3

U3 LMR36006BRNXT
VIN
C27 0.47u   C28 0.47u
GNDPWR
10 VIN   BST 4   BST
2 VIN   SW 12   SW
9 EN   NC 3
1 PGND   PG 8   CTRL2
11 PGND   FB 7   3V3_FB
5 VCC   AGND 6
GNDPWR
VCC
C29 1u
GNDPWR

C30 100n
L2 33u
3V3
C32 10u C33 10u C34 0.47u D2 3.425
GNDPWR
R19 100k
C31 20p   R20 43.2k
GNDPWR

IN+

10k
R15
U5
ISOM8118DFHR

R6
100k

R11
100k
D7
15v

U4
FDMQ8205A

R12
R

U6
ISOM8118DFHR
10k
R16

DIR_A

1   4
2   3

R9
10k
D
D12

D6
15v

OUT_A

6   S2   S3   8
3   S1   S4   10
13   D1/2 D3/4 16   OUT_B
4   G2   G3   9
1   G1   G4   12

D11
15v
R14
R

D
D13
R13
R

4   1
3   2

DIR_B

GND IN−

D10
15v

GND

J6
2601-3102

LED_AD —1— 1.1   1.2 —2—
LED_BD —3— 2.1   2.2 —4—

D14
LED

J7
Spade Terminal

J8
Spade Terminal

36 1212-ND

36 1212-ND

J1
IEC_60320_C6_Receptacle

S2
471001264142

L   1 AC+_In
         HV

PE   3 Chassis_Shield

N   2 AC−
         HV

DAC+
HV

+1V1 +3V3
Place 1uF close to RP2040 pin 44

C12 100n C5 1u C15 1u C16 100n C17 100n C22 100n C24 100n

GND GND

S1
435171014816
1k R33

GND

+3V3
R34 27.4
26 RUN
TP1
USB_DP_In USB_DP
USB_DM_In USB_DM
TP2
27.4
R35
QSPI_CS 56 QSPI_SS

+3V3
U9
AT25xxx
C25 100n
QSPI_IO2 3 WP VCC 8
QSPI_IO3 7 HOLD SCK 6 QSPI_CLK
QSPI_CS 1 CS MOSI 5 QSPI_IO0
GND 4 MISO 2 QSPI_IO1

GND

QSPI_IO0 53 QSPI_SD0
QSPI_IO1 55 QSPI_SD1
QSPI_IO2 54 QSPI_SD2
QSPI_IO3 51 QSPI_SD3
QSPI_CLK 52 QSPI_SCLK

Y1
830070868 XIN
GND
33p C26
XIN 20 XIN
1 2 GND
3
XOUT_drive
33p C35
XOUT 21 XOUT
1k R29

GND

SWCLK 24 SWCLK
SWDIO 25 SWD

19 TESTEN

GND

+3V3
J3
Conn_ARM_SWD_TagConnect_TC2030-NL
VCC 1
RESET 3
R30 100
SWCLK 4 SWCLK_In
SWDIO 2 SWDIO_In
SWO 6
GND 5
100 R31

GND

45 23 1 48 43 44
VREG_VOUT DVDD IOVDD USB_VDD ADC_AVDD VREG_IN

GPIO0 2 SDA
GPIO1 3 SCL
GPIO2 4 PWM_DIM
GPIO3 5 FAULT
GPIO4 6 DIR_A
GPIO5 7 DIR_B
GPIO6 8
GPIO7 9
GPIO8 11
GPIO9 12
GPIO10 13
GPIO11 14
GPIO12 15
GPIO13 16
GPIO14 17
GPIO15 18
GPIO16 27
GPIO17 28
GPIO18 29
GPIO19 30
GPIO20 31
GPIO21 32
GPIO22 34
GPIO23 35
GPIO24 36
GPIO25 37

GPIO26_ADC0 38 TEMP_SENSE
GPIO27_ADC1 39
GPIO28_ADC2 40
GPIO29_ADC3 41

GND
GNDPWR 57
0 R28
U7
RP2040
GND

+3V3
R39 4.7k R40 4.7k
SDA SDA
SCL SCL

R36 10k R37 100k
PWM_DIM DIM
PWM frequency = 1907 Hz
C36 100n C37 10n
GND GND

+3V3
R38 R
TEMP_SENSE
TH1
Thermistor_NTC
1 J4
2 Conn_01x02_Pin
GND

CY8C20666A-24LQXI
U8

VCC
VCC

0.1u
C18

GND1
GND1

Pin	Label		Label	Pin	
21	VDD	P2[7]		2	
41	VDD2	P2[5]		3	
		P2[3]		4	
		P2[1]		5	
18	VSS	P4[3]	SENSE18	6	18 CS1R
47	VSS2	P4[1]	SENSE19	7	19 CS1S
49	Center_Pad	P3[7]	SENSE20	8	20 CS1T
		P3[5]	SENSE21	9	21 CS1U
		P3[3]	SENSE22	10	22 CS1V
		P3[1]	SENSE23	11	23 CS1W
26	XRES	(SCL)P1[7]	SENSE24	12	24 CS1X
		(SDA)P1[5]	SENSE25	13	25 CS1Y
		P1[3]	SENSE26	16	26 CS1Z

VCC

3V3

SCL   SCL
SDA   SDA

GND_remote

GND1

(PR/SCL)P1[1] — 17 — SCL — R17 100
(PR/SDA)P1[0] — 22 — SDA — R21 100
P1[2] — 23 — ADDR0
P1[4] — 24 — ADDR1
P1[6] — 25

Pin	Port	Sense	Pin	CS
27	P3[0]	SENSE1	1	CS1A
28	P3[2]	SENSE2	2	CS1B
29	P3[4]	SENSE3	3	CS1C
30	P3[6]	SENSE4	4	CS1D
31	P4[0]	SENSE5	5	CS1E
32	P4[2]	SENSE6	6	CS1F
33	P2[0]	SENSE7	7	CS1G
34	P2[2]	SENSE8	8	CS1H
35	P2[4]	SENSE9	9	CS1I
36	P2[6]	SENSE10	10	CS1J
37	P0[0]	SENSE11	11	CS1K
38	P0[2]	SENSE12	12	CS1L
39	P0[4]	SENSE13	13	CS1M
40	P0[6]	SENSE14	14	CS1N
44	P0[7]	SENSE15	15	CS1O
45	P0[5]	SENSE16	16	CS1P
46	(INT)P0[3]	SENSE17	17	CS1Q
48	(INT)P0[1]			

Pin	NC
1	NC
14	NC
15	NC
19	NC
20	NC
42	NC
43	NC

C19
2.2n

GND1

VCC

ADDR0

R22
47k

JP3
Jumper_3_Open

GND1

VCC

ADDR1

R24
47k

JP4
Jumper_3_Open

GND1

https://learn.bela.io/using-trill/all-about-i2c/

OSHW
G5
OpenSourceHardware_Logo

H3   H4   H5   H6