512-LED Matrix (64 columns by 8 rows)

COL 0 COL 1 COL 2 COL 63

D0 D8 D16 D504 ROW 0
D1 D9 D17 D505 ROW 1
D2 D10 D18 D506 ROW 2
D7 D15 D23 D511 ROW 7

ARDUINO PINS
A0 — D7
A1 — D6
A2 — D5
A3 — D4
A4 — D3
A5 — D2
A6 — D1
A7 — D0

To U4–U10 pin 2 for D1–D7 respectively.

+5V

C1 0.1µF

U3 TPIC6C595

R8–R23 as appropriate to limit LED current.
At +9V supply, <20 mA:
For 2.0–2.2 V LEDs (red, yellow): R=360Ω
For 3.0–3.2 V LEDs (white, blue, green): R=300Ω

SER_IN   VCC
SRCK   DRAIN0   COL 0
SRCLR   DRAIN1   COL 1
          DRAIN2   COL 2
RCLK   DRAIN3   COL 3
G   DRAIN4   COL 4
          DRAIN5   COL 5
          DRAIN6   COL 6
GND   DRAIN7   COL 7
          SER_OUT

R8
R9

Repeat for total of 8 blocks with U3–U10, C1–C8, R8–R23,
with inputs D1–D7, outputs to columns 0–63.

+5V

C0 0.1µF

+9V

R0 1K

May substitute e.g. IRF9530 FQP47P06
Q0

U0 74HCT238
ARDUINO PINS
A8 — SRCLK   R0
A9 — SRCLR   R1
A10 — G   R2
A11 — RCLK
A12
A13   REN
A14
A15

VCC
A0 Y0
A1 Y1
A2 Y2
    Y3
E1 Y4
E2 Y5
E3 Y6
GND Y7

U2 ULN2803A*
COM
I1 O1
I2 O2
I3 O3
I4 O4
I5 O5
I6 O6
I7 O7
I8 O8
GND

ROW 0

Repeat for a total of 8 outputs
for R0–R7, Q0–Q7, from pins
18–11 respectively, driving
rows 0–7.

*May substitute ULN2803C for ULN2803A. The pinouts
are compatible except the 2803C has two extra pins
at the bottom (10 & 11) which are not connected to anything.

ARDUINO PINS
0/RXØ
1/TXØ
2 3 4 5 6 7

ARDUINO PINS
8 9 10 11 12 13 AREF SDA1 SCL1

U1 ULN2803A
COM
L7 I1 O1 R24 D512 GREEN
L6 I2 O2 R25 D513 YELLOW
L5 I3 O3 R26 D514 YELLOW
L4 I4 O4 R27 D515 RED
L3 I5 O5 R28 D516 RED
L2 I6 O6 R29 D517 BLUE
L1 I7 O7 R30 D518 BLUE
L0 I8 O8 R31 D519 WHITE
    GND

+9V

R24–R31 as appropriate
for each LED value.

For 2.0–2.2 V LEDs (red, yellow) at +9V supply, <20 mA: R=360Ω
For 3.0–3.2 V LEDs (white, blue, green): R=300Ω

+5V

ARDUINO PINS
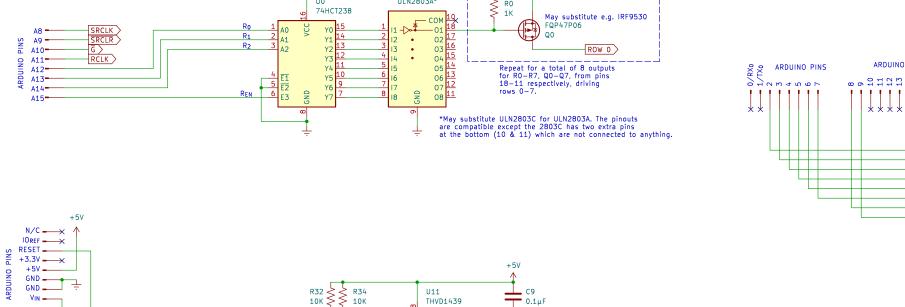N/C
IOREF
RESET
+3.3V
+5V
GND
GND
VIN

C10 10µF

J1 RESET DISABLE (Remove to program)

R32 10K   R34 10K   U11 THVD1439   C9 0.1µF   +5V

UART3
Tx 14
Rx 15
16
ARDUINO PINS
17
18
19
20
21

RO   VCC
RE   B
DE
DI   GND   A

R33 10K

J0 POWER / RS-485
1 A (D+ IN)
2 B (D- IN)
3 +9V IN
4 GND
5 GND
6 GND
7 B (D- OUT)
8 A (D+ OUT)
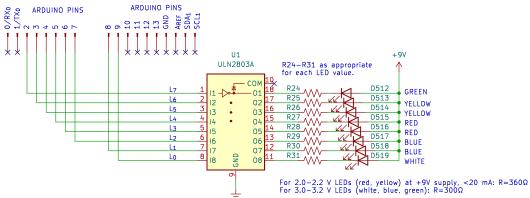
Insert terminating resistor here on last unit in chain.
RTERM 120Ω

64x8 LED MATRIX

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NOTICE The pin assignments for the Arduino controller are
different for this version of the board than on previous
versions with the Arduino detached. This requires a change
to the firmware image.

Sheet: /
File: matrix64x8_210.kicad_sch
Title: MATRIX 64x8
Size: USLedger   Date: 09-DEC-2023   Rev: 2.1.0
KiCad E.D.A. eeschema 7.0.6-0   Id: 1/1