Dot Matrix MAX7219 – LED green

Vcc

GND

10

11

9

VCC
GND
DIN
CS
CLK
MAX7219

Push buttons

Cars 1 2 3 4 5 Start

6x RCA
Panel jacks

Arduino
Mega2560 Rev3

8 7 6 5 4 3 2

Buzzer

MADE IN
ITALY

PWM

COMMUNICATION

TX
RX

ON

MEGA
Arduino
2560

POWER

ANALOG IN

DIGITAL

GND

Vcc to Dot Matrix

GND

330 ohm

GX164 - 4-Pin Male Aviation Panel Connector

GX164 - 4-Pin Female Aviation Cable Connector

100 uF 16V

DC jack 5.5 x 2,1 mm

Switch

DIN
DO
+5V
GND

3 x Strip 300 LED RGB WS2812B- NEOPIXEL

GND

ARDUINO PIN	DESTINATION / FUNCTION	CAR N°	CAR COLOR	NOTES
A0	NEOPIXEL STRIP DATA	–	–	Data signal for LED strip (use 330 Ω or 500 Ω series resistor as required)
GND	NEOPIXEL STRIP GROUND	–	–	Common ground for strip, Arduino, and power supply
+5V	NEOPIXEL STRIP POWER	–	–	Direct from power supply/DC jack (max 3A, use capacitor recommended)
3	BUZZER (AUDIO OUT)	–	–	Beeper/buzzer output
7	RACE BUTTON	1	RED	Red car button
6	RACE BUTTON	2	GREEN	Green car button
5	RACE BUTTON	3	BLUE	Blue car button
4	RACE BUTTON	4	WHITE	White car button
2	RACE BUTTON	5	YELLOW	Yellow car button
8	START BUTTON	–	–	Start/reset race
9	DOT MATRIX DIN	–	–	Data input (LED Matrix Display)
10	DOT MATRIX CS	–	–	Chip select (LED Matrix Display)
11	DOT MATRIX CLK	–	–	Clock (LED Matrix Display)

Construction notes — Open LED Race 900

Components & assembly
- Project uses ready-made electronic modules.
- Minimal soldering (buttons, power, LED strip).
- Dot matrix display can be connected via dupont/breadboard cables.

Enclosure & layout
- 180x140x70 mm box with transparent cover (electrical type).
- Sand cover with 400-grit paper for “frosted” effect.
- Holes needed:
  - 1 for DC jack
  - 6 for buttons
  - 1 for main switch
  - 1 for LED strip power jack
  - 1 for buzzer/sound output
- Display fixed inside with standoffs/brackets.
- Layout/images in “Images” folder.

Wiring & power
- Follow the provided wiring diagram exactly.
- Arduino Mega pins are software-defined.

A0 series resistor (LED data input)
- WS2812: 500 ohm
- WS2813: 330 ohm
- Always 1/4 W, tolerance ≤5%.

Power supply filtering
- 1000 µF / 16 V electrolytic capacitor on +5 V near DC jack or strip.

Power supply
- Single DC jack for Arduino, LED and matrix.
- Polarity: center positive, shell negative.
- Power supply: 5 V stabilized, min 3 A.

NeoPixel strip
- Data wire max length: 2 meters (for best reliability).

Note costruttive — Open LED Race 900

Componenti e assemblaggio
- Progetto basato su moduli elettronici già pronti.
- Poche saldature (pulsanti, alimentazione, strip LED).
- Il display dot matrix può essere collegato con cavetti dupont o breadboard.

Box e disposizione
- Scatola di derivazione 180x140x70 mm, con coperchio trasparente (tipo elettrico).
- Carteggiare il coperchio con grana 400 per effetto traslucido.
- Forature:
  - 1 per jack DC alimentazione
  - 6 per pulsanti
  - 1 per interruttore
  - 1 per jack alimentazione strip LED
  - 1 per l'uscita del suono del buzzer
- Display fissato all'interno con distanziali/staffe.
- Layout e immagini nella cartella "Images".

Connessioni e alimentazione
- Seguire attentamente lo schema di cablaggio fornito.
- Pin Arduino Mega definiti via software.

Resistenza su A0 (dato ingresso LED)
- WS2812: resistenza da 500 ohm
- WS2813: resistenza da 330 ohm
- Sempre 1/4 W, tolleranza ≤5%

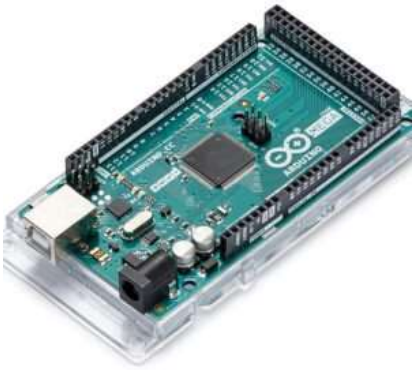
Condensatore sull'alimentazione
- Elettrolitico 1.000 µF / 16 V sul +5V, vicino al jack o ai LED.

Alimentazione
- Un unico jack DC per Arduino, LED e matrice.
- Polarità: centrale positivo, esterno negativo.
- Alimentatore: 5 V stabilizzati, almeno 3 A.

Strip NeoPixel
- Cavo dati max 2 m di lunghezza (migliore affidabilità).

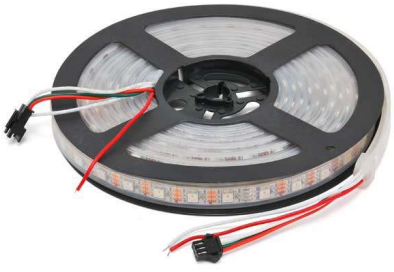
Bill Of Materials

1 x [DC supplyer 5v 3 A inner positve (5,5 x 2,1 mm)]

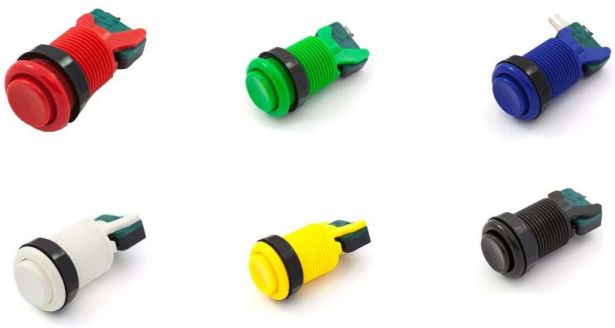


1 x [Arduino Mega2560 Rev3]

1 x [4 Display dot matrix 8×8 con MAX7219 – LED green]



3 x [Strip 300 LED RGB WS2812B- NEOPIXEL]



Arcade push-buttons:
Red
Green
Blue
White
Yellow
Black

Bill Of Materials

1 x [Microswitch]

1 x [Electrolitic capacitor 100 uF 16 V]

1 x [GX164 - 4-Pin Male Aviation Panel Connector]

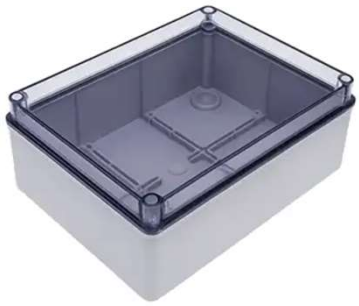
1 x [GX164 - 4-Pin Female Aviation Cable Connector]

6 x [RCAPanel jacks]

1 x [DC jack 5.5 x 2,1 mm]

1 x [Buzzer piezo]

Bill Of Materials



1 x [Junction Box 180 x 140 x 70
with transparent plain lid]

12 mt x [Cable 2x 0,25 mmq- 24 AWG]
For buttons external connections, 2 mt for each button.