Arduino Nano 33 BLE Pin Connections

Comprehensive Wiring Schematic & Interface Mapping Document

MAIN CONTROLLER	DC MOTOR DRIVERS	STEPPER DRIVERS	SENSORS & PERIPHERALS
Nano 33 BLE	2x BTS7960B	4x A4988	5 Modules

Complete Pin Wiring Map

TARGET COMPONENT	ARDUINO PIN	DIRECTION	MODULE TERMINAL	SIGNAL TYPE
BTS7960B DC Motor Driver #1	5V	→	VCC	Power (5V)
	GND	→	GND	Ground
	D2	→	R_PWM	PWM Output
	D3	→	L_PWM	PWM Output
	3.3V	→	R_EN	Enable (High)
	3.3V	→	L_EN	Enable (High)
BTS7960B DC Motor Driver #2	5V	→	VCC	Power (5V)
	GND	→	GND	Ground
	D4	→	R_PWM	PWM Output
	D5	→	L_PWM	PWM Output
	3.3V	→	R_EN	Enable (High)
	3.3V	→	L_EN	Enable (High)
A4988 Stepper Driver #1	3.3V	→	VDD	Logic Power
	GND	→	GND	Ground
	D6	→	DIR	Digital Out
	D7	→	STEP	Digital Out
A4988 Stepper Driver #2	3.3V	→	VDD	Logic Power
	GND	→	GND	Ground
	D8	→	DIR	Digital Out

TARGET COMPONENT	ARDUINO PIN	DIRECTION	MODULE TERMINAL	SIGNAL TYPE
	D9	→	STEP	Digital Out
A4988 Stepper Driver #3	3.3V	→	VDD	Logic Power
	GND	→	GND	Ground
	D10	→	DIR	Digital Out
	D11	→	STEP	Digital Out
A4988 Stepper Driver #4	3.3V	→	VDD	Logic Power
	GND	→	GND	Ground
	D12	→	DIR	Digital Out
	D13	→	STEP	Digital Out
Grove E-Ink Display 1.54"	GND	→	GND	Ground
	3.3V	→	VCC	Logic Power
	TX	→	RX	UART Serial
	RX	→	TX	UART Serial
2-Channel Relay Module	GND	→	GND	Ground
	A6	→	IN1	Control Signal
	A7	→	IN2	Control Signal
	5V	→	VCC	Module Power
KY-040 Encoder #1	GND	→	GND	Ground
	3.3V	→	+	Power (3.3V)
	A1	→	DT	Data Input
	A0	→	CLK	Clock Input
KY-040 Encoder #2	GND	→	GND	Ground
	3.3V	→	+	Power (3.3V)
	A3	→	DT	Data Input
	A2	→	CLK	Clock Input
LM393 Speed Sensor #1	GND	→	GND	Ground

TARGET COMPONENT	ARDUINO PIN	DIRECTION	MODULE TERMINAL	SIGNAL TYPE
	A4	→	OUT	Digital/Analog Signal
	3.3V	→	VCC	Power (3.3V)
	GND	→	GND	Ground
LM393 Speed Sensor #2	A5	→	OUT	Digital/Analog Signal
	3.3V	→	VCC	Power (3.3V)

System Notes & Hardware Considerations

- **Voltage Levels:** The Arduino Nano 33 BLE operates strictly at **3.3V logic level**. Ensure no 5V logic signals are connected directly to GPIO pins without level shifting.
- **Common Ground:** Ensure all module GND pins share a single common ground connection with the Arduino Nano 33 BLE.
- **Power Supply:** High-current drivers (BTS7960B motor drivers and A4988 stepper drivers) require external high-current power sources for motor power terminals (VM / B+ / B-), isolated from micro-controller logic supply.