BRAIN.DUINOBOT

DIGITALS PINS (IN/OUT)

This is using all pins as digital (even if they are analog)

Name	Pin #	Board Function	Other Functions	INT #
DIGITAL 0	0		USART1_RX	INT2
DIGITAL 1	1		USART1_TX	INT3
DIGITAL 2	2			INT0
DIGITAL 3	3	MOT_B_PWM	PWM	
DIGITAL 4	4	MOT_B_1		
DIGITAL 5	5		PWM	
DIGITAL 6	6		PWM	
DIGITAL 7	7			INT1
DIGITAL 8	8	MOT_B_2		
DIGITAL 9	9		PWM	
DIGITAL 10	10		SPI_SS	
DIGITAL 11	11		SPI_MOSI / ISP	
DIGITAL 12	12		SPI_MISO / ISP	
DIGITAL 13	13	Yellow LED	SPI_SCLK / ISP	
ANALOG 0	14	SENSOR 0		
ANALOG 1	15	SENSOR 1		
ANALOG 2	16	SENSOR 2		
ANALOG 3	17	SENSOR 3		
ANALOG 4	18	SENSOR 4		
ANALOG 5	19	SENSOR 5		
	20	MOT_A_1		
	21	MOT_A_2		
	22	MOT_A_PWM		
	23	BUZZER		
	24	BATT SENSOR		
	25	RUN_SW		

Digital I/O

- pinMode(pin, mode)
- digitalWrite(pin, value)
- int digitalRead(pin)

Advanced I/O

- shiftOut(dataPin, clockPin, bitOrder, value)
- unsigned long pulseIn(pin, value)

External Interrupts

- attachInterrupt(interrupt, function, mode)
- detachInterrupt(interrupt)

Interrupts

- interrupts()
- noInterrupts()

Communication

- Serial

ANALOG PINS (IN/OUT)

For **reading**, analog means a voltage value between 0-AREF.

Name	Pin #	Board Function
ANALOG 0	0	SENSOR 0
ANALOG 1	1	SENSOR 1
ANALOG 2	2	SENSOR 2
ANALOG 3	3	SENSOR 3
ANALOG 4	4	SENSOR 4
ANALOG 5	5	SENSOR 5
	6	Battery Monitor
	7	Temperature Sensor

For **writing**, analog means a PWM signal on that pin. Only implemented in pins with PWM noted. If that pin isn't associated with a hardware pwm, the value assigned will be HIGH if value > 127, LOW if lower. (all digital pins listed above are available)

Analog I/O

- analogReference(type)
- int analogRead(pin)
- analogWrite(pin, value) – *PWM*

ON BOARD PERIPHERICALS

SW

The switch wired to de MCU is available for reading on digital Pin 25. It's externally pulled low when pressed, so logic value is inverted. Note that the internal pull up must be enabled in order to avoid noise. This can be achieved using DigitalWrite(25,HIGH).

SWITCH PRESSED => LOW

SWITCH RELEASED => HIGH

BUZZER

There is a buzzer (without internal oscillator) located on Digital Pin 23. PWM can be used for generating different tones.

LED

A yellow LED is available for general porpoise on Digital Pin 13

H-BRIDGE (Motor Driver)

There is an on board Dual Motor Driver with PWM support the TB6612FNG. The driver is connected through the pins:

- MOT_A_1 (digital pin 20)
- MOT_A_2 (digital pin 21)
- MOT_PWM_A (digital pin 22)
- MOT_B_1 (digital pin 4)
- MOT_B_2 (digital pin 8)
- MOT_PWM_B (digital pin 3)

The following truth table (from IC's datasheet) explains the behavior

Input				Output		
IN1	IN2	PWM	STBY	OUT1	OUT2	MODE
H	H	H/L	H	L	L	SHORT BRAKE
L	H	H	H	L	H	CCW
		L		L	L	SHORT BRAKE
H	L	H	H	H	L	CW
		L		L	L	SHORT BRAKE
L	L	H	H	OFF (HI-Z)		STOP
H/L	H/L	H/L	L	OFF (HI-Z)		STAND BY

Since STBY is hard wired to High, only the upper values are possible