IO configurations(Min7) – stm32 High Density Device LQFP64

Compulsory and fixed pin assignments			
Pin name	Pin	Description	Usage
V_{SS_1}	31	V_{DD} = 2.0 to 3.6V(nominal 3.3V); V_{SS} = 0V Each pair 0.1uF decoupled Overall 1 uF decoupled	These pins are fixed and must be connected as shown.
V_{DD_1}	32		
V_{SS_2}	47		
V_{DD_2}	48		
V_{SS_3}	63		
V_{DD_3}	64		
V_{SS_4}	18		
V_{DD_4}	19		
V_{SSA}	12	V_{DDA} = 2.4 - 3.6V; Must be within ±0.3V of V_{DD}; ADC supply 0.1uF & 1uF decoupling	
V_{DDA}	13		
NRST	7	Reset input	
Boot0	60	Flash/Program select	
Boot1/PB2	28	Gnd (necessary???)	
PA9/UART1_TX /TIM1_CH2	42	For serial flash & debug printf(); Do not use for other purpose.	
PA10/UART1_RX/ TIM1_CH3	43		
V_{BAT}	1	Battery backup or V_{DD} (if not used)	
PD0/OSC_IN	5	Input only	
PD1/OSC_OUT	6	Output only	
Recommended pin assignments (Analog inputs)			
PC0/ADC123_IN10	8	Preferred analog input pins	gyro
PC1/ADC123_IN11	9		
PC2/ADC123_IN12	10		Sen_LF
PC3/ADC123_IN13	11		Sen_RF
PA0/TIM5_CH1/ADC123_IN0	14*	Next preferred analog input pins	Sen_LD
PA1/TIM5_CH2/ADC123_IN1	15*		Sen_RD
PA2/TIM5_CH3/ADC123_IN2	16*		Sen_Flash
PA3/TIM5_CH4/ADC123_IN3	17*		BatteryVolt
PA4/ADC12_IN4	20	Other analog inputs	
PA5/ADC12_IN5/SPI1_CK	21		
PA6/TIM3_CH1/ADC123_IN6/SPI1_MISO	22*		
PA7/TIM3_CH2/ADC123_IN7/SPI1_MOSI	23*		
Recommended pin assignments (Encoder inputs)			
PC6/TIM8_CH1	37	Quadrature i/p	
PC7/TIM8_CH2	38		
PB4	56	Quadrature i/p. Remap TIM3 here.	
PB5	57		
PB6/TIM4_CH1	58	Quadrature i/p	Right_chA
PB7/TIM4_CH2	59		Right_chB
PA15	50	Quadrature i/p. Partial remap TIM2 here	Left_chA
PB3	55		Left_chB
Recommended pin assignments (Serial comms)			
PB10/i2c2_SCL/USART3_TX	29	I2C2 or USART	
PB11/i2c2_SDA/USART3_RX	30		
PC10/UART4_TX	51	RS232	
PC11/UART4_RX	52		
PC12/UART5_TX	53	RS232	
PD2/UART5_RX	54		

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Recommended pin assignments (PWM)			
PC8/TIM8_CH3	39	Remap TIM3 here for PWM o/p. If TIM3 is already assigned for quadrature i/p, do not use these pins.	
PC9/TIM8_CH4	40		
PA8/TIM1_CH1	41	PWM output	Rmotor_pwm
PA11/TIM1_CH4	44		Lmotor_pwm
PA0/TIM5_CH1/ADC123_IN0	14*	Can be used for PWMs or Analog inputs. TIM3_CH1 & TIM3_CH2 can be used for encoder inputs Pins marked with '*' are also listed before in other entries. They are repeated here for convenience. Do not use the same pins twice.	
PA1/TIM5_CH2/ADC123_IN1	15*		
PA2/TIM5_CH3/ADC123_IN2	16*		
PA3/TIM5_CH4/ADC123_IN3	17*		
PA6/TIM3_CH1/ADC123_IN6	22*		
PA7/TIM3_CH2/ADC123_IN7	23*		
PB0/TIM3_CH3/ADC12_IN8	26		
PB1/TIM3_CH4/ADC12_IN9	27		
General IOs and misc.			
PC4/ADC12_14	24	Analog input or general IO	Rmotor_dir
PC5/ADC12_15	25		Lmotor_dir
PB12/USART3_CK	33	Use these pins for HCMS2905 alphanumeric display SPI interface or general IOs.	Disp_CE
PB13/SPI2_CK	34		Disp_Clk
PB14/SPI2_MISO	35		Disp_RS
PB15/SPI2_MOSI	36		Disp_Data
PA12	45	Preferred general IOs (these pins have no special alternate functions that is useful)	Led0
PA13	46		Led1
PA14	49		Led2
PB8/TIM4_CH3	61	If TIM4 is used for encoder, these pins can be used for general IOs.	TX_Diag
PB9/TIM4_CH4	62		TX_Diag_H
PC13	2	Preferred general IO. These 3 pins have low current drive (3mA). Cannot drive LEDs.	Tx_Left
PC14	3		Tx_Right
PC15	4		User-SW

Notes:

1. 2 advance control timers (TIM1, TIM8), PWM, i/p capture, output compare, & quadrature encoder
2. 4 general timersTIM2, TIM3, TIM4, TIM5 – i/p capture, output compare, one pulse mode o/p, PWM, quadrature encoder
3. 2 basic timers, TIM6, TIM7 for interrupts.
4. Total I_{VDD} < 150mA. Individual IO pin can sink or source +/- 8mA, and sink 20mA (with a relaxed V_{OL})
5. Individual output pins can be configured as push-pull or open-drain.
6. Some alternate function pins can be remapped through AFIO_MAPR register. Refer to section-8 of stm32F10xxx reference manual.
7. Maximum of 16 interrupt pins, EXTI0-EXTI15. Can be mapped to any corresponding port pin. E.g. EXTI0 to (PA0/PB0/PC0/…). See section-9 of stm32F10xxx reference manual.
8. The IO subsystems pins available are limited by the 64 pin package. The 100-pin or 144 pin package allows more of the pins to be available.
9. Most pins are 5V tolerant, except ADC input pins, PB5 & PC13-PC15, OSC_IN
10. OSC_IN & OSC_OUT can be connected to a crystal to generate a more accurate clock for CPU